FEMALE WORK PARTICIPATION RATE AND CHILD MORBIDITY IN DHUBRI DISTRICT OF ASSAM.

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ABSTRACT

Survival of infant and child mortality in Assam has been a big problem. With poor educational facilities and inadequate health services infant and childhood mortality/morbidity has been a crisis for Assam. Among all the districts in Assam, Dhubri district recorded the highest number of infant and child mortality over the last few decades. However, one of the basic structures that have changed in the families of Assam is growing number of women in the labor force. From the empirical studies, it has been stated that there exists a positive relationship between female work participation rate and child mortality/morbidity. This may be because of less attention and less care by the mother to their child which ultimately leads to lower survival rate.Thus it is necessary to assess the impact of the relationship between female work participation rate and child morbidity. This paper aims to re-examine the relationship between female work participation rate and childhood morbidity in Dhubri district of Assam, where the highest number of infant and child mortality prevails.

key words- female work paricipation rate, infant mortality, child mortality, child morbidity, child care.

Introduction

Traditionally women are always associated with household activities, where they are expected to cook for the family, look after their children, caring the sick and elderly people along with other household activities. All these services confined to the care sector are often unpaid. Women, working in the household farm often work without remuneration. Similarly in urban areas, women who work for home based activities used to get a very low remuneration or often remain unpaid. In a patriarchal society like India, women are generally responsible for domestic and reproductive work. Mother's role in the development of the child is very important than any other person in the family because mother usually spend much more time with her child. Hence for the overall and all round development of the child, mother's role plays a key role in the family because it is the mother who provides all the basic necessities to her children.

With urbanization, industrialization, globalization and other related developments, many employment opportunities for females have been created. As a result, the female work participation rate has increased over the past decades in various populations. The Census of India has shown that FWPR has increased from 12.11% in 1971 Census to 22.27% in 1991 Census and further it increased to 25.5% in 2011 Census.

However, it is observed that working mother who are involved in income generating activities is a mixed blessing because it not only increases the income of the family but also reduces the amount of time available for child care at the same time. Therefore, increasing female work participation rate over the decades brings attention to the questions associated with the relationship between women's employment and childmorbidity rate as women's employment status has potential implications for various aspects of child's growth and development including health and nutrition.

However, no doubt the maternal employment improves the household accessibility to income, it may have some negative effects on the health and survivability of their children. The reason for this is the limited amount of time for child care by the working mothers. Because of the wide range of responsibilities both within and outside the home, it is generally difficult for an employed mother to fulfill the role of providing adequate care to their children. Hence because of this the employed mothers have to depend upon others in order to take care of their children. Moreover the quality of care and supervision provided by the substitute caretakers may not be adequate enough for the child. Also, it may not be possible for the low paid employed

mother to arrange for a substitute caretaker for the child on behalf of them. In this regard, women's employment may have some negative effects on the child's health and survivability through poorer supervision. As a result, for employed mothers, there is a high chance or possibility of having a malnourished child or children suffering from many diseases etc. as compared with the non-employed mothers because they don't have the time constraint and they can afford to devote enough time to their children. Non-employed mother mostly try to satisfy their children's needs as compared to working mothers.

Hence, it is of outmost importance to view the relationship between maternal employment and its impact on the child morbidity/ health problems of children.

Objective –

1. To access the impact of maternal employment on health problems (child morbidity) of children under 5 years.

Data Source And Methodology.

The present study is primarily based on survey method. However, to frame the background of the study, relevant secondary data are collected from Census of India, NFHS, Annual Health Survey, SRS and Statistical Handbook etc.

The primary data are collected through survey method. The sampled mothers are interviewed with the help of questionnaire i.e., designed in a manner to provide relevant information that are required keeping in view the objective of the study.

The objective of the proposed study is analyzed by using percentage and chi- square test, with the following Hypothesis.

Ho: There is no significant relationship between mother's employment status and child morbidity.

H1: There is a significant relationship between mother's employment status and child morbidity.

Sampling Design.

Dhubri have 5 Revenue Circles, viz, Dhubri Revenue Circle, Golokganj Revenue Circle, BilasiparaReveneu Circle, Agomoni Revenue Circle and Chapar Revenue Circle. Out of these Revenue Circles, Dhubri Revenue Circle and Bilasipara Revenue Circle were selected randomly.

Profile Of The Study

Dhubri district came into existence in the year 1983. It covers an area of 2,838 Sq.kms. It is located between 89.42 to 90.12 degree east longitude and 26.22 to 25.28 degree north latitude. The district is surrounded by West Bengal and Bangladesh in the West Goalpara and Bongaigaon district of Assam Garo Hills District of Meghalaya in the east,Kokrajhar district in the north, Bangladesh and state of Meghalaya in the south. Dhubri possess a rich Archeological and Cultural heritage.

Table 1.1: Occupational Background Of The Sampled Mothers.

Mother's occupation	Total Number (N=209)	Percentage
Housewife	79	37.8
Agriculture	34	16.3
Casual Labor	43	23.6
Service	21	10
Manual	32	15.3
Total	**209**	**100**

Table 1.2: Health Problems Of Children (Child Morbidity) Of Employed And Non-Employed Mothers.

Health problems	Children of employed mothers	Children of non-employed mothers	Total (N= 209)
(i)	**(ii)**	**(iii)**	**(iv)**
Yes	**30.7**	**69.3**	**100**
No	**99.3**	**9.7**	**109**

(iv)=(ii)+(iii)

Types Of Health Problems Of The Children/ Child Morbidity-:

1. Fever.
2. Stomach pain.
3. Ear pain.
4. Diarrhoea.
5. Jaundice.
6. Chicken Pox.
7. Skin Allergy.
8. Asthama**.**

Chi-square= 82.59(***)

Table 1.3: Result of chi-square test for the relationship between Mother's employment status and health problems of child/child morbidity in Dhubri district.

Health problems of children/Child morbidity	Maternal Employment Status		Pearson Chi-Square Value	Degrees of Freedom
	Employed mothers	Non-employed mothers		
Yes	30.7	69.3	82.59	1
No	99.3	9.7		

*** Significant at 1% level.

Source-: Field Survey.

Conclusion

The primary focus of the paper was based on whether or not female work participation rate can be seen to have an adverse impact on childhood morbidity inDhubri district as Dhubri district has the highest number of infant and child morbidity rates as per the secondary sources. The results discussed in depth above have ultimately shown that there is a significant relationship between employment status of a mother and childhood morbidity. Therefore, the alternative hypothesis which states that there is a significant relationship between mother's employment status and child morbidity in Dhubri district of Assam is accepted here. Thus, it means that female work participation rate has an impact on child morbidity in Dhubri district of Assam. However, child morbidity in Assam is also affected by other factors viz. biological factors, environmental factors, demographic factors and other socio-economic factors. Maternal employment plays only a part of it. Here, in this proposed study the respondents are mostly from the poorer section of the society where other factors like environmental and socio-economic factors plays a very important role for child morbidity in Dhubri district of Assam.

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INFERTILITY AMONG WORKING WOMEN: A CASE STUDY AMONG THE WORKING WOMEN UNDERGOING TREATMENT IN A PRIVATE HOSPITAL IN GUWAHATI CITY OF ASSAM

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ABSTRACT

Infertility is a very painful experience and it has a very significant impact on a female's life. Each and every aspect of a woman's life is affected by infertility andeven many infertile women face biases and barriers in their workplace. In most of the cases; infertility is often surrounded by silence and stigma. In the fear of being stereotyped, many women are reluctant to share their infertility experiences in workplace. This study throws light on the problems faced by infertile women in their workplace. The study is based on case study of 21 infertile women who are currently working. The data is collected from the women undergoing treatment in Dispur Polyclinic Hospital of Guwahati city of Assam. "Courage does not always roar. Sometimes courage is the little voice at the end of the day that says I'll try again tomorrow" Marry Anne Radmachar

Keywords: *Female infertility, infertility treatment, occupation, workplace.*

Introduction

Child bearing and rearing of child is considered as one of the most important endeavors in every human's life. A family is not complete without a child. As Notman pointed out in 1990, "Reproduction is perceived as a milestone in adult development."

But, on the other side of the coin, the problem of infertility is growing rapidly. WHO reports, one in every four couples in developing countries is affected by infertility. (Boerma T, Flaxman SR, Mascarenhas MN, Stevens GA, 2012,vanderpoel S,). In many developing countries, this problem is not addressed well. Infertility may have devastating consequences although it is not a life threatening issue. So, with the passage of time, this problem is gaining attention from social scientists and researchers in recent times. Infertility may lead to different psychological problems affecting a significant segment of the society.

In general, infertility is defined as the inability to conceive after one year of unprotected sex.

Infertility is not only a medical problem that requires medical intervention, but it is also a social problem since women are pressurized by social attitudes and cultural values. In a highly patriarchal society like India, women have to suffer from the brunt of social and psychological consequences of being infertile. Exclusion, rejection and stigmatization are not only common in social functions and ceremonies but also in workplace. Infertile women suffer from teasing and taunting in workplace also.

The inability to conceive a child is a stressful situation. The consequences of infertility are manifold. It includes societal repercussions and personal sufferings.

Literature Review

A review of literature helps the researcher to have a better understanding of the subject matter and to know the current advances that taken place in this field.

Some of the literature reviewed are-

According to,KLock SC Parry DC, Shinew KJ and (2004), infertile women often feel misunderstood particularly, in situations like baby showers, the infertile women feel uncomfortable as such situations reminds them their infertility and as a result relationship with friends, family and spouse may be strained.

As studied by, Inhorn, (1994), Kielmann(1998) and Sundby (1997), although infertility is a purely medical phenomena but in most of the countries it is found that, infertility and reproduction is center for social, political and economic analysis. The social attitude towards infertile women varies from society to society and from country to country. In western countries, psycho-social and economic repercussions are generally less severe but in developing countries like India, the social and economic reasons for having children are prominent.

Griel in 1991 pointed out that, the problem of infertility leads to psychological distress

among infertile women. The majority of the couples get totally surprised after knowing their infertile status.

The inability to conceive leads to distress and coping with their distress is associated with resources and roles. Thoits in 1999 reported that, blocked identity or role will result in more stress and leads to identity crisis.

Mc Quiillam conducted a study in 2003 on 580 Midwestern women. The study revealed that, satisfying role occupancy, especially marriage and employment helps to combat stress level. Women with a advantageous role accumulation, better educational background and better income have lower level of distress.

Kamala in 1990, said that, many infertile women suffer from feeling of vacuum, in spite of having all luxuries and comfort in life.

William in 1997 conducted a study and found that, infertile women suffer from a sense of worthlessness and inadequacy, stress and anxiety, lack of self control, anger and resentment, grief and depression, envy of other mothers, loss of dream and a sense of isolation.

In a structural equal modeling study in 1992, Andrew and Halman found that, infertility has negative effects on internal control and interpersonal conflicts.

As pointed out by Triparthi Niharika in 2008, infertility is a threat to women's identity, status and economic security. An infertile woman is not only stigmatized in the family and in home, but she is also boycotted from various auspicious social occasions.

Objective of the Study

The main purpose of the study is to explore and provide better insight into how infertility affects the day to day lives of working women. This study attempts to understand the social, marital and working experiences of those infertile women who are employed.

Methods: The current study took a qualitative transcendental phenomenological approach.

The phenomenon being explored was the experience of infertility, especially how it affects the relationship of the infertile women with her partner, with their family member, with neighbors and with colleagues.

This study is based on the definition of infertility given by World Health Organization which defined infertility as the failure to achieve pregnancy after 12 months or more of regular unprotected sexual intercourse.

The study included 24 participants. All are females ranging in the age group 25-45 years. All the participants are primarily infertile and are working. The participants were interrogated through a face-to-face interview with the help of a questionnaire. The questionnaire contained open-ended questions. The questions were mainly related to the role and daily occupation of the participants and their relation with colleagues, and with their partner. Information was also collected on background demographic variables. The interview took place in two phrases. In the first phase, there was face to face interaction and in the second phase, the participants were interacted through phone calls. Three of the participants conceived before the second phase of the interview and therefore, they were excluded from the study.

Results

Demographic background of participants:

Information was collected on demographic variables like, age of the respondents, their place of residence and their occupational status.

Table: 1 Demographic profile of participants:

No	Age	Place of residence	Occupation
1	25	Rural	Teacher in a primary school
2	28	Urban	Graphic designer
3	29	Rural	Runs a shop
4	30	Urban	Telecalling executive
5	31	Urban	Finance officer
6	31	Rural	Teacher in govt school
7	32	Urban	Assistant professor in a private college
8	32	Rural	School teacher
9	33	Urban	Junior administrative assistant
10	33	Rural	Private school teacher
11	33	Urban	Makeup artist
12	35	Rural	Senior administrative assistant

13	36	Rural	Nurse
14	36	Urban	Office assistant
15	37	Urban	ENT specialit
16	37	Urban	Ph. D co-ordinator
17	37	Rural	School teacher
18	38	Urban	Chartered accountant
19	39	Urban	Dentist
20	41	Urban	Lawyer
21	41	Rural	Assistant professor in a govt college
22	43	Urban	Teacher in a junior college
23	45	Urban	Teacher in a high govt high school

Majority of the participants are from urban area. Out of 23, 14 are from urban area and 9 are from rural area. Eleven participants are working in government organizations, 3 of them are business women and rests of the participants are working in private organizations.

Most of the participants are in the age limit 30-40. Four participants are above 40 years. The reasons for infertility of the participants included- Polycystic Ovary Syndrome, poor ovarian reserve, thyroid, endometriosis, uterine polyps and ovarian failure. 5 of the participants on the other hand, experienced infertility due to the medical complications of their male partners. The reasons of infertility of their male partners are related to low sperm quality and mobility.

Findings and Analysis

Though few participants reported that, infertility has no influence on the relation with colleagues, friends and family but, majority of the participants felt that, infertility affected almost every aspect of their lives.

The responses of the participants resulted in four themes. These themes are- impact of infertility on the occupation, impact of infertility on family relations and impact of infertility treatments.

Impact of infertility on the occupation

Majority of the participants reported that, the thought of being infertile is always in their mind. Even while talking with their colleagues, they remain conscious all the time and always try to avoid conversations related to kids and pregnancy.

Most of the infertile women are reluctant to share their experiences of infertility in workplace due to the stigma associated with it. Infertile women often face biases in workplace.

Participant 18 said that, “The experience of infertility is very painful. But it is a personal problem. I don’t discuss the problem with my boss, colleagues and friends. Because, discussing this matter with them, is like opening a window into the most intimate parts of my life.”

Participant 12 said that “I feel sad all the time. I don’t want to go to work, don’t want to make conversation with colleagues and don’t want to see people who are pregnant. I feel jealous and hurt if any of my colleague or friend becomes pregnant. I don’t have any close friends in office with which I can discuss my problems. I don’t trust anyone. I feel that, they will laugh at my back instead of supporting me.”

Participant 22 said that, “I feel inferior to my colleagues who already have kids or who are pregnant.”

Participant 15 said that, “I take so much care of myself. I follow a healthy diet, lead a healthy life style but still I am unable to get pregnant. On the other hand, I know many women in my workplace, who are so carefree and unhealthy but still have a baby. So, it seems very unfair and frustrating”

Participant 16 reported that, “It is emotionally difficult to be around children and pregnancy related things. So, I distanced myself from my colleagues. I don’t go to baby showers and birthday parties of their kids. I don’t want to do any interactions with others and don’t want to talk about my infertility struggles.

Participant 17 said, “I feel that, I need to spend more time on self care but due to the tight work schedule, I could not devote time for that. I could not even reduce my weight which is a major hurdle for achieving pregnancy as diagnosed by the doctor.”

Participant 13 said that, “I know that, my work stress is another hurdle in taking self care, but

still I cannot leave my job as financially I am not so strong and will have to depend on my partner for money."

Impact on family life

Infertility has affected the family relationships also. Sometimes, the working women feel more pressure as compared to housewives. After reaching home, they have to engage in household chores and have to take care of family members even if they are tired. As aresult, it is very difficult for them to take out time for self care. However, many times the women are being criticized, humiliated, abused and pressurized for being infertile. Sometimes, they are pressurized to leave their jobs and asked to stay at home which is another kind of discrimination. Sometimes, even if the problem is in the male partner, the women are ill-treated and held responsible for the situation. Decreased frequency of sexual intercourse and sexual dissatisfaction are some of the main problems among infertile couples. In some exceptional cases, it is also found that, infertile women are strongly supported by their partner and strengthen their bond.

Participant 4 reported, "Despite of my effort to be a good daughter in law for my in laws, I am criticized and insulted even for small mistakes"

Participant 5 said that, "I don't feel physical intimacy as exciting as earlier. Now a day, we do intercourse just as a regular routine in the hope that, it will lead to pregnancy."

Participant 23 reported that, "In spite of my problem, my husband supports me a lot; he tries to strengthen me emotionally. In fact, infertility brought us closer to one another.

Impact of infertility treatments

Managing the infertility treatments and the emotional pressure experienced by the infertile women highly impacted the everyday lives and roles of the participants.

Many participants are also facing problems due to the lengthy procedures of infertility treatments and the increased cost involved. The high cost and time consuming treatments are causing a challenge for them to pursue their career.

Participant 1 said that, I spent my entire savings on infertility treatments.

Participant 2 reported that, infertility has created more mental stress and affected my creative efficiency in work. Due to the lengthy procedure of treatment, I cannot focus on my work."

Participant 11 reported that, she had to sacrifice her career for taking the treatments as she needs more time to devote in treatments.

Many participants on the other hand, reported that they have to decrease their leisure activities and are not been able to spend time on hobbies and self care.

Participant 19 reported that, most of the time, the couple has to spend in hospitals as if they are patients. She said that, "I have to take regular medicines and if somehow, I forget to take the medicine, I panic."

Participant 21 stated that, "It is very depressing experience. My professional as well as personal life is affected a lot and I don't see any ray hope. Neither I enjoy doing anything nor do I have interest in any other activity. The feeling of not having a child constantly haunts me"

From the above findings, it is very clear that, infertility has devastating effects on major aspects of the lives of infertile women. They have lost self-confidence, feel inferior, suffer from feeling of grief which often leads to depression and frustration. Not only the personal life, but the professional life is also affected to a great extent. Many infertile women hesitate to share their infertility struggles with colleagues in the fear of being misunderstood.

Limitations of the study

The main limitation of this study is that, only infertile women are included in the study. Males experiencing infertility may have different experiences and perceptions. Furthermore, this study included only women in the age group 25-45. But, even infertile women above age 45 may also face similar experiences in the workplace.

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THE RESTORATION OF NATIONAL VALUES IS A KEY FACTOR IN PRESERVING THE FAMILY.

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Annotation: The article examines the problems faced by Uzbek families as a result of the negative spiritual impact of globalization. The author gives the legal foundations of the family in our country, the foundations of legal relations in it. The author classifies the main functions of the modern family. At the same time, he analyzed the causes of family divorces resulting from neglect of family values among young people. The article also reveals the meaning of the family in our national spirituality and sacred religion, as well as in the teachings of our great ancestors. The solution to this problem is shown.

Keywords: *negative impact on spirituality, family divorce, family responsibilities, legal foundations of the family, reasons for divorce, protection of the family by the state, family problems in national values, responsibilities to preserve the family.*

The era of globalization as a multifaceted process has brought changes to all strata of society. This process has led to positive changes in the world in the field of science, education and information technology development, international political and economic cooperation.

At the same time, it is time to mention the negative and sharp influence on the spiritual life of society, its national spirituality and to analyze the reasons for this influence from a scientific and theoretical point of view. Because at the present time, the resulting crisis situations in Uzbek families between spouses, mother-in-law and daughter-in-law, children and parents are linked to each other in a chain and lead to many family divorces.

The catastrophic consequences of the oil regulations are now assessed at the state level as a negative event in the spiritual and political life of the state. In his speech at the Youth Forum on December 26, 2020, the President of the Republic of Uzbekistan paid serious attention to this issue.

Our people have always considered the family sacred and have always treasured it. The stronger the family, the more stable the society. One thing must not be forgotten: peace in our homes, above all a healthy family environment, is directly related to the preparation of our daughters for family marriage, who are on the verge of an independent life.

“Unfortunately, as a result of our indifference and ignorance of this important issue, over the past 11 months of this year, 25,000 divorces have been registered among young families. This negative situation should cause serious concern and deep concern in all of us.

After all, think for yourself, 25,000 divorces - if there are at least three members in every family, isn't that the destruction of 100,000 lives ?! As a result, many innocent children become living orphans. How many human destinies will be confused and unsettled.1]

In this article, we will first try to consider the tasks, goals and legal foundations of the family from a scientific point of view and analyze the causes of the current crisis of the modern family. “The responsibilities of family law are to strengthen the family, build family relationships based on mutual love, trust and respect, solidarity, mutual assistance and be based on a sense of responsibility of all family members to the family, to prevent any person's arbitrary interference in family affairs, to ensure the unhindered exercise of their rights by family members and ensure that these rights are protected".[2]

Chapter XIV of the Constitution of Uzbekistan, entitled “Family”, reads: “The family is the basic unit of society and has the right to be protected by society and the state. A marriage is concluded only with the free and full consent of the future spouses".[3] Based on our legislation, the main functions of the family in society can be defined as follows:

First, one of the main tasks of the family is its reproductive function, and the purpose of creating a family is also related to this task. Every normal family should continue its offspring and raise healthy, versatile children for society, because this is how society

develops and generations complement each other.

Secondly, to respect the older generation, that is, to take care of parents in old age, to know about their condition and to make sure that they do not remain in need. "Adults, able-bodied children are obliged to take care of their parents." [4] The purpose of this challenge is to raise awareness of the human factor in society, especially to ensure the value of dignity and peace of mind in old age.

Third, every family must take care of their children, bring them up physically healthy, and also provide a future for their children, educate them or train them in a profession. To this end, "Parents are responsible for feeding and raising their children until they come of age. The state and society provide care, upbringing and education of orphans and children deprived of parental care, encourage charitable activities in the interests of children". [5] This will serve as a resource for training a new generation of social workers.

Also, the Family Code of the Republic of Uzbekistan "On the regulation of family relations in voluntary marriage, equality of personal and property rights of a husband and wife, the settlement of intra-family issues by mutual consent, raising children in a family, taking care of their well-being and maturity is based on the principles of priority protection of the rights and interests of minors. and disabled family members".[6] Equality of women and men in family relations. This means that family relations are the direct and joint responsibility of the husband and wife.

Fourth, the family should act as a base for their family members. Each member of the community interacts with a variety of professional, social, political and other people throughout the day. Returning to the family in the evening, they return home happy and happy, meeting good people, and sometimes, on the contrary, they come home from the street tired and tense. Then, if the family environment is friendly, supportive, family members will be able to solve the problem, even if they can create a comfortable environment, life problems for this person will be easily transient. On the contrary, the exacerbation of conflicts in the family leads to the alienation of family members from each other and the subsequent solution of their problems in other circles, regardless of the situation of the person who enters the house.

Fifth, the family is a part of society, a brick at its core. Educating the family means educating that society. The aforementioned speech of the President at the youth forum also shows that family divorce is a real threat to society.

Why is family depression increasing when family issues are clearly spelled out in our legislation? In our opinion, this problem is associated with a violation of the emphasis on family values in our national spirituality, great wealth, this is due to the wrong actions of a husband or wife in relation to each other and in some cases because of the mother-in-law's desire for domination in the family.

According to the analysis, the reasons for family divorce include:

First, as a result of the violation of the principle of "equality" in the national tradition of matchmaking, both boys and girls, and even their parents, build a family in order to receive more material benefits from each other through greed. As a result, if there is no material pleasure, they separate from each other, inventing various faults.

Secondly, young girls are sent to a "wealthy" family where they want, without any skills and knowledge. As a result, despite the fact that girls are in charge of household chores, their children's speech, illiteracy, dependence, weakness in raising children lead to the disintegration of their families.

Third, the bride or groom, who is an economically strong family, forget about issues of mutual respect and compromise in our family values, ignore the husband or wife, and sometimes reach the level of adultery.

Fourth, the groom or the bride, forgetting about the problems of family etiquette, honesty and fidelity, and even about the tears of their children, despite the fact that they become living orphans and they live in Sharia marriage with others, without a legal divorce from their a legally married family, that is, without legal dissolution of marriage, and they also have an illegitimate child.

Fifth, the number of cases of domestic violence in the family is growing. This situation is even more dangerous, as it leads to the woman's suicide, as a result of which her children end

up in an orphanage, and ultimately led to intense animosity between the two families and leading to intense hostility towards the father as the children mature.

Sixth, the intervention of a third party, in which the mother-in-law, father-in-law, brother-in-law, sister-in-law, even aunts, disturb the peace of the family, and also leads to the disintegration of the family.

Seventh, the inability of a man to work, his idleness, the burden of life, the fact that a man does not interfere with the material support of the family and shifts household chores onto the shoulders of a woman, also leads to the destruction of the family.

Eighth, the fact that parents send their daughters to men with two or three children from their first marriage, even to men who were not divorced from their first marriage, with a Sharia marriage without a legal marriage with their second wife, also forces men to divorce their family without respect for their family.

Ninth, in some families, the bride's primary responsibility is to accept her as the servant of the family and to demand unconditionally from her to fulfill the responsibilities assigned to her by all family members. In a new environment, a young bride, undergoing physiological changes, falls ill due to the fact that she cannot get enough sleep and eat well to complete these tasks. As a result, the family divorces, citing the bride's illness.

Tenthly, divorces occur in the families of women and men who have gone to work abroad, the reason for this is due to their betrayal, not caring for the family.

The above ten reasons do not apply to individuals and their families, but to the core of society as a whole, as well as to those who are close to them in society, for example, relatives of spouses, their descendants, husband and wife, orphans with living parents and newborns. children in a young family and, finally, the creation of hostility towards the children's own parents.

Such vices lead not only to the division of the family, but also to a split in society, the loss of mutual trust between people, the loss of respect for the family among young people, and the loss of respect for their parents.

In our country, all the necessary measures are being taken to prevent this evil in the laws and regulations of our state, in the adoption of bylaws on the restoration of the family, including the status of women, and their protection from violence. Over the past four years, 2 laws, 6 decrees and resolutions of the President have been adopted on this matter. For the first time, the Senate Committee on Women and Gender Equality was established. About half of the country's population - 17 million - are women. Ensuring their interests, strengthening their place in society is an important direction of the social policy of our state. In his message to the Oliy Majlis, the head of state proposed to create a Republican Public Council of Women. The Council was formed under the chairmanship of the Speaker of the Senate Tanzila Narbaeva. Currently, the Public Council is systematically working to increase the socio-political activity of women, support entrepreneurship, acquire knowledge and professional skills, help in finding a decent job, protect their health and resolve housing issues. The President said: "A system of incentives will be introduced for women who want to get higher education, have the ability and knowledge, but by the will of fate have not been able to fulfill their dreams. That is, girls in need who have lost one of their parents, single women without a breadwinner are reimbursed for the contract by the municipality and the university. This is a new system. Previously, we could not do this. Now is the time" - he stressed. [7]

These are just some of the opportunities that our state creates, which, of course, seeks to eliminate the aforementioned family divorces, to save the lives of children separated from their parents, but the solution to this problem is also associated with a change in the spiritual outlook of youth.

It is clear from our rich scientific and cultural heritage, ancient customs and traditions that the family is a sacred value for us at any time and in any place. Consequently, our ancestors perfectly understood that the stronger the family, which is a social unit based on educational, spiritual and educational, spiritual, moral, economic and legal relations, the more sustainable the development of society.

Therefore, our ancestors took the family very seriously. Our great scientists Mahmud Kashgari, Ahmad Yugnaki, from Kaykovus to Beruni, Ibn Sino, Farabi, Alisher Navoi, Mirzo Ulugbek and others in their works focused on the problems of the family, in particular, on the relationship between family members, the role of parents, grandparents in the upbringing of children, the role of this important social institution in the formation of an ideal and patriotic personality, they wrote exemplary stories, legends, letters to children, wise sayings, advice, life conclusions through verse lines. Our famous enlightened Jadids also emphasized that the only way to raise a generation with good morals, physically and spiritually mature, is to build a stable family, without which the development of the state and society is impossible.

Family education is always complex and multifaceted, and it imposes a responsibility on a person. Each family is a unique world. A healthy family environment, humanity, humane attitude affect the spiritual world of our children. We must not forget that our sacred religion, our true faith, plays an important role in the formation of wonderful family relationships. In our national values, which are intertwined with Islamic spirituality, the family and women in it are treated with great respect and attention. The word "woman" is used in 35 suras and 102 verses of the Koran, and one of the suras is called "Nisa", that is, "Women", and a detailed description of the status of women, their place in life, their rights is a vivid expression of the attention paid to them.

The Prophet (peace and blessings of Allaah be upon him) said: “The greatest faith of believers is their impeccable good behavior. The best of you is that you treat your wife well ”, (from at-Tirmidhi's messages).

According to our national spirituality, a mother who wants her child to be a science-loving, intelligent person must first of all get an education. The mother should read more while the child is in the womb, should read fiction, poetry. Participate in good conversations and, of course, most importantly, wish you all the best. The sooner science starts, the better. As Abdurauf Fitrat said: “Since education is a religious and secular obligation for everyone, women should also study science. My argument is so solid and logically correct that wise and honest people would never dare to oppose it...

To achieve this goal, our wives and daughters, mothers of the nation, should receive upbringing and education, and their morality and knowledge should be improved. Otherwise, our children will be like them, because our wives are more cowardly, weaker and less motivated than men. In verse 58 of Surah al-Araf of the Holy Quran, the same meaning is indicated: "A pure and useful plant grows easily on clean soil, and nothing comes out of unclean soil but thorns". [8]

According to our national values, the father should play the greatest role in the family, in the upbringing of the girl. Unfortunately, in our society, raising a girl is often the mother's responsibility. It is as if the girl was raised by her mother and the boy was raised by his father. But this is a delusion. The girl's father is the person responsible for the girl's future relationship with her husband. Because the father is a real guardian in the life of his daughter, who sets an example, loving, kind, responsible, is the first support man who provides a peaceful life. A girl who grew up with this treatment is not afraid of the future. Growing up in the arms of a loving father, the girl will be self-confident, self-respecting (because the father will prove it with his love), will believe that she can do a lot, and she will be sure that in the future she will also be a beloved wife for her husband. It is these beliefs that will set the stage for this girl to make her husband and herself happy. That is, she will form as a girl worthy of it. But in a family, everything can be the other way around, if the father is rude to the mother, even if he raises his hand to his wife, the father does not respect the mother. A girl who grows up seeing this relationship, getting married, will hate her husband for no reason and will repeat the fate of her mother. Because after the situations she sees in the family, this girl thinks that all men treat their wives the same. The girl's enmity towards her father will last all her life and will be repeated in the lives of her children. That is, her children will also have hostile feelings towards their fathers. If a girl grows up with a lack of paternal love, that is, from a divorced family, she grows up unprotected, mentally

weak, drooping, or, conversely, aggressive, arrogant, trying to surpass men, not respecting men. Such girls are just trying to believe in themselves, to achieve something, relying on their own strength, hard work. Because they don't know how to ask someone for help, but they don't admit that they are helpless. Their personal lives are often tragic, and even if they achieve happiness, they can only achieve it through great losses and many experiences. In most cases, these girls do not want to get married, become "masters of their lives and destiny," want to live alone and want to "make a career". Therefore, fathers must express their love, attention and respect for their wives and show this to their children in the family, he must not separate his sons and daughters, he must beautifully form a family, he must strive for the prosperity of our society, and for this he must live with a full sense of the immense responsibility that he bears.

"The most difficult task in a family is to raise a child after birth. Raising a child is actually two prayers. This is why it seems like a very small problem to you. But wise people know that the basis of the political, religious and social revolutions of an understanding person is a combination of these two words - "raising a child". It depends on people's behavior, their wealth, happiness, dignity, courage, weakness, humiliation, poverty, neglect, dependence on others, slavery and bondage, their upbringing from their parents".[9]

In Islamic spirituality, parenting is one of the most responsible and lasting responsibilities of parents. Other duties end with the performance of any work or the expenditure of property. But the responsibility for upbringing is a long-term stage. Indeed, the parent's true gratitude for the child's blessing is also manifested in the worthy fulfillment of the parenting duty. Usually, mothers fall for deception when they cannot involve their children in the business. They lie promising to give something, catch them and start beating them. In doing so, they harm the child's upbringing by setting a bad example for him. For every child, his parents will be the greatest people in the world. The child imitates his parents and takes an example from them. It is natural for a child to realize that this is the greatest and most exemplary person in the eyes of the child can lie, it is obvious that the child may have a notion that he or she can do the same.

This is why parents should always be a good and beautiful example for their children. They should exhibit all good qualities and keep away from all bad qualities. Parents should not only set a personal example for their children, but also teach them etiquette carefully and not lazy. Because the most valuable and necessary thing that a parent gives to children is upbringing.

According to our national values, everything is strong when it is connected with the original, everything that is not connected with the original is doomed to humiliation and ruin. The original person is his parents. Because they are responsible for ensuring that he grows up and becomes prosperous. The state of a person separated from his parents has never been and never will be. A person separated from his parents or from one of them becomes a person who does not know himself, unfaithful, changeable. As a result, such people harm society. In the words of our president, "I would like to take this opportunity to address the general public, first of all, our respected elders, wise and loving mothers. Please help us in this painful matter.

I would be very grateful to all of you if you and our dear youth show initiative and activity in preventing family conflicts and reducing divorce".[10]

In short, overcoming the damage caused by globalization to spirituality and family values can only be solved by promoting and restoring our national values, shaping them in the minds of young people, and solving this problem should become our urgent and also important task. We can achieve this goal only when spiritual centers, representatives of religion, educators, teachers and scientific experts work together.

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IMPROVEMENT OF THE SYSTEM OF REMUNERATION FOR EMPLOYEES OF HIGHER EDUCATIONAL INSTITUTIONS

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Annotation: *This article discusses the problems of the effectiveness of the current system of remuneration of the teaching staff of higher educational institutions and develops scientific recommendations for determining the amount of wages that stimulate their work and ultimately increase the effectiveness of their scientific and pedagogical activities.*

Keywords: *higher education, labor motivation, wages, wage system, incentives, basic salary, GDP per capita, national income, quantity and quality of work, creative work, innovative economy.*

Introduction

Currently, the formation of an innovative economy has become the main criterion for assessing the socio-economic development of human society. The formation of an innovative economy cannot be carried out or even imagined without the leading force of scientific progress, which is increasingly being improved both from a quantitative and qualitative point of view, i.e. active and highly productive work of scientists, professors, teachers and all other scientific researchers.

Western countries, which timely understood and adequately assessed this vital fact, paid serious attention to the issues of labor motivation of the population engaged in scientific research. They, through the creation of various motivational mechanisms of material incentives and their appropriate use in practice, have formed a system of powerful influence on the scientific and creative activities of people engaged in research activities.

The work, begun with great foresight and great intellect, has yielded practical results: to date, Western countries have achieved colossal results in socio-economic development. The scale of socio-economic benefits that they receive through the intensive development of innovative processes is very wide. For example, the United States is the first economy in the world in terms of innovative development. Although the US population is only 5 percent of the world's population, it accounts for 20-25 percent of world GDP. 40 percent of Nobel Prize winners live in the United States. According to statistics, due to the innovative development of the economy in this country, 27.1 million new jobs were created (18.8% of the total number of jobs), innovative sectors provided additional income in the country's GDP in the amount of 5.06 trillion. US dollars (34.8% of GDP).

In the twentieth century, life expectancy in the country has almost doubled, and incomes and living standards have skyrocketed.[1] There is no doubt that the hard and productive work of scientists is the basis for achieving this level of socio-economic growth.

Today in Uzbekistan, where the formation of an innovative economy is considered a priority area for future development, the problem of establishing a reasonable, from the point of view of society, the size of the remuneration of workers employed in the field of science and education is gaining great importance. The fact is that the transition to a new quality of a competitive innovative economy depends, first of all, on labor and the degree of interest in demonstrating high results of workers in this sphere, in terms of achieving innovative development. The problem of developing the country's economy on an innovative basis cannot be solved without the use of an effective system of motivation for highly qualified specialists, scientists, scientific researchers and stimulating them to more productive and high-quality work. This is an axiom that does not require proof and has already been reliably verified by the practice of developed countries.

The government of Uzbekistan is currently focusing on improving the remuneration system for educators and researchers, and in this regard, a number of noteworthy measures have been implemented. In particular, a number of measures have been taken to increase the salaries of professors and teachers and to encourage the results of their work. For

example, starting in 2020, doctors of science (Doctor of Science) who have achieved high results in their scientific research will receive up to 60 percent of the monthly salary allowance, and candidates of sciences or doctors of philosophy (PhD) (or equivalent degrees in foreign countries) countries) up to 30 percent of the monthly wage supplement, as well as the regulation on the procedure for paying additional payments to employees engaged in scientific, pedagogical and labor activities in all state organizations in the field of education and science.[2]

Based on statistical data, it is safe to say that in the context of the ongoing large-scale economic reforms in the country, the salaries of professors, teachers and researchers, if compared with the previous periods of independence, have increased significantly in recent years. However, if we compare the average salary of workers in the scientific sphere of Uzbekistan with the salaries of scientific workers in foreign countries that are leading in socio-economic development and in which innovative activity is developed, we can be sure that the situation does not deserve praise.

Our research has shown that, despite a number of measures taken by the state in recent years to improve the remuneration system for professors and researchers in higher education institutions, the motivational role of the existing remuneration system is still very low. The results obtained indicate that in the country the full mobilization of the capabilities and potential of scientists, stimulating them to achieve high results in educational and research work in solving scientific problems of the development of the national economy, does not meet the requirements. It is no coincidence that the President of the Republic of Uzbekistan Sh.M. Mirziyoyev, focusing on the problems of the higher education system, noted that "it is regrettable that in the conditions of accelerated economic development, the higher education system, instead of being a" locomotive "of development, does not keep pace with the times."[3] In our opinion, one of the important directions in solving the problem outlined by the President of the country is the formation of a modern system of stimulating the effective work of professors and teachers of universities.

According to experts, for one US dollar spent on the higher education system in developed countries, the government ultimately makes a profit of six US dollars.[4] However, unfortunately, today in Uzbekistan, due to the lack of a highly effective motivational mechanism that contributes to the full realization of the scientific potential of workers in the field, this factor of increasing profits to the state treasury is not used effectively.

In this regard, the problem of adapting the mechanism for generating the income of employees employed in the field of higher education to the principle of full mobilization of the labor potential of each scientist and improving the system of remuneration of employees of universities remains urgent.

Analysis of literature on this topic

Significant contribution to the formation and development of the theory of motivation and labor stimulation was introduced by foreign researchers: K. Alderfer,

J. Adair, V. Vroom, F. Herzberg, K. Levin, E. Lawler, D. McGregor, D. McClelland, A. Maslow, W. Ouchy, L: Porter, F. Taylor, et al. Scientists-economists of the Commonwealth of Independent States V.V. Adamchuk, A.P. Bagirova, N.A. Banco, O.S. Vikhansky, A.G. Zdravomyslov, A.I. Naumov, B.A. Kartashov, A. Ya. Kibanov, M.M. Potashnik, M.G. Rogov, N.S. Yashin and others also dealt with the problems of motivation and stimulation of labor. Many theoretical and methodological issues related to distributional relations and incomes in Uzbekistan were studied by economists of the republic - S.S. Gulyamov, A.U. Ulmasov, H. Allakulov, N.U. Beknazov, T.T. Dzhumakulov, K.Kh. Abdurakhmonov, Sh.R. Kholmuminov, Y.A. Abdullaev, M.M. Mukhammedov, N.K. Zakirova, A.A. Rakhmatov, B.B. Akhmedov, U.S. Yuldashev, R.F. Dzhumanov, R.R. Khasanov and others.

In modern science, there are a number of studies devoted to the consideration of various aspects of motivation and stimulation of the professional activity of the teaching staff of higher educational institutions. However, they did not separately study the problems of creating an incentive system that reflects the specific nature of the work of professors and teachers of higher educational institutions in

this area inherent in the sphere. These studies did not solve the problem of forming a system for stimulating the final results of labor of employees of higher educational institutions, which is important from the point of view of the socio-economic development of society.

Research methodology

Since the subject of our research is devoted to the issues of increasing the incomes of employees of higher educational institutions, first of all, the tasks defined by the Decrees and Resolutions of the President of the country, Government Resolutions, as well as scientific works of scientists-economists on this topic were studied. Methods of statistical analysis, comparative analysis of literature and methods of substantiating hypotheses were used as the research methodology.

Analysis and results

One of the features of educational services is that the results of labor employed in this area, its quality and quantity have a direct and strong impact on the rate of economic growth, the size of the country's gross domestic product. It is known that today Uzbekistan is faced with the task of forming a model of economic development based on innovation. The solution to this urgent problem is closely related to the effective use of the scientific potential of the teaching staff of the country's universities.

In order to improve the scientific and educational activities of universities and increase their innovative potential, it is necessary to radically increase the efficiency of the system of material incentives for the teaching staff. Since the motivational effect of the current mechanisms of remuneration of the teaching staff of universities is very low, it does not correspond to the ideas of full mobilization of the capabilities and efforts of scientists to solve scientific problems in the development of the national economy, to effectively stimulate the achievement of high results in educational and research work, to make a significant contribution to achieving in the future Uzbekistan a worthy place among developed countries.

In modern conditions of educational activity, the system of material incentives for the teaching staff of higher educational institutions should be created on the basis of the development of a remuneration system, taking into account the complexity of the work performed, the quantity and quality of labor expended. In our opinion, the system of material incentives for the teaching staff of higher educational institutions should depend on indicators for assessing the effectiveness of the activities of educational institutions.

The introduction of basic official salaries in 2008 made it possible to eliminate a number of shortcomings inherent in the previously applied Unified Tariff System. To some extent, the relationship between the performance of professors and teachers and their earnings in the form of wages has increased. However, the introduction of basic salaries did not allow to radically improve the quality of educational services, to finally solve the problem of ensuring the effectiveness of research activities through the mechanism of generating income in the form of salaries of professors and teachers. In the course of the study, we identified a number of shortcomings inherent in the basic official salaries introduced into practice.

The main disadvantages of the new remuneration system introduced in higher education institutions

Components of remuneration	**Certain disadvantages**
Basic salaries	1. The academic titles of associate professor and professor assigned by the Higher Attestation Commission are not taken into account; 2. The official salaries do not take into account the length of service.
Allowances	1. The practice of paying the same bonuses to all employees at the same time and without taking into account the quality of work.
Incentive payments	1. Lack of an objective mechanism for measuring the effectiveness and intensity of the activities of professors and teachers; 2. Lack of an objective mechanism for assessing the quality of the activities of professors and teachers; 3. Low efficiency of the mechanism for assessing the level of work performed; 4. The absence of a difference between the salary of an employee who works efficiently and an employee who does not work efficiently;

	4. Lack of an economically sound mechanism for motivating professors and teachers in the management; 5. Lack of rating of the activities of the teaching staff.

In our opinion, another of the most serious shortcomings of this system is that its implementation did not ensure the superiority of the wages of workers in the sphere over the wages of workers in other spheres of the national economy.

In our opinion, the wages of workers in the field of science and education should be no less than in other sectors and branches of the national economy, and, if possible, higher than theirs. Only then will it become the main engine of economic growth, the leading force, smoothly leading the country onto the path of economic growth. But the results of empirical analysis showed that the situation in Uzbekistan is not so good (table 1).

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Table-1: Average monthly nominal wages of workers by sectors of the economy of Uzbekistan 2017-2020 [5]

	Years			
	2017	**2018**	**2019**	**2020**
In the whole republic	**1457,8**	**1822,2**	**2324,5**	**2667,6**
Industry	2090,7	2731,1	3310,2	3682,9
Construction	1777,9	2297,3	2761,2	3212,3
Trade	1676,5	1990,3	2469,8	2748,1
Transportation and storage	2028,6	2507,4	2965,5	3405,3
Information and communication	2502,2	3347,5	3971,8	4368,8
Financial and insurance activities	2694,7	3500,5	4798,4	6230,6
Education	1160,2	1396,4	1841,2	1979,7
Health care and social services	979,4	1173,1	1534,3	1808,5
Other	1261,8	1711,2	2309,1	2672,4

As can be seen from the above table data, the average monthly wages of workers in the education sector are much lower than those in other spheres and sectors of the national economy. Even after a series of measures taken by the state in recent years to increase the salaries of researchers, professors and school teachers, the situation has not changed. In 2020, the average wages of educational workers amounted to 72.0% of the average wages of trade workers, 45.1% in communications and information and only 31.8% in finance and insurance. In our opinion, such a situation does not fully correspond to the idea of transforming education into a key driver of the development of the national economy.

In order to clarify the situation, we compared the wages of education workers in Uzbekistan with the wages of a number of foreign countries (Table 2).

Table-2: Average monthly wages of service workers around the world in 2019 (in USD) [6]

Service industries	**Среднемесячная заработная плата**			
	США (1160,0)	**Германия (1678,0)**	**Россия (174,0)**	**Узбекистан (25,0)**
Trade and catering	4760	4234	453	281
Education	3550	4970	442	169
Health care		6093	462	149
Транспорт	3760	6292	572	343
Услуги информации и связи	5670	6216		
Финансовые услуги	5540	6290	1145	405
Государственные услуги	3263	4438	-	-
Другие виды услуг	3080	-	-	-
В целом по сфере	**4580**	**4576**	**560**	**219**

The results of the analysis showed that the average monthly wage of workers in the education sector in Uzbekistan is lower than the average wage of all employed in the national economy by 22.8 percent, by 40.0 percent of trade and public catering workers, by 50.8 percent of communications and informatization workers, and approximately 2.4 times lower than employees of financial services. At the same time, in Germany, the average wages of workers in the education sector are 17.4% higher than in trade and public catering, 12.0% higher than in the civil service and 9.0% higher than the average wages in the economy as a whole.

Suggestions and conclusions

Currently, there is a sharp difference between the salaries of teaching professors in Uzbekistan and the salaries of teaching professors in developed countries. For example, in the United States, 50% of PhDs receive an average salary of $ 70,600 per year.[7] A laboratory assistant at a research university receives a salary of 40 thousand a year, that is, an average of 3.3 thousand dollars a month. In Germany, an experienced professor of a scientific institution receives a salary of 41.5 thousand euros per year, young specialists in the field of science - 34 thousand euros or more. Even in South Africa, Malaysia, Argentina and Colombia, salaries are very high for scientists.[8] How can you currently compare the monthly salaries of doctors of sciences and other scientific workers in Uzbekistan with the indicators of countries where science is highly valued?

In our opinion, the above causes an urgent need to improve the wages of workers in the field of science and education in Uzbekistan on the basis of bringing their size closer to world standards. Because for the production and supply of innovative goods and services to world markets that can meet the requirements of the time and compete with products created in developed countries, representatives of the scientific sphere of our country are required to create and implement competitive innovative ideas of the world level. Therefore, from the point of view of social justice, the salaries they receive should also be as close as possible to the salaries of foreign researchers. It is not surprising that it is precisely because of the low level of salaries that many scientists and leading specialists of Uzbekistan work in Russia and other countries of the world. However, in the conditions of the formation of an innovative economy, there is a great need for highly qualified, potential inventors of innovative ideas who can make a real contribution to the development of the economy. In order to attract such personnel to work in the national economy of the country, it is necessary to pay them a salary not lower than that which they currently receive abroad.

In our opinion, even under such difficult conditions for the country, it is necessary to return them to Uzbekistan and use their opportunities for economic development. At the same time, the outflow of talented research scientists with high innovative potential is prevented. We think that this event will definitely have a positive effect.

In our opinion, narrowing the gap between the salaries of professors-teachers and scientists in Uzbekistan and countries where the work of people of science is highly valued, on the one hand, serves to implement the idea of returning to the country of our compatriots working abroad, on the other hand, it reduces the number of talented young people who go abroad because of the relatively high salaries. The problem is that as a result of the implementation of a policy aimed at in-depth study of foreign languages among people of science, in recent years, among young talented scientists and researchers, the proportion of highly qualified specialists who are fluent in English and other foreign languages has increased. Naturally, the opportunity to earn several times higher than ours encourages our youth to work abroad. As a result, Uzbekistan will lose part of its unique scientific potential, which is priceless for it.

In our opinion, in order to increase the role of the education sector in innovative development, it is necessary: first, in modern conditions to develop a remuneration system that takes into account the complexity of the work performed, the volume and quality of labor expended in the system of material incentives for the teaching staff of higher educational institutions; secondly, the introduction of a motivational mechanism

based on an objective upper wage limit for all workers in the education sector; third, labor rationing based on international standards; fourthly, to develop and consistently introduce into practice effective methods and ways of motivating education workers.

In our opinion, the improvement of the remuneration system for professors and teachers of higher educational institutions should be based on the following criteria and principles:

- differentiation of official salaries in accordance with the academic degree;
- tie the base official salaries for each position to the length of service;
- to stimulate the work of professors and teachers by assessing their intensity and effectiveness;
- introduction of a mechanism of compensation payments;
- implementation of social payments.

Taking into account the above, it is recommended to form a system of remuneration for professors and teachers of higher educational institutions on the basis of three components: base official salaries, allowances and incentive payments at the end of the year.

Studies have shown that in world practice, that is, in most countries of the world, the salaries of scientists, teaching staff, employees of higher educational institutions and research institutes are consistent with their contribution to increasing gross domestic product (GDP) and GDP growth by per capita.[9] Through the use of this progressive incentive mechanism, it is recognized that the rate of economic growth in a country largely depends on the results of the work of scientists and researchers.

Consequently, employees of higher education institutions have a significant positive impact on the rate of economic growth and the volume of GDP, on the one hand, through the invention of innovative ideas that can bring productive forces to a new level of excellence, and on the other hand, through the training of qualified personnel. For this reason, we consider it expedient to use in Uzbekistan the mechanism of formation of the wage fund for workers in the sector, depending on the volume of GDP and the rate of its growth. At the same time, in the calculation process, it is proposed to exclude investments (I) and indirect taxes (S) from the amount of GDP (Q), i.e. in the form of a base, get the amount of net national income (Q1). The essence of our approach is that investments (depreciation fund) and indirect taxes, which represent the transferred value, do not have a close relationship with the performance of workers in this area. Proceeding from this, we put forward a proposal that the criterion for the upper limit of the basic official salary of professors and teachers of higher educational institutions should be the value of the national income per capita.

We have calculated our offer using calculations based on specific figures.

To do this, we first determined the size of the national income produced in the country in 2019-2020 (3-table).

National income was calculated using the following formula:

$$Q1 = Q - (I + S)$$

table-3

Analysis of the dynamics of the composition and structure of the national income of the Republic of Uzbekistan (billion soums)

Name indicators	Years		2020 in relation to 2019,%
	2019	2020	
GDP (by income) - Q	510117,2	580203,2	113,7
Investment -I	230469,5	217362,2	94,3
Indirect taxes on business S	45262,7	44372,2	98,0
National income	234385,0	318468,8	135,9
National income per capita - Q1	7048,0	9392,9	133,3

Source: Calculated on the basis of annual statistical collections of the Republic of Uzbekistan.

Highly qualified professors and teachers for their effective work for the good of the country should receive wages in accordance with the amount of national income created during the

year in the country. This can be expressed in an economic and mathematical model that looks like this:

ZP = D * k

where,
Salary - the size of the monthly salary
D - national income per capita
K - coefficient

The coefficient allows us to determine the final salary of professors and teachers, taking into account their position and level of qualifications, while the upper limit is limited by a coefficient of 2, the lower limit is 0.5, and it is advisable to divide the categories of professors and university teachers into seven categories (Table 4).

table-4: The size of the basic official salaries for labor remuneration for employees of universities, thousand soums *

№	Job titles	National income per capita	Coefficient	Base official salaries
1.	Doctor of Science, Professor	9392,9	2	18785,8
2.	Doctor of Science, Associate Professor	9392,9	1,75	16436,4
3.	Candidate of Science (PhD), Associate Professor	9392,9	1,5	14088,3
4.	Candidate of Science (PhD), senior lecturer	9392,9	1,25	11740,3
5.	Senior lecturer without a degree	9392,9	1,0	9392,9
6.	Teacher	9392,9	0,75	7044,2
7.	Trainee teacher	9392,9	0,5	4696,1

* Developed by the author.

For example, the base salary of a doctor of sciences, a professor is 18,785.8 thousand soums, this amount is calculated by multiplying the size of the national income per capita (2020) by a coefficient 2. The base salary of the following positions is determined on the basis of established coefficients. According to these calculations, the trainee teacher, standing at the lowest place, will receive 4,696.1 thousand soums.

The introduction of our proposed remuneration system radically changes the motivation of work in higher educational institutions, will fully satisfy the growing needs of society for teachers-professors, highly qualified specialists, pay serious attention to the practical significance of their scientific research, stimulate them to search for ways to increase the volume of national income of the country, the creation of innovative ideas that save resources and increase labor productivity. At the same time, it increases the material interest of teachers in continuous work in their step-by-step career growth from a trainee teacher up to reaching the level of a doctor of sciences, enhances their interest in improving their qualifications. As a result of the application of the proposed approach in the higher education system of Uzbekistan, it will be possible to solve another very important problem, i.e. increasing the monthly salaries of professors and teachers by increasing the share of national income coming to them. This will help to establish social justice in distribution relations, increase the attractiveness of vacancies in the field of higher education in our country. The use of the proposed method in stimulating the work of professors and teachers of higher educational institutions in the country will, to some extent, reduce the sharp gap between the size of their salaries and the salaries of professors and teachers of foreign countries.

Doctors of sciences in the USA receive from 8000 to 15000 dollars a month, a doctor of sciences in Kazakhstan - 1000-2300 dollars, in Japan - 2800-4600 dollars, in France - 1900-4700 dollars, Malaysia - 2800-7800 dollars, in Turkey - 2100 -3800 USD.[10] Therefore, their status in society is high. It should also be noted that the salary of rectors of US universities is higher than, for example, that of the Minister of Defense of this country. However, in order for our scientists to receive such a salary, the level of development of the national economy must meet the criteria existing in the United States.

According to the recommendations of the International Labor Organization, an employee is prohibited from paying less than $ 3 an hour.[11] According to the Decree of the

President of the Republic of Uzbekistan, from January 30, 2020, doctors of sciences, professors have been paid a salary of 7,185,585 soums. If you divide that monthly salary by the professor's monthly workload, then his hourly pay is $ 4.50. An hourly pay for a professor in the United States is $ 52 (assuming he does a 154-hour workload and makes $ 8,000 a month). At present, the workload of our professors is 3-5 times higher than in foreign countries (800-1000 hours). Calculations have shown that if the base salary of professors is determined on the basis of the proposed method, then they can receive up to $ 12 per hour.

In conclusion, it should be noted that the current system of material incentives for the teaching staff of a higher educational institution does not meet the requirements of today. Since Uzbekistan has introduced a multi-stage form of education - bachelor's, master's, PhD, measures are currently being taken to introduce credit training technology. But their monthly salary remains at the level of the last century. But the fixed monthly salaries of university professors and lecturers are still very low and fall short of today's requirements. Currently, in order to effectively stimulate the work of professors and teachers, our state has the opportunity to pay wages to them in the proposed amounts. If we consider that the number of doctors of sciences in the country today is 1,181 people, the number of candidates of sciences is 6181 people, and the number of doctors of philosophy is 1,081 people,[12] then as a result of the implementation of the proposed method, the wage fund in 2020 will reach 121.9 billion soums. And this is 69.8 billion soums more compared to the annual wages fund, calculated according to the existing method (52.2 billion soums in 2020), or 2.3 times more. But the economic benefit to be derived from this measure is incalculable.

Uzbekistan can provide decent working conditions for scientists and professors, who are a minority, but play an important role in the innovative development of the national economy, etc.

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PEDAGOGICAL AND PSYCHOLOGICAL ASPECTS OF MEDIA USE IN EDUCATION

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ABSTRACT

The advantages of electronic media in the educational system are examined in this article. The importance of the topic is stressed in the introduction. The section on relevant literature reviews studies on media education by foreign and Uzbek scholars. The part on research methods covers the basics of media use in education. The findings of pedagogical studies to test the application of teaching methods based on theoretical study and practical development were given, as well as the effectiveness of student learning. The third portion discusses the relevance of using media education to organize the learning process.

Keywords: *Media, multimedia, hypertext, ergonomic requirements, illustration, reflection, virtual reality, autism, phobias.*

Introduction

Teachers must be fully adept not only in the use of information technology, but also in the transfer and processing of information, as well as in the development of an information culture in their pupils, in order to implement novel technologies in the learning process.

From the level of information to the level of personal development management, the new educational paradigm is focused on developing the knowledge, abilities, and competences of teachers in educational institutions. This means that information technology plays a unique role in this process; it is the primary tool for elevating the educational system and better meeting the needs of the state, the labor market, and society.

Depending on the form and means of presenting the learning content, the quality of learning can be high or satisfactory, regardless of the technical tools and technologies employed in the learning process.The advancement of modern methods and technology has resulted in a massive increase of media activities, information sources, and providers (library, archives, the Internet, and so on), allowing citizens to access a vast amount of information. As a result, citizens can evaluate the information's credibility and fully enjoy their right to freedom of expression. As a result, media and information literacy among kids is a serious problem.The term "media" (Latin for "mediator," "medium," or "way") refers to a variety of communication and media formats. The concept of media encompasses the technical means of transferring information between authors and the general public, as well as the means of creating, duplicating, and disseminating information .

The teacher's description of the content allows for customised and concentrated learning in a group learning situation, and modern information and communication technology is built for the "average" learner. Because of the media and communication opportunities, traditional educational approaches are changing. In a unique way, the media is introducing fresh innovations to the educational system and reorganizing disciplines .

The psychological issues that have arisen as a result of the educational system's digitization are numerous. Much of this is about the media's role in education, the dilemma of student-media interaction, and teacher-student interaction (today the student actively interacts with existing computer programmes and the student is quick, active and interactive). This suggests that the challenge of liberating people from media control is becoming increasingly scientific, and it can be accomplished by managing the process through the use of global and local networks.

A.V. Osin, a Russian expert, discusses five new pedagogical approaches to the new

educational opportunities offered by electronic media. Interactivity, for example, enables you to become certified for the first time without the assistance of an instructor. Communication allows you to provide material quickly, manage the learning process, and contact expert trainers no matter where they are. However, in terms of pedagogical considerations, these possibilities imply the employment of electronic media in the educational process (context, Latin Contextus - cast, compound, connection). It's also crucial to think about the relatively entire portion of the spoken or written word.Multimedia generates a new psychological environment in which information is received and stored. Modern information technology in education necessitates a focus on the educational process in order to improve learning by generating optimal functioning circumstances that strengthen the brain's ability to absorb knowledge. It is based on the brain's usage of neurophysiological mechanisms that are based on the principle of information processing, while also providing the brain with learning chances. Multimedia employs many data channels at the same time so that different instruments can assist one another. Students have a great opportunity to explore different aspects of creativity, and each source of information begins to be used in conjunction with the other.

Analysis Of The Relevant Literature

An analysis of existing scientific publications on the use of media technologies in education shows that the use of media education has attracted much attention worldwide and significant results have been achieved. In particular, Russian scholars Ya.N. Zasursky, E. P. Prokhorova, A. Sarkisyan, A. V. Fedorov, L. N. Fedotova, I. D. Fomicheva, and I. Khmara conducted research on media education.Bajenova L. conducted research on the use of media education in teaching M1-4 grades [3], Baranov O.A. conducted research on media education in schools and universities [4], Shergova O.B. Shergova conducted research on media education and journalism.In Uzbekistan, too, there are a number of expert opinions on media education. A number of scholarly articles on media education have been published in the journals “Education”, “Public Education”, and “Continuing Education”. In particular, Sh. Rakhimov's article in uz.infocom magazine "Basic concepts of media education", http://sharh.uz website article by Tolkin ESHBEK, Associate Professor, Faculty of Journalism, National University of Uzbekistan, an article by Professor Valery Solovey, a lecturer at the Moscow State Institute of International Relations (MSIIR), on the website https://telegraf.uz, entitled "Television's Management of Thought", Article by Professor of the Uzbek State University of World Languages F. Muminov on the website of the Department of International Journalism Theory and Practice, Faculty of International Journalism (http://trif.uz) entitled "Effectiveness of media education.", The article of the candidate of philological sciences Nargis Kasimova "Media study and why is it needed?" on the website http://www.uzhurriyat.uz, https://conference.fledu.uz B.Berdiyeva's article "The role of information and communication technologies and media education in the teaching of foreign languages", An article by Ahmad Rakhmatullayev, a lecturer at Termez State University and an associate professor, entitled “Media education is an important factor in educational effectiveness” at http://fikr.uz, Ya.Mamatova, S.Sulaymanova's textbook "Uzbekistan on the way to the development of media education" was published.

Research Methodology

One of the important features of the media is its imaginative, visual representation of various processes, which combines visual possibilities with various theoretical concepts.

Media modelling helps to create a vivid imagery of an object or event in different contexts, engaging all human senses. Hypertext technology provides an opportunity to develop logical thinking, reinforce the creative basis of learning and consolidate previously acquired knowledge.

Modern means of presenting information have increased the level of consideration given to the ergonomic requirements for learning materials: the size and type of font, the

possibility of including not only pictures but also sound and video clips in the text.From an ergonomic point of view, a new situation arises: the student chooses the most convenient, ergonomically concise type of information. It can independently select the necessary sentences of information obtained from the network, arrange the evidence in a certain order and reflect a way of thinking. As a result, students will have a better understanding of the issues, an increased interest in science and more active engagement with textbooks.The use of media focuses on individual learning, and this is the case in general education.In this case, the media is presented as an object of research and an educational tool.In the process of individualised learning, each pupil is actively involved in an activity aimed directly at him or her.This awakens the thinking process, shows the need for knowledge and develops creativity.

Electronic media control the choice of the optimum learning pace, the learning process and the results are reflected not in a few days but directly in the classroom.The student will have their own methods and techniques for mastering the material.

At the same time, the media has educational opportunities and requires a special approach, attention and organization.It allows you to work with a computer, plan your activities, and make responsible decisions.

Internet information resources provide the opportunity to take a virtual tour of world-famous museums and museums. Multimedia encyclopaedias and telecommunications technology provide an opportunity to explore the work of artists who have contributed to the past and present and to world artistic culture.The computer is a tool for shaping students' visual arts, artistic taste, imagination and creativity.

Learning in the class is abstract and disconnected from real-life scenarios because schools ignore the interdependence of context, situation and cognition. Therefore, for learning to be meaningful and effective it should take place in authentic contexts. Students learn much better when they are immersed in real scenarios because their interaction with contexts has a profound impact on the way they interpret an activity. More importantly, authentic contexts reflect the way the knowledge will be used in real life. Such contexts can be found outside of school and they are meaningful, interesting, and related to students.

If the traditional education system is perceived as an incentive (good grades, successful exams), the adoption of information and communication technologies will focus on shaping student learning opportunities, which will naturallyincrease learning effectiveness. The formation of such an opportunity depends on the level of preparation, the choice of learning options and pace, the specific and non-specific impact on the students' learning sphere in the form of interesting tasks, instructions, methodological assistance (when working online, system and student, student and teacher, through an interactive dialogue between the system and the teacher). Information and communication technology tools thus reinforce the psychological factor of the learning process.

In addition to the above-mentioned features of the use of media in education, which reflects the positive aspects of informatization of education, there are a number of cases that highlight the psychological aspects of informatization of the education system, which lead to a negative attitude towards it.

Illustrations, pictures, and graphics have a positive effect on the acquisition of textual information, but it should be noted that the simple combination of different sensory perceptions (sight, hearing, tactile sensations) does not automatically improve the learning process.An important condition for the use of multimedia in the teaching process is the discovery of symbol and code systems by users.

There is a link between thematic interest and learning. With the use of media, a well-organized learning process becomes a pointless activity that does not generate interest in the topic presented.

The use of electronic means of communication has a certain novelty effect, as well as a motivational and interesting presentation of the material, but this interest also decreases over time.

The following features should be considered by the educator in the use of media in the educational process.I.e, news produced under the influence of the media can be transferred to the traditional conditions of communication.According to psychologists, the accuracy, logic and consistency of the material presented increase, the content of reflection increases, but the role of emotional means of communication decreases.

The impact of electronic media on the learner can be high or low: from a limited range of mental phenomena to global problems that indicate personality change (internet connection, hacker syndrome, etc.). Psychologists, educators, and information technology professionals are paying close attention to the study of the effects of informatization for a variety of activities, such as play, learning, and professional activities. However, the issues of global changes in the human psyche have not been studied in a broad sense.

The application of high technologies to various spheres of activity, in particular, frees a person from everyday processes and, consequently, creates conditions for his development.This means that the introduction of media also turns many activities into unnecessary activities.However, misuse of the media can lead to serious losses. For example, the use of aimless calculators, even in elementary school, deprives students of the ability to count verbally and quickly in memory.As a result, students do not know how to work with numbers because they do not know the basic operations related to numbers.

Modern media have access to a variety of information.Therefore, the role of the educator is to turn the knowledge acquired independently by students into a source of new knowledge that they accept as a result of the learning process.

The widespread use of the media requires special measures for the emotional development of students.Technocratic thinking, which is formed under the direct and indirect influence of information technology, according to psychologists, man and his values (including in psychotechnics) are perceived as a means of technology, the content of everyday life in the modern world, universal interests and content goals.

Modeling and implementation of different situations, implementation of non-standard decisions are focused on the development of imagination, creative potential. Well-known psychologist J. Hasebrook points out that the ability to work with virtual reality systems can not only give students insight into cyberspace, but can also cause autism, i.e, withdrawal, secrecy and alienation from real life.

In this case, it is impossible to talk about the full development of the individual, if real actions are replaced by certain virtual models. At the same time, it is difficult to say that autism is a consequence of informatization, including the use of the media in education. In contrast, special computer systems have been used to treat diseases such as autism, and virtual reality systems have been used to treat a number of phobias, such as fear of heights.

Thus, the consequences of using the media can be both positive and negative, requiring a different approach to the use of a particular technology. When planning the use of electronic means in the educational process, the educator should take into account the individual characteristics of the student, create a lesson plan, taking into account the individual orientation of the material, which determines the direction of its development.

Analysis And Results

At the end of the theoretical study, a pedagogical experiment was organized to validate the use of media education methodology.

In the early stages of the experiment, the methodological aspects of organizing the learning process on the basis of media education were explored. There are good conditions for students to prepare for classes, work independently and demonstrate their skills in practice. The form and content of the workshops have been designed to ensure that students are creative in their approach to the learning process. For each topic, ways of using media education tools appropriate to their content were chosen. Relevant teaching materials have been collected and the forms and conditions for organizing the learning

process on the basis of media education have been defined.

Teaching General Pedagogy on the basis of media education has not only made it possible for students to master the subject matter in depth, but also to solve the problem of the interconnectedness of lectures and seminars.

In the pedagogical practice in the 2nd year of the educational direction of the pedagogical faculty "Primary education and sports, educational work" was organized an experiment on the subject of "General pedagogy". Experimental and control groups were selected. Group 203 was chosen for the experimental group, 201-202 groups for the control group.In order to determine the overall effectiveness of the results of teaching the subject "General Pedagogy" on the basis of media education, we consider the indicators of students' mastery of the subject.

Table 1

Average performance of students in the subject "General Pedagogy".

Name of science	hour		Experimental group			Hour		Control group		
	Lectur	Semin	Course,	Number of	Average master	Lectur	Semin	Course,	Number of	Average master
General pedagogy	*34*	42	203	29	69	*34*	42	201	29	62
								202	29	63

The results of the "General Pedagogy" examinations showed that the performance of the students in the experimental group increased by 6-7% compared to the control group.We can see this in the diagram below.

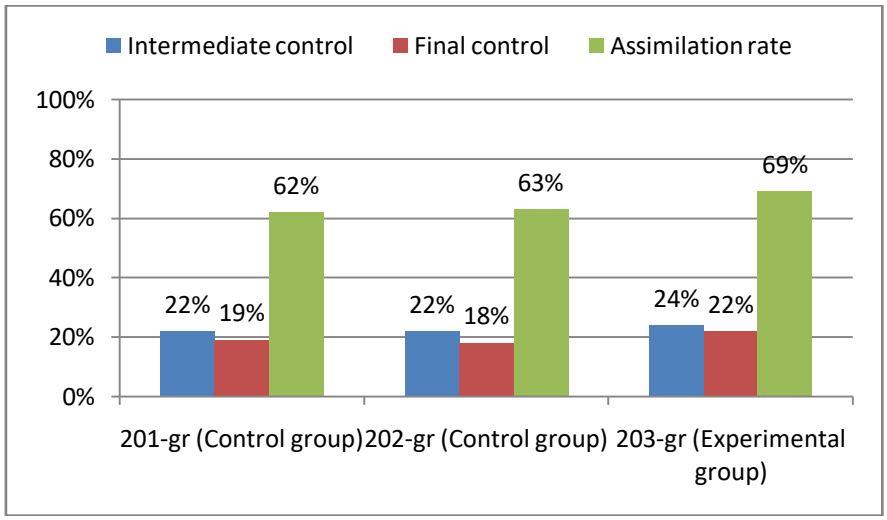

Figure 1. The results of experiments on the subject of "General Pedagogy".

From the above information, it can be concluded that conducting "General Pedagogy" seminars on the basis of media education will enable students to easily absorb the learning materials.

Conclusion And Suggestions

In short, we need to find ways to use modern communications technology in a more positive way. One such effective way is to further improve education through media technology. Thus, media education not only enhances the intellectual potential of students, but also protects them from various ideological aggressions. Organising the learning process on the basis of media education also enables students to find reliable information on a topic during independent work, creating a culture of effective and safe use of information in today's rapidly developing information technology.

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FORMATION OF TAXABLE PROFIT OF THE ENTERPRISE IN THE CONDITIONS OF DEVELOPING MARKET RELATIONS

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ABSTRACT

This paper is devoted to the analysis of the formation the taxable profit, in particular, sources of profit and financial resources. It is shown that in the current conditions, in the composition of both profits and financial resources formed in the order of redistribution, an increasing role will gradually be played by payments of insurance compensation received from insurance companies, and an ever smaller role - by budgetary and industry financial sources. The profit of business entities, as a source of financial resources formation, can be used by them in various directions. The search for financial sources of profit in order to ensure the development of the enterprise, the most effective investment of financial resources, transactions with securities and other issues of financial management become the main ones for the financial services of enterprises to compare the costs associated with the use of the entire system of financial resources, and costs in order to extract the minimum or maximum profit. Summarized that cost accounting and calculation remain the most important both in the system of financial, tax and management accounting, reflecting the most significant changes in the methodology and methodology for determining the total costs and profits of enterprises.

Keywords: *Profit; Costs; Taxes; Enterprise; Profit formation; Investment; Financial resources; Financial management.*

1. Introduction

As a rule, each enterprise sells its products at negotiated wholesale prices, which include the cost of production, profit, excise tax, value added tax and transportation costs for the delivery of goods to the departure station. This price is indicated in delivery contracts, invoices and waybills. Only after the sale of products, enterprises reimburse their expenses, make a profit and pay taxes due.

Hence, it is concluded that the profit from the sale of products for tax purposes may not be equal to the profit reflected in accounting. When enterprises sell products (works, services) at prices not higher than the actual cost price, the market price for similar products, prevailing at the time of sale, but not lower than the actual cost price, is taken for tax purposes. This procedure leads to the payment of income tax in the absence of real income.

In the practice of tax legislation of developed countries, much attention is paid to the concept of a market price: criteria for recognizing a transaction price as a market price have been developed, rules used for tax purposes when concluding a transaction between related parties to adjust the transaction price and tax liability. In some cases, in accordance with the law, the transaction price may not be recognized as a market price, in which case the rules for adjusting such a price for tax purposes come into effect. At the same time, based on international experience, our legislators should also develop a mechanism for such regulation.

The initial and, perhaps, the main one is also the question of individual parts of the gross profit, the nature of the interaction these parts with the generated net profit.

A separate component of the gross profit can also be the profit from the sale of fixed assets and other property. Their appearance is associated with the search for new financial instruments that ensure the determination of their size in order to regulate the volume of net profit.

By its nature, profit (loss) from the sale of fixed assets, their other disposal, the sale of other enterprise property is a financial result that is not related to the main activities of the enterprise and you can easily determine its size in the total amount of gross profit. It reflects the profit (loss) on other sales, which includes the sale to the side of various types of property on the balance sheet of the enterprise. Accounting for this part of the profit when forming the net profit, in our opinion, is fundamental and difficult.

Unfortunately, theoretically and methodologically this issue is not yet fully developed, and therefore there are significant

differences in its interpretation. For example, proceeds from the sale of fixed assets or property of enterprises are practically included in gross profit and are subject to taxation. This is indirectly double taxation. In theory, the existence of double taxation of income is considered ineffective. In our opinion, the proceeds from the sale of property should be included in the net profit, and only after the payment of income tax.

That is, the issues of the taxable profit formation are still relevant and require research and improvement.

1.1. Research Methodology

The article uses an expert analysis to assess the structure and process of forming the profit of an enterprise.At the same time, empirical analysis allows us to investigate a useful component of the costs calculation application of the enterprise in relation to the formation of the enterprise taxable profit.

1.2. Literature Reviews

Tax rates in most countries of the world are non-linear and affect the share of net profit in gross profit, becoming equal to it if the enterprise suffers a loss or, becoming a part of it, if the enterprise makes a profit.Joel Slemrod believes that income derived from goods and accessories for leisure activities should be taxed at higher rates, in favor of lower taxation of goods and services intended for work, aDaveri and Tabellini, Mankiw et al.note that tax-induced kinks in firms' profit functions may also have implications for the dynamic properties of the markets involved.Behavioral advocates argue that past profits are a major determinant of firms' go-to-market decisions, similar to Branch and McGough's, Goeree and Hommeses, Dieci and Westerhoff's, Laselle et al evolutionary models. Entrepreneurial ability is a resource that is difficult to establish transparently monitored and cannot be directly taxed. However, it is quite possible to trace the volume of production and this allows one to draw conclusions (or not) about the presence of profit in the company. In this aspect, companies with high profits prefer to hide information and convince that profits are small, and therefore pay less taxes.

Christian J. Bauer, Dominika Langenmayr believe that transfer prices set at market prices based on the principle of "market value" systematically exceed the marginal costs of multinationals, which leads to a reduction in tax payments for each unit sold. Thus, the optimal organization of firms provides a new rationale for the empirically observed lower tax burden of multinational corporations.

Thus, optimal organization of firms provides new justification for the empirically observed lower tax burden of multinationals suggesting that transfer prices can be manipulated at the expense of costs. These profit mobility opportunities are the only reason for the integration and different tax burdens of integrated and outsourced companies.

This paper's aims to consider the process of taxable profit formation of enterprises in Uzbekistan, shows the relationship between costs and profits of an enterprise. The conclusions of the authors on the accounting of costs and costing are presented.

2. Material And Methods

In developing market relations, cash income and profits at the disposal of enterprises and intended to fulfil various socio-economic and financial obligations, implement costs for expanded reproduction and economic incentives for workers, are the basis for enterprise profit management. However, the formation of profit in all its varieties is carried out at the expense of own and equivalent funds, mobilization of resources in the financial market and the receipt of funds in the order of redistribution and credited as other income of enterprises.

The initial formation of the enterprise financial resources occurs at the time of the enterprise's economic activity, and then when the authorized capital is formed[13].Its sources, depending on the organizational and legal forms of management, are not only a part of the additional product created by the enterprise, but also equity capital, shares of members of cooperatives, sectorial financial resources (while maintaining sectorial structures), long-term credit, budget funds.The size of the authorized capital shows the size of those funds - fixed and circulating, which are invested in

the production process in order to make a profit.The size of the authorized capital shows the size of those funds - fixed and circulating, which are invested in the production process in order to make a profit.

The main source of profit, as well as financial resources in general at operating enterprises, is the cost of products sold (services rendered), various parts of which, in the process of distributing proceeds, take the form of cash income and savings. At the same time, if financial resources are formed mainly at the expense of profit (from main and other types of activity) and depreciation deductions, then profit acts as the difference between total receipts from the sale of products (goods, services) and total costs.

Elements of each type cost are fixed by the enterprise in accordance with the Regulation "On the composition of costs for the production and sale of products (works, services) and on the procedure for the formation of financial results"[14]. Along with them, the sources of profit and financial resources are also:

- proceeds from the sale of retired property;
- stable liabilities;
- various targeted receipts (payment for the maintenance of children in preschool institutions, etc.);
- mobilization of internal resources in construction, etc.

Along with the above, another source of both the first and second financial resources plays an important role - share and other contributions of the labour collective members, if they are included in the turnover in order to ensure the efficient operation of enterprises in order to generate profit.

Financial resources, especially for newly created and reconstructed enterprises, can be partially mobilized in the financial market[16].The forms of their mobilization are: sale of shares, bonds and other types of securities issued by this enterprise, credit investments.

At the same time, it should be noted that a significant share of profits for the purpose of accumulating financial resources during the period of the administrative-commercial system was received on the basis of intra-industry redistribution of funds and budget financing. However, the principles of market management, the introduction of commercial principles into the activities of enterprises, naturally, demanded fundamentally different, that is, market approaches to the formation and use of financial resources. In addition, both the entrepreneurial spirit and responsibility manifested in the conditions of a developing market economy have led to two major changes in the field of financial relationships of enterprises with other structures: firstly, the development of insurance operations, and, secondly, a significant reduction in the scope of gratuitous appropriations.

In this regard, in the current environment, in the composition of both profits and in the composition of financial resources formed in the order of redistribution, an increasing role will gradually be played by payments of insurance compensation received from insurance companies, and an ever smaller role - by budgetary and industry financial sources.Subjects of economy under market conditions will be able to receive financial resources: from associations and concerns they belong to (only if this is provided for by the mechanism for using the appropriate funds and profits); from higher organizations - while maintaining industry structures; from government bodies - in the form of budget subsidies for a strictly limited list of costs. But in the conditions of the securities market functioning, there will appear such types of financial resources as dividends and interest on securities of other issuers, as well as profit from financial transactions.

In the conditions of developing market relations, the profit of economic entities, as a source of financial resources formation, can be used by them in various directions, in particular:

- payments to the bodies of the financial and banking system, conditioned by the fulfilment of financial obligations. These include: tax payments to the budget, payment of interest to banks for the use of loans, repayment of previously taken loans, insurance payments, etc.;
- investing own funds in capital costs (reinvestment) associated with the expansion of production and its technical renewal, the transition to new progressive technologies, the use of know-how, etc.:

- investment of financial resources in securities purchased on the market: shares and bonds of other firms, usually closely linked by cooperative supplies with this enterprise, in government loans, etc.;
- the direction of financial resources for the formation of incentive and social funds;
- use of financial resources for charitable purposes, sponsorship, etc.

In the context of the implementation of the priority areas of the state program of the Strategy for the Development of the Economy for 2017-2021[18] not only the role of enterprise managers has increased enormously, but also those involved in the financial operations of enterprises. The search for financial sources of profit in order to ensure the development of the enterprise, the most effective investment of financial resources, transactions with securities and other issues of financial management become the main ones for the financial services of enterprises.

The essence of financial management lies in the organization of financial management by the relevant services, which allows you to attract additional financial resources on the most favourable terms, invest them with the greatest effect, carry out profitable operations in the financial market, buying and reselling securities. Along with this, the efficiency of using profit should bring additional profit, then it is obvious that it is necessary to measure the overall efficiency of the profit formation system.

This can be established by comparing the costs associated with the use of the entire system of financial resources, and costs in order to extract the minimum or maximum profit. The matrix form (Table 1) gives an idea of the costs and the formation of the minimum or maximum profit obtained as a result of various combinations of financial, labour and material resources.

Table1. *Matrix of costs and profits of the enterprise*

	System profit					
		$\sum PR_1$	$\sum PR_2$	…	$\sum PR_m$	$\sum PR_n$
System costs	$\sum Ce_1$	SEl_{11}	SEl_{12}	…	SEl_{1m}	$\sum SEl_n$
	$\sum Ce_2$	SEl_{21}	SEl_{22}	…	SEl_{2m}	$\sum SEl_{2i}$
	…	…	…	…	…	…
	$\sum Ce_n$	SEl_{n1}	SEl_{n2}	…	SEl_{mn}	$\sum SEl_{ni}$
	$\sum Ce_3$	SEl_{j1}	SEl_{j2}	…	$\sum SEl_{jm}$	$\sum SEl_{jn}$

Here are: $\sum Ce_1 ; \sum Ce_2 ; \ldots ; \sum Ce_n$ - costs corresponding to the combination of financial resources;

$\sum PR_1 ; \sum PR_2 ; \ldots ; \sum PR_n$ – profit from the use of appropriate combinations of financial resources;

$SEl_{11}; SEl_{12}; \ldots ; SEl_{1m}$ - structural units (elements) of the financial resources system formed from profit;

$\sum SEl_{j1}; \sum SEl_{j2}; \ldots ; \sum SEl_{jm}$ - sum over the corresponding rows, columns of the matrix;

$\sum(\sum Ce_3, \sum SEl_{jn})$ –the total amount of costs available within the profit system (for the formation of additional profit or additional profit from the use of financial resources).

The aggregate of the total profit and costs makes it possible to establish the efficiency and competitiveness of the enterprise functioning, the aggregate of funds mobilized to cover the costs of the enterprise. Employees responsible for the financial work of enterprises, first of all, must have a clear idea of the investing resources purpose and, in accordance with them, give recommendations on the forms of raising funds in order to generate profit in general[20].To cover the short-term and medium-term needs for funds, it is advisable to use loans (both short-term and long-term) from banks.

When making large capital investments in the reconstruction and expansion of the enterprise, you can use the issue of securities. However,

such a recommendation can only be given if the financial experts responsible for financial operations.

Under the regime caused by the coronavirus pandemic, other models of partial increase in profits can also be used, due to one or another combination of enterprise activities, a combination of freedoms or restrictions in relation to certain types of enterprise activities[21]. In each individual case, they are determined by the location of enterprises in the system of economic ties, their specific economic opportunities. For example, hotels, restaurants, catering establishments under quarantine partially or completely suspended their activities, although they were under the protection of the state (the state, in principle, did not allow them to declare bankruptcy, taking into account the existing conditions and restrictions). In such cases, financial or other types of support for enterprises and their production activities within the framework of their production costs becomes the main source of increasing income and increasing the competitiveness of the enterprise. At the same time, the reliability of cost accounting (or calculation) depends on the choice of expense items, accounting and calculation objects, calculation units, methods of distribution of indirect costs.

Regarding the calculation, it should be noted that by it we mean the products (work, services) of the enterprise, its divisions, technological conversions, phases, transitions, stages, the cost of which is calculated[14].A costing unit can be considered a product measure adopted for calculating the cost of the corresponding costing object. The costing unit must be stable over time, comparable for different enterprises, corresponding to the units of pricing; acceptable to ensure the accuracy of the calculation at the lowest cost; reflecting the use value of products and the possibility of making a profit. Then the method of accounting for production costs and calculating the cost of production is a set of methods for collecting, grouping in accounting for information on production costs and calculating the actual cost of production to control the costs of enterprises.

3. Results

The analysis of calculation methods and their use allowed us to conclude that a simple (processor-based) accounting and calculation method is used mainly in processing industrial enterprises and in some processing industries that produce simple homogeneous products (for example, power plants).

The essence of the method is to take into account the costs of the entire production output. As a rule, there is no work in progress, which leads to the equality of costs and production costs among themselves. The unit cost is calculated by direct calculation, i.e. by simply dividing the costs by the volume of production in natural or conditionally natural terms.

Thus, it can be argued that cost accounting and calculation remain the most important both in the system of financial, tax and management accounting, reflecting the most significant changes in the methodology for determining the total costs and profits of enterprises.

Conflicts Of Interest

No conflict of interest was declared by the authors.

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CRITICAL SUCCESS FACTORS OF QUALITY MANAGEMENT AND SMART MANUFACTURING IMPLEMENTATION AND ITS IMPACT ON CUSTOMER SATISFACTION IN MANUFACTURING MSMES OF TAMIL NADU.

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ABSTRACT

Smart Manufacturing in manufacturing industries ensures superior quality products and it can be evaluated in the terms of performance. It is an ongoing process of improving identifying and removing errors and streamlining the production line to improve customer experience. Four major critical success factors were identified through an extensive review for manufacturing MSMEs; customer-centric approach, Managing processes, quality policies, and continuous improvement. The impact of these success factors on customer satisfaction is studied by a survey using a questionnaire. Data was collected from 421 manufacturing Micro, Small, and Medium Enterprises (MSMEs) from Tamil Nadu. Study results show that the critical success factors are significantly related to customer satisfaction. Results are significant for researchers and industrialists to evaluate the smart manufacturing implementation and its influence on customer satisfaction.

Keywords: *Total Quality Management, Smart manufacturing, MSMEs, Customer satisfaction, Structural equation modelling, Business Process, Quality systems, Sustained growth, India.*

Introduction

Industry 4.0 is a concept in the manufacturing sector and it covers a wide range of applications in varied industries. Quality management takes into consideration all activities and tasks that arerequired to maintain a required level of excellence. Quality management ensures producing and employing quality planning and assurance, to provide the determination of a quality policy, quality control, and quality improvement.

Smart manufacturing (SM) is a technology-driven approach as it uses network-integrated machinery to monitor the manufacturing process. It brings out opportunities for automating processes and operations, and it uses data analytics to improve performance.

Due to advancements in recent emerging technologies, there is a need for transformation in processes and production systems to become flexible, smarter, and automated to meet the increasing competition in business(Lee et al., 2014)

Adoption of Quality management practices and implementing smart manufacturing techniques will help in achieving customer satisfaction, employee relations, quality, and business(Dr. Devendra S Verma & Mr. Ajit Rathod, 2014).

According to MSME Ministry, in 2021, India has approximately 6.3 crore MSMEs. MSME contributes about 7-8 percent of the nation's GDP, 45 percent of the total manufacturing output, and 40 percent of the total exports.

By adopting smart manufacturing, MSMEscan reap benefits such as reduced Costs, Enhanced customer relationship, increase in revenue, transparency in the production system and production processes, processes standardization, Maintenance, decreased inventories, Improvements in the health and safety of workers, Energy, and environmentally sustainable production systems, Effective use of human and improved health and safety for workers.

Smarter manufacturing operations make better products, more efficiently, which raise customer loyalty, which makes business and it comes down to customer satisfaction

This study aims to understand the critical factors influencing the implementation of smart manufacturing in MSMEs and its impact on customer satisfaction. This study develops a model to understand their relationships and their effects.

Literature Review

From the review of literature, it is evident that very little research has been done on the area of quality management and smart manufacturing implementations in Indian manufacturing industries. Considering the lack of studies, it is challenging for MSMEs to obtain information on the implementation of quality management and smart manufacturing. This research bridges

the gap by identifying major critical factors and their implementation of the total outcome that is customer satisfaction.

Quality management and Smart manufacturing implementation

Integration of quality systems, process management, and pressure due to competition were significant factors influencing the implementation process (Subramanian et al., 2021). Operational, social, strategic, and environmental opportunities are drives of implementation and continuous improvement and competitiveness were challenges and it depends on the characteristics of the company (Müller et al., 2018).

Customer-centric approach

Customer relationship management does not affect a firm's performance directly. However, it is mediated by product, process differentiation, and leadership (Reimann et al., 2010). There is an influence of customer focus on marketing performance of the organization and customer performance with moderating factors will lead to business performance (Nwokah, 2009; Nwokah & Maclayton, 2006)

Managing processes

Companies with high process flexibility are likely to benefit when compared to low process flexibility in predicting customer satisfaction (Zhang et al., 2009). Customers prefer to do business with companies where quality management and smart manufacturing are implemented and it serves as an empowerment to the employees of the organization (Monareng et al., 2017).

Quality Policies

Quality conformance and customer satisfaction are two distinctive paths but have a direct influence on one another (Forza & Filippini, 1998). Quality management is important to achieve quality and customer satisfaction by incorporating primary and secondary aspects including Leadership, HRM, Employee commitment, job satisfaction, and Management information system (Lenka et al., 2010). Quality management and smart manufacturing increase customer satisfaction in the long run irrespective of the industry and cultural differences(Mehra& Ranganathan, 2008).

Continuous improvement

Productivity improvement and customer satisfaction have a positive effect on quality management practices(Terziovski, 2006). Continuous improvement is a strategy for radical innovations to initiate critical products, services, and processes which helps the manager in achieving system integration(Terziovski, 2002).

Customer satisfaction

There is a significant and positive relationship between quality management practices and customer satisfaction levels (Anil & Satish, 2017). Process improvement focuses on improving manufacturing and engineering-based approaches towards quality management. There is a gap between quality needs and customer satisfaction (Herrmann et al., 2000).

Summary of supported studies

Critical factors	Supported studies
Customer-centric approach	(Desatnick & Robert L., 1992)(Anderson et al., 1998)(Sun & Cheng, 2002)(Beer, 2003)(Shokouhyar et al., 2021)(Venumuddala et al., n.d.)(Rodriguez-Conde et al., n.d.)(Management & 2020, n.d.)
Managing process	(Boegh et al., n.d.)(Shewhart, 1931)(Saraph et al., 1989)(Samson & Terziovski, 1999)(Alatrista-Corrales et al., 2021)(Hofer et al., n.d.)(Ganesh et al., n.d.)(Urgese et al., n.d.)
Quality policies	(Sankar et al., n.d.)(Wu, 2021)(Maina et al., 2020)(Ramazanova et al., 2019) (Javaid et al., n.d.) (TANG et al., n.d.)(Acerbi et al., n.d.)(Research & 2020, n.d.)
Continuous improvement	(Lizarelli et al., 2019)(Vinodh et al., 2021)(Arief et al., n.d.)(Vinodh et al., 2021)(Sunder M & Prashar, 2020)(Contreras-Choccata et al., n.d.)(Solís-Quinteros et al., n.d.)

Hypothesis

Hypothesis framed for the study based on the review of the literature.

H1- Customer-centric approach is significantly related to customer satisfaction.

H2- Managing processes are significantly related to customer satisfaction.

H3- Quality policies are significantly related to customer satisfaction.

H4- Continuous improvement is significantly related to customer satisfaction.

Research Methodology

Instrument Development

An initial instrument for measurement was created using an extensive review of literature mostly from (Black & Porter, 1996)(Reinaldo et al., 2020)(Moeuf et al., n.d.)(TRANG et al., 2020)(Reinaldo et al., 2020). The current study is different from the related studies as it compares the factors of implementing smart manufacturing practices along with the quality management in the manufacturing MSMEs.

A structured questionnaire was framed and a five-point Likert scale was used in the study to identify the range in the respondents. Secondary data from the published annual reports of the Ministry of MSME and Department of MSME, Tamil Nadu is used for obtaining detailed information on the manufacturing MSMEs in Tamil Nadu.

This Questionnaire included questions to address the general information of the companies and questions to evaluate the extent of quality management and smart manufacturing implementation factors within the manufacturing MSMEs.

Sampling

The list of MSMEs from Tamil Nadu engaged in the business of manufacturing Machinery, parts, and ancillary parts for textile companies used in spinning machines, dyeing machines, Yarn manufacturing, weaving machines, textile printing, and knitting machines were considered for the study. The list of companies was populated from Udayam registration under the Ministry of MSMEs. MSMEs in Coimbatore, Erode, Tiruppur, and Salem were considered as they have large numbers of textile machinery manufacturing industries.

Total Number of MSMEs registered in Tamil Nadu under Textile Machinery manufacturing 1088[1]. The total number of MSMEs registered in the study area is 768.

According to (Kline, 2014) the typical sample size where structural equation modeling is used is about 200 cases. However, 342 samples were collected for the study using a proportionate random sampling technique.

Methods of Analysis

Reliability Analysis

Construct reliability was tested using Cronbach's alpha(Cronbach, 1951) and values higher than 0.70 indicate high reliability (O'Leary-Kelly & Vokurka, 1998). As all Cronbach's alpha values are above 0.70, the results suggest that all the constructs are highly reliable.

Table 1: Reliability Coefficient

Factors	*Number of Items*	*Cronbach's alpha*
Customer-centric approach	6	.812
Managing processes	5	.847
Quality Policies	6	.824
Continuous improvement	6	.784
Customer satisfaction	5	.829

6.2 Structural Equation Modelling

Structural equation modelling was done using SPSS-AMOS. (Shi & Maydeu-Olivares, 2019)CFI, RMSEA, X^2/df, NNFI, and PGFI are the indices used in the study.

Table 2: Goodness of Fit indices

Goodness of Fit statistic	*Value of fit index*	*Recommended value*	*Reference*
X^2/df	2.73	<3.0	(Tabachnick et al., 2007)
CFI	.957	>.9	(Hu & Bentler, 1999)
NNFI	.906	>.9	(Hu & Bentler, 1999)
AGFI	.574	>.5	(Shevlin & Miles, 1998)
RMSEA	0.073	<0.08	(MacCallum et al., n.d.)

[1]During the study period Feb 2021

Structural Equation Model

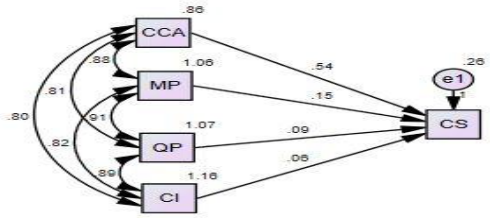

Table: 3 Standardized regression estimates

Path	*Estimate*	*Significance*	*Hypothesis*	*Result*
Customer-centric approach → Customer satisfaction	.538	***	H1	Accepted
Managing process → Customer satisfaction	.169	.054	H2	Rejected
Quality Policy → Customer satisfaction	.097	.160	H3	Rejected
Continuous improvement → Customer satisfaction	.072	.205	H4	Rejected

Results

It could be observed from Table No.3 that there is a significant impact of the customer-centric approach on customer satisfaction, the estimates are 0.538 and p-value is less than 0.05 and there is no significant impact of Managing process, Quality policy, and continuous improvement on customer satisfaction. The R-square value is 0.707 which explains 70.7% of the variance in customer satisfaction.

Conclusion

From the results of the study, it is evident that the customer-centric approach as a factor influencing implementation of quality management and smart manufacturing has a direct effect on customer satisfaction over other influential factors. MSMEs may implement more customers focused and customer-oriented manufacturing techniques by improving feedbacks and understanding competition and market conditions. This study potentially contributes to the existing literature as the contextual factors and research design used in the study are new and there is a huge scope for further replication of the study with new factors.

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ROLE OF ARTIFICIAL INTELLIGENT CHATBOTS IN SUSTAINABLE RECRUITMENT WITH RESPECT TO IT SECTOR IN SOUTH INDIA

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ABSTRACT

Organisations are moving ahead to sustainability in this global scenario. Sustainable HRM practices are the essential factors for attaining competitive advantage today. One of the prominent practices that business tries would be comprehensive recruitment strategies which gains momentum. Technological innovations lend hand in varied ways to combat the challenges of framing new strategies in recruitment. Recent drifts in recruitment strategies involve social media recruiting, internal referrals, augmented recruitment, gamification in recruitment, artificial intelligence and many more. This paper tries to bring out the significant role of using Artificial Intelligence(AI) in recruitment. The routine of recruiters include finding qualified applicants from the pool of resumes, interview scheduling, interview process, selection & on-boarding activities and to fit them in the right place. This daily routine can be made effective & efficient with the use of AI Chatbots. This paper also supplements that artificial intelligent chatbots are very effective techniques which need to be implemented in recruitment process as it automates the whole process and eases the job of a recruiter. This study was conducted among 135 IT HR Professionals in South India. The authors have used correlational analysis to test the facilitated hypothesis. The research study highlights the importance of recruitment as a sustainable human resource practice.

Key words:Chatbots, recruitment, Sustainability, Artificial intelligence, AI

Introduction

Technological inclinations add superfluous anxiety on organizations to continuously acclimate change in order to reserve their competitive advantages. Varied modern methods have been revolutionised to combat the daily challenges. One such method would be the usage of Artificial Intelligence (AI) in Human resource functions. The utmost dare lies in the laying the comprehensive recruitment strategy. Recruitment is defined as a psychological process of attracting, selecting & retaining talents. Recruitment process includes framing an effective job description, sourcing, screening & interviewing talents ***(Hekkala, 2019).***Talent acquisition plays a vivid role in administering the human resources of the organisation.According to ***(Benfield, 2017)*** HR professionals spend more hours in reviewing resumes from applicant pool in which about 80% of the resumes gets rejected. This supposes to be a time consuming process and organisations are finding different techniques to reduce the time, cost & bias of recruitment which is the major flaw in recruitment strategy. This research study tries to bring out the effectiveness of recruitment through Artificial Intelligent Chatbots.

Literature Review

2.1 Sustainable Human Resource Practise & Recruitment.

The concept of sustainable practise came into force fromBrundtland Commission in 1987 which states that sustainability is "progression that encounters the needs of the present without conceding the ability of future generations to meet their own needs". To combat the sustainable development business organisations are trying to adopt numerous methods to apply in almost all functional activities including HR & Marketing. (***Enhert,2009)*** in her book sustainable human resource practice argues that competitiveness of an organisation is reinforced by sustainable HRM. On this context in order to meet the current challenges, comprehensive recruitment strategy needs to be identified as a sustainable human resource practice.

Recruitment is defined the process of sourcing, screening & selecting right employees at the right time. It can be rightly said as to stimulate candidates to apply for the job ***(Biswas2012).(Ahmed, 2018)***states that Conventional recruitment is not efficient currently since its time consuming and it does not always lead to optimum results.Also biasness has become one of the major factor in

recruitment process***(Smith, 2017).*** As researched by ***Boxall, Purcell and Wright (2008***) the firms' recruitment strategies are the most perilous strategies concerned among the human resource activities, in order for them to survive and succeed in a competitive environment.According to ***Windolf (1986),*** the optimal of a specific recruitment strategy by a business is precise to the resources available to the organization at hand and its ecologicalchanging aspects.To the rescue, these barriers can be overcome through technological inventions such as Artificial Intelligent Chatbots. This is being supported by the studies conducted by ***(Anitha.K&Dr.V. Shanthi,2020)***where the researchers concluded that Artificial Intelligent techniques serve to be a moderator in enhancing the sustainable human resource practices such as recruitment, psychological contract, employee well-being on organisational growth.

2.2 AI Chatbots

The term Artificial Intelligence was introduced by John McCarthy in 1956 in a conference where he led the benefits of Artificial Intelligence in varied disciplines including psychology, human resource management, engineering & medicine. AI is flexible and can automate tasks, which requires less or no creativity, having algorithms which are an organized technique for solving a problem (Chichester &Giffen, 2019).AI often refers to a class of technologies, whose goal is to replicatehuman cognitive processing (***Flasinski, 2016***).Insupport of HRM, the National Aeronautics and Space Administration (NASA) found that theuse of AI enhanced HR processes allowed them to complete 86% of HR tasks withouthuman intervention ***(Davenport and Ronanki, 2018).***
One prominent Human Resource function that is more likely to clinch technological innovation and transformation is Recruitment ***(Reilly, 2018).***In recent times, a recruitment and selection practice has been wedged by artificial intelligentchatbots who played a significant role to change the orthodoxapproaches of selecting employee's selection by making it more digitallyreliant on ***(Hmoud et al., 2019).Hatwar et al. (2016)*** define chatbots as software agents that mimic an object, usually a human counterpart of imprecise characteristics, with whom the user can interact in a conversation (either written, oral, or mixed). All chatbot programs comprehend one or more human languages by using Natural Language Processing or Artificial Intelligence Markup Language ***(Khanna et al.,2015).*** Research studies conducted by***(Anitha.K& V. Shanthi, 2021)***elucidate the importance of using chatbots in recruitment process. They have also mentioned about the various types of chtbots being used around the globe.

Methods

3.1 Statement of Problem

AI has been increasingly applied globally resulting in great chances to change the way of working in Human Resources, and specially with reference to recruitment ***(Schweyer, 2016; Vedapradha, et al., 2019).***On context to the above statement, the authors have raised the following questions.
1. How well is the effectiveness when AI Chatbots is been applied to recruitment process?
2. Is recruitment a sustainable human resource practice?
3. Is there any effect inusing AI chatbots& demographic variables?
With the above literature review and research questions, the following hypotheses were framed.
H1There is a positive association between Gender & usage of AI chatbots.
H2 There is positive association between Educational Qualification & usage of AI chatbots.

3.2 Methodology

The research data was collected from 135HR Professionals from IT industry using a structured questionnaire. Correlational analysis was enabled using IBM SPSS 23 to analyse the collected data. Cronbach's Alpha test was conducted to check the reliability of the data. The results test is presented in Table 1.

Table 1: Cronbach's Alpha Reliability test

Instruments	Cronbach's Alpha	No.of Items
Sustainable Recruitment	**0.739**	**6**
Chatbotin Recruitment	**0.869**	**6**
Recruitment Effectiveness	**0.901**	**8**

3.3 Conceptual Model

Research studies conducted by***(Merlin & Jayam,2018)***emphases on the divergences in HRM practices like talent acquisition & retention, training & development with the progress of Artificial Intelligence and its anticipated that this impact is more generousprospect. Technology has constantly held an inspiration within the recruitment scene, decreasing costs andbringing increased effectiveness in recruiting candidates ***(Okolie, 2017).***With the above context, the authors would like to research about the role of AI chatbots in recruitment process to attain effectiveness. The authors have framed the conceptual model as in figure 1 with respect to the above context.

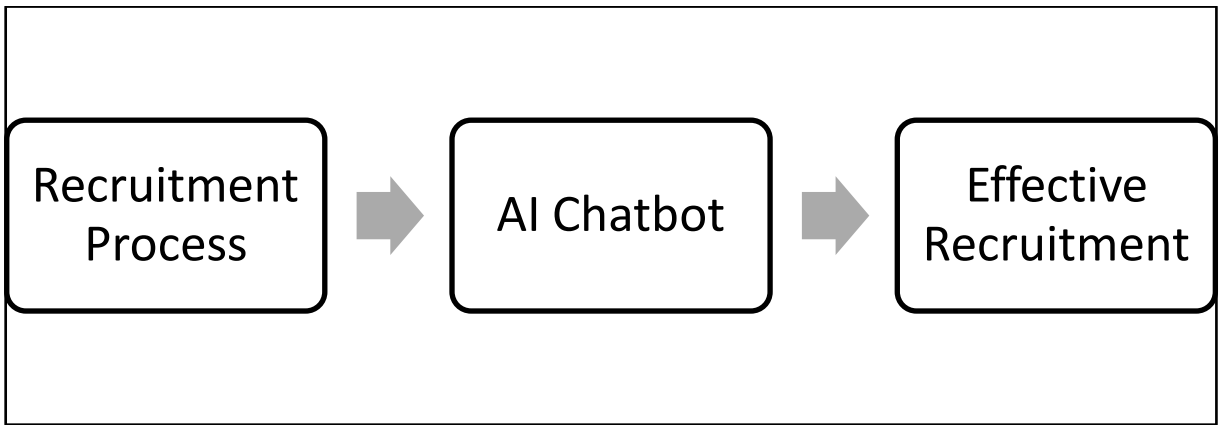

Figure1: Conceptual Model

3.4 Research Analysis

3.4.1 Respondent Profile

Descriptive analyses were engaged to classify the respondent's demographics percentage. The analysis results are displayed in Table 2. From the table.2 respondents profile reveals that male respondents were 53.3% and female respondents were 46.7%. 40% of the respondents fit to the age group of 20-30 and 48% of the respondents fit to the age group of 30-40. The educational qualification of the respondents included 13.3% of undergraduates and 74.8% of postgraduates. The sample was collected from HR Managers, HR Executives, HR Assistants and trainees. The respondents belonged to South India, accounting 53.3% from Chennai, 10 % from Bangalore, 20.7 % from Hyderabad and 20.7% from Coimbatore.

Table 2: Results of Descriptive Investigation

Items	Description	Frequency	Percentage
Age	20-30	54	40
	30-40	65	48.1
	40-50	12	8.9
	Above 50	4	3.0
Gender	Male	72	53.3
	Female	63	46.7
Qualification	Undergraduate	18	13.3
	Postgraduate	101	74.8
	Ph.D.	16	11.9

Designation	HR Manager	61	45.2
	HR Executive	13	9.6
	Sr. HR Executive	17	12.6
	Trainee HR	4	3.0
	HR Recruiter	26	19.3
	HR Assistant	14	10.4
City	Chennai	72	53.3
	Bangalore	14	10.4
	Hyderabad	28	20.7
	Coimbatore	21	15.6

3.4.2 Recruiters Opinion on Recruitment as a Sustainable Human Resource Practice

The opinion outcomes of the respondents are displayed on Chart 1. It is observed that 59.3% of the respondents strongly agree that recruitment is not just hiring but sourcing a potential talent for the future of the organisation. 52.5% of the respondents agree that using collective recruitment methods definitely fetches the right talent for the organisation. About 53.3 % of the respondents agree that selective hiring is the need of the hour. With the above opinion it can be concluded that, recruitment does serve for the sustainable growth of the organisation and thus, it can be considered as one of the sustainable human resource practise.

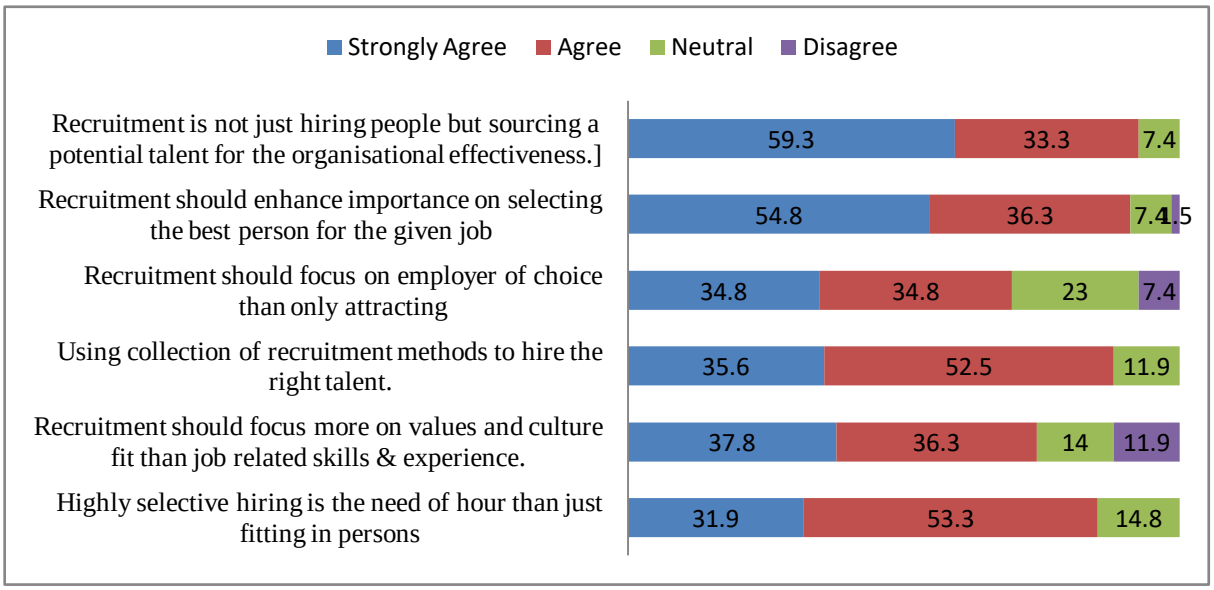

Chart 1: Recruiters Opinion on Recruitment as a Sustainable Human Resource Practice

3.4.3 Respondents opinion to substantiate the use of AI Chatbots in Recruitment

The opinion outcomes of the respondents are displayed on Chart 2. It is observed that 60% of the respondents agree that using AI Chatbots will automate the recruitment methods. 58.5% of the respondents agree that AI Chatbots help the recruiters in on-boarding work. About 59.3 % of the respondents agree that AI chatbots play a prominent role in assessing the best match between an applicant and organisation. AI Chatbots also play a significant role in candidate engagement & candidate experience. With the above opinion it can be concluded that, use of AI chatbots in recruitment, definitely eases the daily monotonous work of HR recruiters

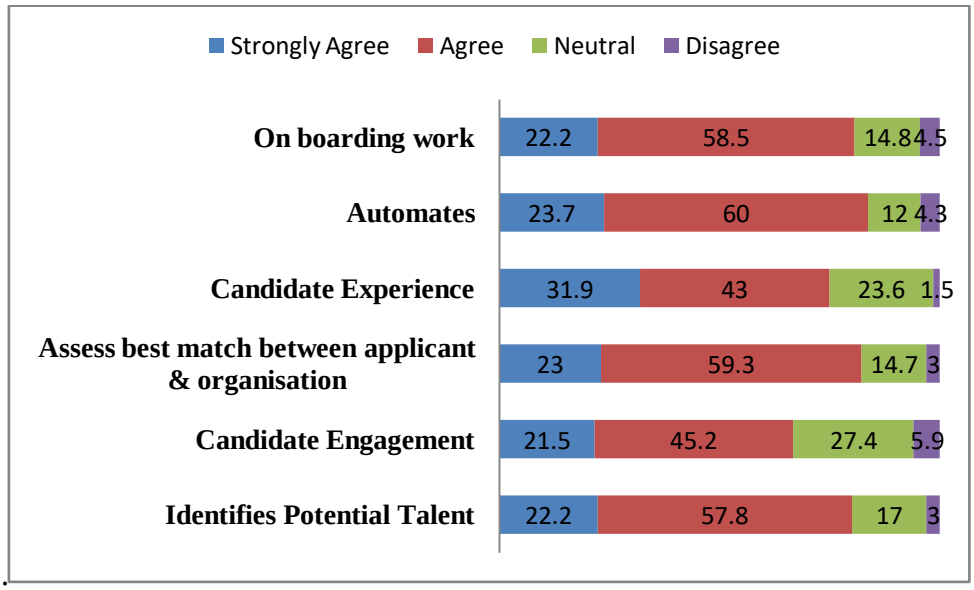

Chart 2: Respondents opinion to substantiate the use of AI Chatbots in Recruitment

3.4.4Chi square analysis to substantiate AI Chatbots& Demographic variables.

H1 There is a positive association between Gender & usage of AI chatbots.

The association between two variables can be best examined through correlational analysis and the results are presented in Table 3.

Table 3: Results of Correlational Analysis

Correlations			
		Gender	**AI Chatbots**
Gender	Pearson Correlation	1	.250**
	Sig. (2-tailed)		.003
	N	135	135
AI Chatbots	Pearson Correlation	.250**	1
	Sig. (2-tailed)	.003	
	N	135	135
****. Correlation is significant at the 0.01 level (2-tailed).***			

They demonstrate that there is a progressive relationship between Gender and using AI Chatbotsas it is positively correlated *(p value = 0.003, p<0.01)*. Therefore it is evident that gender plays a vivid role, in preferring to use AI Chatbots in recruitment.

The association between two variables can be best examined through correlational analysis and the results are presented in Table 4.

H2 There is positive association between Educational Qualification & usage of AI chatbots.

Table 4: Results of Correlational Analysis

Correlations			
		Educational Qualification	**AI Chatbots**
Educational Qualification	Pearson Correlation	1	.502**
	Sig. (2-tailed)		.000
	N	135	135
AI Chatbots	Pearson Correlation	.502**	1
	Sig. (2-tailed)	.000	
	N	135	135
****. Correlation is significant at the 0.01 level (2-tailed).***			

They demonstrate that there is a progressive relationship between Educational Qualification and using AI Chatbots as it is positively correlated *(p value = 0.003, p<0.01)*. Therefore it is evident that gender plays a vivid role, in preferring to use AI Chatbots in recruitment.

Conclusion

The contemporary recruitment process has not drastically transformed in eras ***(Singh, 2017)***.This has to be taken into account to make the recruitment process in an efficient & effective way. These changes can be implemented with technological innovations. As acknowledged by ***(May, 2016)*** AI is "game-changing for HR".AI will recreate the entire Human Resource operations and the recruitment process is the first facet to change. As a result, in the next 5 years there will be noteworthy structural changes needed to implement AI in recruitment for better sourcing resumes, candidate experience, engagement and creating a competitive advantage over other talent teams, thus making recruitment as sustainable human resource practise.

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A STUDY ON THE PERCEPTION AND ATTITUDE OF YOUTH TOWARDS ACCEPTANCE OF E-PHARMACY AND SUSTAINABLE CONSUMPTION

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ABSTRACT

In this fastest growing era, it has nearly turned into a standard for people to adapt, use and value the convenience of the internet in everyday lives. Internet technology has changed the system of purchasing or consuming behavior of many people in their day-by-day utilities, especially during this pandemic period. The attitude towards online shopping has increased positively as people are preferring more flexible and easy means of purchasing. One of the latest trends of Indian customers in the field of online shopping is purchases of pharmaceuticals by the means of online portals, like websites and phone applications. With this increasing pattern of purchasing medicines online, the number of online pharmacies is also gradually increasing during this period of pandemics. These online pharmacies have created greater opportunities to consumers to order various kinds of medicines online which are easily accessible with discounts and offers and also provide on-time doorstep delivery for convenience and suitability to people with limited mobility. It has made easy accessibility to all the consumers and enhancement of many websites that sell varieties of medicines according to the preference and needs of the people. In this modern era, E-pharmacy provides consumers with more privacy than traditional doctors or pharmacy stores. Online pharmacies are also approaching for those with medical conditions in which people wish to keep private and they do not want any human interaction. The exchange of medicines is strictly regulated, which sets requests for online pharmacies and particularly to sell doctor prescribed pharmaceuticals online. As a result of these demands, the buying procedure and the online store design contrast from the normal online stores, which may likewise affect customer's adoption and readiness to utilize the online channel. This research study is an attempt to understand the perception and attitude of youth towards acceptance of e-pharmacy and sustainable consumption.

Keywords: *E-Pharmacy, Perception, Attitude, Sustainable, Consumption, Youth*

Introduction

In this fastest growing era, it has nearly turned into a standard for people to adapt, use and value the convenience of the internet in everyday lives. Internet technology has changed the system of purchasing or consuming behavior of many people in their day-by-day utilities, especially during this pandemic period. The attitude towards online shopping has increased positively as people are preferring more flexible and easy means of purchasing. One of the latest trends of Indian customers in the field of online shopping is purchases of pharmaceuticals by the means of online portals, like websites and phone applications. With this increasing pattern of purchasing medicines online, the number of online pharmacies is also gradually increasing during this period of pandemics. These online pharmacies have created greater opportunities to consumers to order various kinds of medicines online which are easily accessible with discounts and offers and also provide on-time doorstep delivery for convenience and suitability to people with limited mobility. It has made easy accessibility to all the consumers and enhancement of many websites that sell varieties of medicines according to the preference and needs of the people. In this modern era, E-pharmacy provides consumers with more privacy than traditional doctors or pharmacy stores. Online pharmacies are also approaching for those with medical conditions in which people wish to keep private and they do not want any human interaction. The exchange of medicines is strictly regulated, which sets requests for online pharmacies and particularly to sell doctor prescribed pharmaceuticals online. As a result of these demands, the buying procedure and the online store design contrast from the normal online stores, which may likewise affect customer's adoption and readiness to utilize the online channel.

Online marketing is a set of tools and methods used through the internet to promote products and services. Online marketing comprises a

wider range of marketing elements than traditional business marketing as the additional channels and marketing mechanisms are available on the internet. There are also many advantages and challenges associated with online marketing, which mainly uses digital media to attract, engage and convert virtual visitors to consumers. Today, anyone with an online company can participate in online marketing at little or no cost by creating a website and building customer acquisition campaigns (Optimizely, 2018). E- pharmacies are new entrants to the Indian e- commerce industry landscape, with its increased attention in the last three to five years from government and investors. Today, the e- pharmacy market potential is worth more than a Billion dollar with more than 30 start- ups in various regions of India contributing to the growth of this segment (Maji, 2020).

E pharmacy is a pharmacy which provide customers the opportunity to buy medicines through internet. They deliver the prescribed order to the customer through home delivery. These online pharmacies sell the medicines for those who have prescription but some e-pharmacies sell the medicines even without the prescription. In some countries they sell the medicines without prescription because customers want to avoid the cost and inconvenience of visiting the doctor or to purchase the medicines that the doctors are not willing to prescribe (V.P. & B.K., 2016).

Online pharmaceutical becomes the next battlefield for e- commerce players who want to create a high- frequency play in India. E-commerce offers a better way of transacting for the pharmaceutical industry to achieve competitive advantage and sustainable growth. E-commerce has a significant impact on business- to- business applications when a diverse group of companies, particularly in the pharmaceutical industry, are involved in the decision- making process.

Statement of the Problem

Individuals can carry out various transactions and can obtain information on any topics needed. Such innovation in online purchases is providing a way to people by educating and guiding the direction of their health. Indians have already influenced and are adopting the behavior of buying online products which made the consumers more ease and comfortable. Nowadays, e-pharmacy is creating a boom in the online market. This is prominently seen during the period of pandemic-COVID 19.

The online pharmacy is the most vast and organized retail with many risks involved. There are various websites across the country but many people in India are dependent upon the retail pharmacy. There are certain dangers that are prevailed by the consumers are self-diagnosis and self-medication as consumers can get the prescribed medicine without communicating with a pharmacist or physician. Patients are preferring to treat themselves rather than waiting for a doctor or the patient may feel uncomfortable discussing the health problem with the doctor. The information provided by the consumers to the online pharmacies may not be safe and secured. Through this research, an attempt is made to understand the perception and attitude of youth towards acceptance of e-pharmacy and sustainable consumption. The research also focuses on how young consumers are behaving towards purchasing E-Pharmacy products.

Objectives of the study

1. To study the consumers perception towards the acceptance of e-pharmacy in Bengaluru City in India.
2. To study the consumers attitude towards the acceptance of e-pharmacy in Bengaluru City in India.
3. To examine the levels of acceptance and adoption of online purchases with special reference to pharmaceutical products and sustainable consumption.

Relevance of the Study

As technology is upgrading in India and people are more immersed and well versed in using internet, there is increase in purchase of products through online. Through this research paper we get to know the Indian young consumers perception and attitude towards e-pharmacy as it is necessary for an online application and strategies. It is important to spread awareness as how e-pharmacy is growing and creating a huge difference in online marketing and also to intimate the

problems faced during the purchase and the drawbacks for not using it. This research helps e-pharmacy industry as providing information to them about modifications to be made and the awareness to be created to the consumers for future purchases especially sustainable consumption.

Hypothesis

Consumers are the hearts of the market. There is no business which run without the consumers. Consumer buying behavior includes customer's attitudes, preferences, aims and choices in regards to the consumer's behavior in the market while purchasing a product or service(Velumani, 2014). The study of buyer behavior draws upon psychology, sociology, and economics of the ultimate consumers. Online sale of pharmaceuticals is a quickly developing phenomenon (Cooperman & Lewitt, 2009). However, in spite of the risks of buying drugs over the Internet, sales keep on escalating. These threats incorporate patient harm from fake or tainted drugs, absence of clinical oversight, and budgetary loss. There is high risk in online medication sources dominate the Internet, and for all intents and purposes no responsibility exists to guarantee safety of purchased products. Critically, search engines also purportedly requiring verification of internet medicine venders who actually permit and benefit from unlawful medication deals from unsubstantiated websites. There are mainly four hypothesis developed to understand the relationship between gender and perceived usefulness, perceived ease, customer attitude and behavioural intension.

H1: There is a positive relationship between gender and perceived usefulness of e-pharmacy.

H2: There is a positive relationship between gender and perceived ease of use of e-pharmacy.

H3: There is a positive relationship between gender and consumer attitude towards using e-pharmacy.

H4: There is a positive relationship between gender and behavioral intension towards using e-pharmacy.

Research Methodology

The type of research used in this research paper is Descriptive and Analytical research. The type of data used in this research paper is Quantitative data. The data was collected by conducting survey through questionnaire and area of survey was Bengaluru city in India. Sources of data included primary and secondary data. Primary data was collected through the response from the questionnaire and the secondary data was collected from the articles published by scholars, Journals, Websites and Books. The sample size was 150 respondents who are randomly selected from the age groups of 21-30 Years. The sampling method used will be simple random sampling technique. Correlation test with correlation coefficient has been used to analyse the data.

Research Framework

The research framework of this research study joins three streams of data system and innovation technology acceptance research. The fundamental thought behind the structure is that social or behavioral goal with respect to the objective framework is controlled by the comparison of the initial beliefs and perceptions gained during the framework utilization.

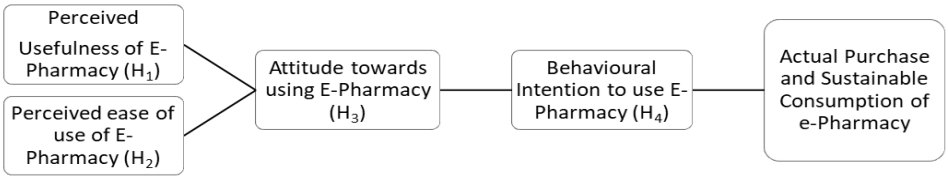

Fig. 1: Research Framework

Review of Literature

Online pharma retail is turning into a battleground for internet business players who are trying to manufacture a high-recurrence play in India. The e-commerce leaders especially the medicine-delivery category shows the importance ways of opportunities given for facilitating regulations and its capability to manage the repeat orders.

According to Alfahad et al., (2015) the knowledge and perception towards online pharmacy services was not a common practice and there were deficits of knowledge and awareness towards purchasing of medicines online. It doesn't mean that they will not accept this, but there are positive reviews on the usage of e-pharmacy in the future. It is mainly according to the consumers convenience as it provides ease of usage, door step delivery, saving of time and reducing of stress. This research study states that awareness must be created among the people about both risks and benefits of online pharmacy (Alfahad et al., 2015).

Online Drug stores are an important phenomenon that is proceeding to spread, in spite of partial regulation, because of intrinsic troubles connected to the intangible and transient nature of the web and its global dimension of (G et al., 2011).

In the research paper of Ndem et al.,(2019) states that the changing consumer behaviour, progression in information technology and reachable and affordable internet are few of the key drivers for the advent of virtual healthcare services including online pharmacies. Each year globally there is an increase in in online purchases of consumer goods and services and especially health related products. (Ndem et al., 2019). Young consumers are adopting online pharmacies and are (Hannula, 2015) displaying high end of demand for online medicines. (Hannula, 2015)

As per the research article by V.P.& B.K. (2016), India has a greater number of youngsters and advanced technology availability of drugs online is very simple. There is mainly lack of laws and regulations for E-Pharmacy. The concerned authorities face lot of difficulties in controlling, tracking and monitoring the sale of drugs and it may lead to dangerous consequences in the future. The main challenges they undergo are low quality, less availability, no legality, low e-tailing penetration and customers are not ready to compromise in the quality and safety of drugs as well as expect quick delivery of medicines (V.P. & B.K., 2016).

In the research article written by Sarin & Gupta (2018), the primary concern is about the health of the consumers as there is increased in the risk of self-medication, misusing of drugs, addiction, no proper storage facility and selling substandard drugs without any rules and regulations. This shows the inculcation of required compliance for right regulatory control and supervise the business. As it's a business to business, marketplace is the intermediate between pharmacies and consumers in respect to offers, prices and the business operation (Sarin & Gupta, 2018).

As per the economic times article, India is making laws and regulations to make the consumers buy the genuine drugs from e-pharmacy. There were certain conditions levied which made them difficult to operate but it also avoids the misuse of consumer belief. All the measures are taken like the business must take license from the Drug Controller General of India; the consumer must not use the same prescription twice at different websites. In case of violation of rules, huge penalty must be paid by the business (Raghavan, 2018).

The Internet has revolutionized in a very exorbitant manner by which individuals lead their regular business. Various web drug stores offer mid night shipping, enabling consumers to dodge the postponement of regular mail. E-pharmacies can offer security that is regularly lacking in a traditional drug store. However, they have to consider the moral standards in the utilization of digital prescription. The development of online pharmacies has provoked administrative and monitoring activities at the federal, state, and expert organisation levels. The sale of online medicines in the international framework is potentially unsafe and requires worldwide regulation (Singh & Kumar, 2011).

Results and Discussion

Demographic Profile:

Table 1: Demographic Variables

Demographic Variables	Classification	Frequency	Percentage (%)
Gender	Male	88	58.7
	Female	62	41.3
	Total	**150**	**100**
Age	21 Years-25 Years	75	50
	26 Years-30 Years	75	50
	Total	**150**	**100**

Source: Primary Data

Summary of profiling of the participants is shown in Table 1. The focus group consisted of 88 (58.7 %) Male and 62Female (41.3%). The table indicates that equal participantswere in the age group of 21-55 years and 26-30 years respectively.

Table 2 showing purchasing medicines through online pharmacy would be safe:

Particulars	No. of respondents	Percentage (%)
Strongly agree	7	4.7
Agree	40	26.7
Neutral	59	39.3
Disagree	36	24
Strongly disagree	8	5.3
Total	150	100

Source : Primary data

The above table (2) shows that 26.7% of the respondents agree and 4.7% strongly agrees that purchasing medicine through online pharmacy is safe, 39.3% of the respondents were neutraland 24% of the respondents disagree and 5.3% strongly disagree that purchasing medicine through online pharmacy is safe. From the table, it is interpreted that majority of the respondents neither agree nor disagree that purchasing medicine through online pharmacy is safe as there are many fraudulent websites that may provide fake company medicines that may affect the patients and also can be overdose or allergic to them.

Table 3 showing the ease of managing and keeping track of medicines through E-Pharmacy application:

Particulars	No. of respondents	Percentage (%)
Strongly agree	11	7.3
Agree	76	50.7
Neutral	44	29.3
Disagree	15	10
Strongly disagree	4	2.7
Total	**150**	**100**

Source : Primary data

The above table (3) shows that 50.7% of the respondents agree and 7.3% strongly agree that it is easy to manage and keep a track of medicines through E-Pharmacy application, 29.3% of the respondents were neutral and 10% of the respondents disagree and 2.7% strongly disagree that it is easy to manage and keep a track of medicines through E-Pharmacy application. It is interpreted that majority of the respondents agree that it is easy to manage and keep a track of medicines through E-Pharmacy application as the websites stores in all the details of the patients as well as the prescription. It can be viewed and reordered whenever necessary and also to track the medicine.

Table 4 showing purchasing medicine online is more convenient:

Particulars	No. of respondents	Percentage (%)
Strongly agree	13	8.7
Agree	48	32
Neutral	53	35.3
Disagree	31	20.7
Strongly disagree	5	3.3
Total	**150**	**100**

Source : Primary data

Table 4 shows that 32% of the respondents agree and 8.7% strongly agree that it is more convenient to purchase medicine online, 35.3% of the respondents were neutral and 20.7% of the respondents disagree and 3.3% strongly disagree that it is more convenient to purchase medicine online.From the above chart, it is interpreted that majority of the respondents neither agree nor disagree that it is more convenient to purchase medicine online as it is in the tip of the finger and there is no stress in going for purchasing but some respondents feel it is time consuming and can be easily available in stores.

Table 5 showing relationship between gender and perceived usefulness:

H1: There is a positive relationship between gender and perceived usefulness of e-pharmacy.

Correlations

		Gender	Safety	Manage and keep track
Gender	Pearson Correlation	1	.182*	.233**
	Sig. (2-tailed)		.025	.004
	N	150	150	150
Safety	Pearson Correlation	.182*	1	.386**
	Sig. (2-tailed)	.025		.000
	N	150	150	150
Manage and keep track	Pearson Correlation	.233**	.386**	1
	Sig. (2-tailed)	.004	.000	
	N	150	150	150

*. Correlation is significant at the 0.05 level (2-tailed).

From the table 5 it is observed that the significance level is 0.025 for safety and 0.004 for manage and keep track which is lesser than 0.05, therefore null hypothesis will be rejected. There is relationship between gender and perceived usefulness of E-Pharmacy. Also, the correlation coefficient is 0.182 for safety and 0.233 for manage and track signifying a weak positive correlation. As per the data shown it determines that there is a relationship between gender and perceived usefulness which highlights that young consumer perceives that it is safe to purchase medicine online and also it is easy to manage and keep a track of medicines through online application. Due to ease of technology and most of the young generations are immersed into the mobile application, it has been more comfortable to use e-pharmacy applications and feel safer.

Table 6 showing relationship between gender and perceived ease of use:

H2: There is a relationship between gender and perceived ease of use of e-pharmacy.

Correlations

		Gender	Convenient.	Better price with discount.
Gender	Pearson Correlation	1	.119	.081
	Sig. (2-tailed)		.145	.324
	N	150	150	150
Convenient.	Pearson Correlation	.119	1	.377**
	Sig. (2-tailed)	.145		.000
	N	150	150	150
Better price with discount.	Pearson Correlation	.081	.377**	1
	Sig. (2-tailed)	.324	.000	
	N	150	150	150

From the table 6 it is observed that the significance level is 0.145 for convenient and 0.324 for better price and discount which is greater than 0.05, therefore null hypothesis will be accepted. There is no relationship between gender and perceived ease of use of e-pharmacy. Also, the correlation coefficient is 0.119 for convenient and 0.081 for better price and discount signifying a weak positive correlation. As per the table it depicts that there is no relationship between gender and perceived ease of use of e-pharmacy, which determines that young consumers are not much convenient towards using online pharmacy and also feels that they do not provide better prices with discount compared to the retail pharmacy. Consumers are more convenient in purchasing the medicines from nearby retail pharmacy as they feel buying medicines online is time consuming.

Table 7 showing relationship between gender and consumer attitude

H3: There is a relationship between gender and consumer attitude towards using e-pharmacy.

Correlations

		Gender	Privacy	More quality
Gender	Pearson Correlation	1	.088	.155
	Sig. (2-tailed)		.286	.058
	N	150	150	150
Privacy	Pearson Correlation	.088	1	.489**
	Sig. (2-tailed)	.286		.000
	N	150	150	150
More quality	Pearson Correlation	.155	.489**	1
	Sig. (2-tailed)	.058	.000	
	N	150	150	150

From the table 7 it is observed that the significance level is 0.286 for privacy and 0.058 for more quality which is greater than 0.05, therefore null hypothesis will be accepted. There is no relationship between gender and consumer attitude towards using e-pharmacy. Also, the correlation coefficient is 0.088 for privacy and 0.155 for more quality signifying a weak positive correlation. The data in the table portrays that there is no relationship between gender and consumer attitude towards using e-pharmacyas consumers perceive that there is less privacy in using E-Pharmacy application and the quality of medicines are low. This is due to the fear that the information provided by the consumers are protected by the e-pharmacy and the medicines received are of better quality with mentioned expiry date on them.

Table 8 showing relationship between gender and behavioural intension

H4: There is a relationship between gender and behavioural intension to use e-pharmacy.

Correlations

		Gender	Time saving	Satisfied with services
Gender	Pearson Correlation	1	.072	.077
	Sig. (2-tailed)		.379	.348
	N	150	150	150
Time saving	Pearson Correlation	.072	1	.516**
	Sig. (2-tailed)	.379		.000
	N	150	150	150
Satisfied with services	Pearson Correlation	.077	.516**	1
	Sig. (2-tailed)	.348	.000	
	N	150	150	150

From the table 8 it is observed that the significance level is 0.379 for time saving and 0.348 for satisfied with services which is greater than 0.05, therefore null hypothesis will be accepted. There is no relationship between gender and behavioural intension to use e-pharmacy. Also, the correlation coefficient is 0.072 for time saving and 0.077 for satisfied with services signifying a weak positive correlation. As per the data in the table 9.8 represent that there is no relationship between gender and behavioural intension to use E-Pharmacy as the consumers do not feel that purchasing medicines online is time saving and the services are satisfied by them as medicines are easily available in the nearby retail pharmacy and purchasing medicine through online is time consuming. So, consumers are not preferring to buy medicines online and are not satisfied with their services as the medicines are not delivered on time and has received expired medicines.

Scope For Further Research

This research is limited to Bengaluru city and it can be studied all over India to know the on the younger aged people as they are more into online purchases and the further research can take place on old generation people as what lacks behind for not preferring E-Pharmacy. This research study is more dependent on the acceptance and adoption of e-pharmacy and it can further be carried out to know the factors influencing the consumer behaviour towards E-Pharmacy and sustainable consumption.

Conclusion

Since e-commerce is developing rapidly, the e-pharmacy industry is also creating a new trade mark in online marketing. Accepting the technology by the consumers in a larger pace is beneficial to the e-pharmacy as to create awareness and making use of the application which makes consumers an easy lifestyle and especially sustainable consumption. The perception and attitude of consumers towards E-Pharmacy in India and sustainable consumption. The research concentrates only current research suggest that online marketing is an effective tool for purchasing medicine online. E-pharmacy has a positive relationship in providing safety and to manage and keep a track of medicines. The study concludes that the youth rely upon e-pharmacy as they feel that it is more convenient to visit nearby retail store rather than ordering online which is time consuming. The younger generation now-a-days are more into usage of internet frequently and purchase products online. E-pharmacy is slowly creating a place for itself in peoples mind as many of the consumers accept buying medicines online and successfully satisfied with it. This group of generation has more influence on e-pharmacy as there is busy schedule for them to visit the stores, the prices are lower and provides more discount compared to the retail pharmacy.

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ARTIFICIAL INTELLIGENCE AND ITS INFLUENCE ON CUSTOMER SATISFACTION – A CONCEPTUAL STUDY

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ABSTRACT

Artificial Intelligence unclosed various ways in different industries – especially in the field of marketing. Customers can purchase, re-sale their products brought with the help of AI-enabled websites and apps of many brands and companies. This conceptual study written from secondary sources cites how artificial intelligence is the answer for efficient customer satisfaction. The paper gives a brief of how artificial intelligence impacts customer services due to digital transformation. The study elaborates that there are many challenges to AI like data security, manipulation, expensive, less awareness, and actual data problem however it can be overcome by integrating the goals of a company with customer needs. AI comes with many benefits like - decision making, problem-solving, gives real-time data of consumers that can be helpful for customer support and services in after-sales services. Detailed statistics show the impact of AI at present, especially in the area of the service industry, and how it will have a larger impact in the future. The purpose of the conceptual paper was to examine from secondary sources the influence of Artificial Intelligence on customer satisfaction in the current market era.

Keywords: *Artificial Intelligence, consumer, satisfaction, review, strategies, chat-bots.*

Introduction

Artificial Intelligence, machine learning, big data analytics all form the subject of a similar coin. All these aspects are interrelated to each other when we speak about artificial intelligence. They all consist of language and algorithms that make systems that can process, implement and solve like human beings. Machine learning designs the structure of artificial intelligence and, big data analytics uses data mining to convert complex information into an understandable form. Various tools of AI are robotics, strategic planning, forecasting, manufacturing and control, web design and development, an advanced system to combat changes in technology. A series of examples can define artificial intelligence like various OTT apps- Netflix, amazon use AI language to systematically cater to their customers' needs where a viewer can watch, download their favourite movies, tv shows. In the very same way, various service industries like Flip-kart, Amazon, Big Basket, and Lens kart provide products and services that can be browsed by their customers with a normal swipe. The use of artificial intelligence in the service industry is by designing their websites with certain languages and algorithms which run following their customers.

Artificial Intelligence was founded in 1956 by John McCarthy during a conference at Dartmouth College and since then evolved as an industrial and research discipline. As we entered Industry 4.0, artificial intelligence play have an important role in industries by its tools, techniques, strategies. It serves as a source of decision making, problem-solving, planning, after-sales support. AI also comes with many challenges.

In the service, industry money is necessary for long-term survival in the changing competitive market. Customer satisfaction is the key to a profitable service industry. Customer satisfaction refers to the ideal way of the service industry to create a long-term impact of its product or service on the customers. To earn high sales satisfying customers is necessary as they give the positive and negative of the product or service. The positive and negative spoken by consumers affects the revenue for the service industry. Continuous satisfaction leads to brand loyalty. Consumers constantly keep checking on reviews or word of mouth from different people before purchasing any product. Recent statistics suggest that nearly 88% of product success depends on the reviews given on the website and how they provide their after-sales services.

The service industry changed rapidly during the current times. The global pandemic caused severe damage to the service brands like restaurants, flight industry. Due to lockdown marketing services like customer support, after-sales service went online which lead to the high application of AI. The service area is providing its products and after-sales support byadvancing its artificial intelligence strategies and techniques. This advancement gives efficiency and allows the workforce to focus on other aspects of customer satisfaction i.e., innovation and research. Service industries like banks have already entered the face of artificial intelligence by making their customers deal with accounts by using their mobile phones. Tools like - chatbots and text bots help customers to perform tasks like document verification, account verification directly from their homes with no physical presence of customers needed in banks. A recent report suggests that by 2022 nearly 85% of banking services will go digital without human involvement.

Review Of Literature

- Anshari, Almunawar, Lim, & Al-Mudimigh,, Bolton et al (2018) in their article "customer relationship management big data enabled: personalization and customization of services" explained that technological tools like Artificial Intelligence, Internet of Things(IOT) and big data analytics has provided optimum digital solutions which enabled in creating a large customer base.
- Gans (2016) in his article "keep calm and manage disruption" explains the present business face is filled with cut-throat competition and the rise of technology has changed the way companies' function.
- Vetterli, Uebernickel, Brenner, Petrie, & Stermann, (2016) in their article "How Deutsche bank's IT division used design thinking to achieve customer proximity" explained how globally customer- centric design is important for any marketing company growth"
- N. Wirth (2018), in his article titled "Hello marketing, what can artificial intelligence help you with" gave a brief of how artificial intelligence is the emerging technology for any service company as it tracks actual data and analyses them in accordance to consumer needs.
- Tjepkema, (2019) in his study "what is artificial intelligence marketing and why is it so powerful?" mentioned AI tools paves the way to identify customer behaviour that can be used for consumer satisfaction.
- Shabbir (2015) in his article "artificial intelligence and its role in near future" concluded that AI technology is useful to identify customer needs and pave way for the future in marketing.
- Davenport (2020) in his article "how artificial intelligence will change the future of marketing?" concluded that artificial intelligence mechanizes marketing processes as it takes real time data, reads customer browsing history with help of programme-based algorithms.
- Davenport (2020) in his article "the potential of Artificial Intelligence in healthcare" briefs that AI tools like machine learning, big data analytics, data mining, Natural Language Processing (NLP) helps to record huge chunk of consumer data which can serve as an asset for future marketing.
- Nguyen and Sidorova, (2018) in their study concluded that chat – bots and Natural Language Processing are an important tool in AI as they help in correcting consumer satisfaction.
- H. Gacanin, M. Wagner, (2019) in their article titled- "Artificial Intelligence paradigm for customer experience management in next generation networks: challenges and perspectives" concluded that AI and ML algorithms helps marketers in decision making.

Objective Of The Study

- Influence of Artificial Intelligence on customer satisfaction in the current market era.

Results And Discussion

This paper is a conceptual paper based on secondary data. The data collected derived from secondary sources were Google scholar, shodhganga, Statista. The information is from different research articles, blogs, online

reviews, and newspapers that provided insights into the emergence of artificial intelligence. A detailed literature review is written on customer satisfaction and artificial intelligence

a) **Artificial Intelligence Statistics**

Impact of AI on industry and personnel	Impact of AI on service industry
In 2022 almost 35 projects of AI are expected to be placed in businesses.	40 % of service industries reported that customer satisfaction is their top priority.
Business activities like invoice and validation has almost 20% impact from use of AI.	Small number of marketers are yet to learn AI technology.
80% of retail industry are expected to adopt AI in all their activities by the year 2027	71% of market industry reported that AI is useful for better personalization with customers.
7% of organizations do not adopt AI and this rate is also expected to change.	In 2020 nearly 80% of services adopted used chatbots to improve customer connectivity.
86% of executives has adopted AI tools and techniques for better productivity.	48% of service industry reported that the use of chatbots improved customer satisfaction.
48% of manufacturing industries use data analytics, machine learning tools and algorithms to answer quality related issues.	The e-commerce industry has made almost 51% of its services using AI in sales, marketing areas.
Due to pandemic nearly 39% of companies made decisions to invest in artificial intelligence.	34% of marketers reported that AI technology is the best innovation they can have for better customer connectivity.
75% of industries are reported to go out of competition if AI is not adapted in their company.	The use of chatbots helped to interact with almost 85% of customers.
In 2020 it was estimated that AI will erase 1.8 million jobs and build 2.3 million new jobs.	27% of customers reported that AI can deliver better than human beings.
By 2025 there will be job demand by companies in areas of automation, machine specialist, data scientist as industries will be automated.	43% of marketers think if AI is not implemented properly will harm the brand as customers loose trust in the product or service.
43% of manufacturing industry has added data analyst, quality specialist in their job descriptions due to which 35% of employees are learnng these elements.	54% of managers and CEO say that implementation of artificial intelligence in their services improved productivity.

b) Impact Of Artificial Intelligence On Customer Satisfaction

Customer satisfaction plays a pivotal role in the marketing industry. Customer satisfaction integrates functions of an organization with customer behavior. The element of any service industry to survive for a long is to create demand and satisfy its customers. How one reacts, reviews, and suggests about the product or service generates revenues for a business. Therefore, a successful business happens not only by creating an excellent product but how you manage to deal with your customer after you provide it to them.

The application of artificial intelligence in customer satisfaction is adding to brand demand and customer loyalty. The use of artificial intelligence tools like chatbots, text bots is revolutionizing the way customers experience. As the pandemic fell upon us, we can say that the service industry's only way of interaction was the application of artificial intelligence in their systems allowing the customers to deal with the product-related problems with automated programs without the presence of human beings. In the year 2020, nearly 85% of the service industry went automated due to the pandemic. Due to social distancing restaurants, stores, brands are using artificial intelligence tools to overcome the barrier of in-person experience by making their services go automated. As we enter Industry 4.0 artificial intelligence is not only benefiting business but also comes with its challenges.

The customer satisfaction loop in artificial intelligence-enabled apps or websites of any store or brand begins with how the customer feels when they enter your website or app. This can be a normal recommendation, email address pop-ups, or else a review after the entire shopping or ordering is done. It also continues with how much variety or choice you give to the customers keeping in mind not only their taste or preference but also their income. The better the application is designed the more customers' opinions become positive towards the brand and their good word of mouth can help bring in more new customers to the

business. If the application of the brand or store does not meet the choices of customers it hampers their experience to use the product. Big market industries now rely on artificial intelligence technology to segments their heterogeneous markets byways like advertising any kids brand on Instagram which is mostly used by generation x and millennials. Customizing any food app by the need of the customer like if a consumer buys biryani from a constant restaurant the app shows the discounts on that restaurant to the customer. Businesses need not depend on the face-to-face or in-hand experience of customers. This step of active usage of artificial intelligence is just paving the way for a digital economy.

AI-enabled consumer experience is used to a wide area of the marketing department for example developing the customer experience with help of reviews or recommendations, enhancing the website or apps problems by simplifying it with constant changes in the website or apps of brands. Artificial intelligence is catering to the service industry to know a huge chunk of customers with the help of seeing into their browsing history, email history, and various other actions. When artificial intelligence was not present businesses had to choose the best marketing strategy for their product or brand. Now AI is helping companies by use of big data analytics and machine learning to understand real customer needs. Organizations can further know the needs and preferences of consumers by keeping a check on their choices.

The presence of artificial intelligence is paving way for self-operating customer service. Self-operating customer service is a company's process to reduce human involvement in providing customer services and a high rate of satisfaction. This self-operating customer service can be used in the following ways:

- **Consumer self-service:** why is consumer self-service important? The real reason behind this is that majority of customers like to solve problems related to any product or service on their own first before connecting to any customer support. It has been reported that nearly 73% of consumers push themselves to solve problems on their own and 64% solve the problems before dealing with any customer support or service centers. A good example can be the section of frequently asked questions on the internet or on websites of many companies, where the majority of consumers try to solve their small or burning questions. The Internet gives a major or partial answer to the problem.
- **Chatbots:** AI comes with many benefits one of them is the active use of chatbots where the customer can directly with the automated text robot and the reply can be received instantly. These chat-bots helps to reduce cost for marketers, the only investment is on the technology. Chat-bots simultaneously save time for consumers as they can receive an instant reply to their doubts or queries regarding the product or service. This increases customer trust and accountability. Does the question arise do consumers want to talk with electronic bots? A recent survey suggests that nearly 60% of users do not wait more than 60 seconds to receive a response to their questions. Chatbots' use of Natural Language Processing helps to give constant replies thus improving customer satisfaction. Chatbots are a part of customer service analytics which means that their metrics can be used to determine customer retention rate, purchase rate, objective rate, and consumer satisfaction rate.
- **Consumer satisfaction:** apart from the use of automatic chat-bots or text-bots AI is raising the bar by customizing its brands according to the needs and behavior of consumers. For example, an e-commerce brand like Amazon is using AI by organizing its app with various choices thereby serving different types of customers. If a consumer wants cloth for work it gives a variety of choices in it and later if any discounts are available recommends by small pop-ups about the offers. This keeps the customer in constant presence on the brand. These huge brands use AI definition and take complex customer data and simplify and identify the preferences of their target market and design and innovate their brand's website or apps accordingly.
- **Consumer feedback:** feedback of customers is an important element of any

business especially in the service industry. It enables brand loyalty and generates revenue for companies. Finding the exact review or feedback on your brand or service is a difficult task thus AI-enabled tools like google forms and descriptive statistics help to gather the reviews by graphic presentation helping marketers to instantly react to the problems. For example, if on the amazon website many reviews mention the words like a time consuming, high price, fewer choices AI-enabled tool will simply and help amazon in understanding that their products are high priced with late service. Some techniques can be as

1. Sentimental analyses
2. Text analyses
3. Customer service analyses

c) Merit Of Artificial Intelligence In Customer Satisfaction

AI improves customer satisfaction of any service business in the following ways:

- **Identify your consumer:** AI helps to improve consumer satisfaction by providing real-time data to businesses. By using big data tools marketers can analyze different types of customers and give a business the relief to identify the customers for them.
- **Higher productivity:** AI enables the service industry to cut down costs and helps in completing repetitive tasks with simplicity. Tools like chat-bots help consumers to rigorously clear their queries and the availability of workers will be less as their answers will be cleared automatically. It unburdens the companies to perform repetitive tasks of consumers. As it uses real-time data companies can look for higher efficiency and simplicity by designing their apps or website following customers. These bots help the business to grow its workforce to concentrate on other tasks and avoid these repetitive tasks.
- **Decision making:** AI technology improves the way decisions are made in the business. for example, if a decision is being made to introduce a new product an online survey can be done giving a visual representation of the consumers specifying the positive and negative and therefore the ultimate decision can be taken without any extra cost. By taking the help of website history businesses can take decisions of where to make changes by having a constant check on the reviews it enables them to work on the flaws much easier.
- **Consumer analyses:** AI is showing constant growth in customer engagement and services with the help of its user-friendly tools. The AI-enabled tools help to analyze the real-time data of its customers and helping businesses to function efficiently.
- **Self-service:** In the era of the internet consumers do not will to function with an agent or support for any problem instead look for answers on the internet, a very important reason why retail, service industries are adopting AI tools. Does artificial Intelligence enable valuable insights into what customers want? Where are they getting stuck using the app or website of your brand? With these insights, companies can prepare a section of FAQs to answer these small queries thereby avoiding the presence of human beings.
- **Visible, written, voice box interaction:** AI-enabled tools like face recognition, voice identification helps consumers to ensure the safety of their accounts and businesses to identify their target customers. This helps them to provide the customers with any offers, discounts to make them feel satisfied with the product or service.

d) Challenges Implementing Artificial Intelligence In Customer Experience

- **Computation capability:** AI requires a huge amount of data power and energy to function properly for its algorithms and programs. AI active usage of the machine and deep learning comes at a high price. Not many start-ups can enable their services with AI and thereby have to opt for physical interaction with their customers.
- **Trust complications:** AI tools create trust issues as the data which is gathered can easily be manipulated or wrongly added leading to wrong output to business. This leads to wrong decisions for companies. When wrong data is gathered right decisions cannot be taken. Many customers do not even know the usage of smart apps, smart tv making companies invest in its usage and

exploring information to its customers first regarding this.

- **Less awareness:** There are many places where marketers can use AI instead of traditional marketing methods. The actual problem that arises is the lack of knowledge of this technology. Many researchers, scholars, generation x are aware of AI but the generation before them does not have any idea of AI tools and technologies. Some many start-ups and businesses sell or market their products online use AI but are still not aware of its many advanced like google cloud, amazon web services, etc
- **Presence of human beings:** No matter how advanced technology is used human presence is a must in any work field. The cost of learning these advanced AI tools is very expensive for the current generation.
- **Data manipulation:** The biggest challenge of AI is data privacy and security. As AI tools gather customer information from around the globe there is fear of losing the entire data by deletion or hacking of data. This affects the business goodwill and reduces the trust of customers in the product. The very famous case can be elaborated on when iCloud faced a backlash from many famous Hollywood celebrities as several personal images and information of celebrities were hacked and released. This reduced trust of customers in iCloud. Another example can be when it was released that WhatsApp is not safe anymore and all the personal chats of its customers are being revealed. This led to a drop of nearly 40% of users not use WhatsApp for this reason. However, WhatsApp later bounced back its customers by advertising on their app relating to data security and privacy.
- **Real data problem:** AI though gives actual user data but creates problems for business as the data is from a common area defining common culture, religion, demography, this leads companies to not identify the challenges faced by the consumers. Sometimes the reviews or FAQs section does not respond clearly to customers leading to losing brand loyalty. Many big companies like Google, Facebook, and Apple have faced backlash for using consumer data thereby lacking their security and privacy, whereas India is keeping a strict regulation on IT flow in the country.

e) How To Overcome The Challenges Of Ai For A Better Customer Experience?

To overcome the many challenges of AI in the field of services for better customer satisfaction these steps must be implemented:

1. **Plot a consumer satisfaction strategy:** the very first step to set up an AI-driven customer experience is to first identify and match them with the objectives of the company. This happens when the marketing team gathers and identifies their type of customers what are the major flaws and then opts for AI.
2. **Strategize and analyze customers' journeys:** from the beginning as the customer purchases use and ask for support regarding the product a consumer is connected in all these aspects. The second step is to reach out to these flaws and develop a strategy to combat them.
3. **Knowledge of AI solutions:** next marketers need to follow that before implementing AI solutions in the business what all is needed to make it happen. The most apparent part is imparting knowledge to your marketing workforce so that it creates better efficiency and productivity of your brand and your website or tool functions in a smooth manner.
4. **Decision making:** the next step is to decide to impart AI in your existing application or link with any AI agencies, the latter one is more preferable as it helps your workforce to adopt quickly and also does not disturb your customers.
5. **Implementation and control:** the final step will be to look into how your AI tool is helping the customer service, is it solving issues? Is it keeping track of consumer queries? For this alone the human presence is a must for which the most important factor here is to develop an AI team in your organization who can directly look into these flaws.

Conclusion

Artificial intelligence is changing the service industry functions and how consumers interact around their products and services. It is giving

a dynamic route to enhance and make better strategies following the changing technology for creating an efficient consumer support system. When consumers interact about the product or service with the sales service team, AI can understand those needs and cater to help the service department to deliver optimum customer satisfaction because it makes use of programs, languages, algorithms which can identify, analyze, interpret long raw data in simplified forms. AI paves way for marketers to focus and function on other tasks which require human intelligence like innovation, research and enable them to solve the routine multi-tasks of the business.

There can no longer be debate those businesses that develop and change their consumer experience following dynamic technology will be the ultimate king of Industrial Revolution 4.0, an era where artificial intelligence will be the ultimate ruler in the service industry. This is now can be seen without a doubt by the growth of e-commerce during the pandemic.

Artificial intelligence statistics for the year 2019 -2020 reports the future of AI in the service industry as follows:

• By 2025 worldwide AI market investment will reach 89 billion.

• In 2021 nearly 15% of consumer interactions were done with help of AI.

• In 2021, 50% of service companies will serve a major investment in chat-bot for efficient customer satisfaction to overcome the pandemic.

• By 2030 approximately 70% of the service industry will implement AI technology in any form into their services to combat the changing current times.

Industry 4.0 requires all service industries to function its various service activities like customer support, creating demand, identifying target consumers by integrating the consumer and products data globally for a better understanding of each which in turn demands the use of AI.

It will be over a decade when almost the entire market adapts to AI for efficient customer satisfaction but we cannot deny that its presence is already felt and AI has come to stay for a long period

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CHALLENGES IN INDUSTRIAL INTERNET OF THINGS (IIoT) FOR DETECTING THE FAULT BASED SYSTEM

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ABSTRACT

Real-time monitoring is the pillar of Industry 4.0's in that numerous systems have been developed to monitor electricity, pressures, temperatures, and other factors in industrial operations. The improvements of micro-electromechanical devices, a wide range of sensors for sensing, processing and wireless communication is used to collect data for environmental and equipment monitoring. The sensors are connected through wireless sensor networks and the volumes of data transmitted to the cloud are excessive. The sensors help to minimize the load and balancing of the network and cloud resources consumption. It accesses the cloud which requires fog installation to determine architecture for connecting sensor and gateways. The result depicts that fog organization is critical for balancing computational load and network resource utilization on the public clouds. The service irregularity detection is a type of predictive maintenance that carried out data from prior equipment to be failure. The utilization of Machine learning algorithms based on binary classification to predict breakdown and to replace it. The review paper presents about fog-based monitoring system with a single feed forward neural network learning method to resolve the issue of fault occur in machineries. In addition, an efficient Cognitive-based Machine Learning methods are used to identify faults in IIoT.

Keywords: *Industrial IIoT4.0, Sensors, Machine-Learning, Cognitive Algorithms.*

Introduction

The Internet of Things (IIoT) is a computer paradigm based on pervasive Internet connectivity, in which everyday things are transformed into linked gadgets. Hundreds of billions of smart things are being deployed, each capable of detecting their surroundings, transmitting and processing obtained data, and then feeding back important data to the environment. The Industrial Internet of Things (IIoT) is a subset of the IIoT includes Machine-to-Machine (M2M) and industrial communication technologies with applications in the automation industry. IIoT provides the way for a deeper knowledge of the manufacturing process, with favourable implications for the production system's efficiency and long-term viability. With a plethora of sensors deployed around the industrial operational environment and equipment in the era of IIoT big data, the full potential of Industry 4.0 may be reaped in production processes, integration of cloud computing technologies and cyber-physical systems. The networked sensors would communicate monitoring data on a continual basis, enabling for preventative maintenance and a decrease in unexpected downtime using data processing techniques.

Large-scale and small-scale factories, as well as small and medium firms, have created sophisticated networks for monitoring and defect detection systems as a result of globalisation and distributed Internet of Things (IIoT) computing frameworks. Different aspects such as hardware–software design communication protocols, effective processing of massive data and effective prediction and detection algorithms are necessary to accomplish successful intelligent activities. The absence of sensing units that can be interfaced with and without legacy devices, as well as the manner of integration with communication systems such RS-485, Modbus, Profibus, RS232, Mcconnect, and Message Queue Telemetry Transmission(MQTT), are the most difficult aspects. Implementation of machine learning techniques, predictive analysis, parallel computing, and detection and prediction accuracy are all connected concerns in software.

The issues can be solved with the introduction of new hybrid clouds and hybrid clusters that use the Internet of Things; nevertheless, their cost and maintenance time are quite high. More

money has to be invested in the industry up keep and service. Furthermore, designing and implementing a hybrid cluster, combining clouds with numerous Machine Learning algorithms, and attaining high performance in a real-time environment are the most difficult tasks to complete. The cloud is especially important for storing the vast volumes of historical data generated by plant sensors, as well as for performing complicated activities. For example, offline data processing, distributed algorithm execution The Edge looks to be crucial in terms of data collecting, processing, and analysis the hardware of the systems in use at this time has numerous limits in terms of memory and computational capability. These devices, on the other hand, can deliver findings in a relatively short amount of time, making them perfect for industrial applications with large data rates. Fog and cloud computing are inextricably linked.

According to the definition, Fog is a cloud computing extension that comprises of many edge nodes that are directly connected to physical devices. Unlike centralised data centres, such nodes are physically closer to devices, allowing them to connect instantly. The enormous processing capability of edge nodes allows them to process enormous volumes of data without having to transfer it to remote servers. Their goal is to assist resource-intensive IIoT programmes that demand minimal latency. The difference between fog computing and cloud computing is that the cloud is a centralised system, whereas fog is a distributed decentralised infrastructure.

Literature Review

Aditya M. Deshpande (2020), have introduced a computer vision toolbox for non-intrusive digitization and also proposed architecture for continuous monitoring of hardware. It enables the integration of new programming application into CV toolkit's architecture. For the information is given in series manner to identify the fault occur in machineries.

Arup Ghosha et. al. (2020), proposed the Manufacturing Process Failure Diagnosis Tool (MPFDT), an automated tool that can effectively diagnose and isolate faults and anomalies in Programmable Logic Controller (PLC) managed manufacturing systems. It state that, to find discrepancies between modelled and observed manufacturing process. It use the Deterministic Finite-State Automata (DFA) for observing state transition behaviour of PLC control process. Another method used in one-class classifiers based on Artificial Neural Network (ANN).

Azin Moradbeikie et. al. (2020), have proposed a risk management strategy for safety and security of Industrial Control System (ICS) applied many critical infrastructure. Hazards occur either system failure or cyber attacks. It use the method as hazard detection and use fuzzy clustering timed automata model is used to reduce reconfiguration time. It use flauid storage system to simulate in the work for producing 97% accurate hazard separation. It contains number of iteration using K-means algorithm for computational complexity.

De Vita.F et. al. (2020), have proposed a hardware/software infrastructure for sensor data in an industrial field. In this the researcher developed an Arancino mignon board for fault prediction based on sensor data fusion to evaluate the working conditions of machineries. While compared to this Deep Neural Network (DNN) topology and Support Vector Machine (SVM) classifier, it increase the performance, accuracy, recall loss and space. It is efficient in hardware infrastructure and also use the Self-Supervised Selective Self-Training (S4T) framework allows data collection, training machine learning model and deployment of AI applications.

Ghosh (2020), have experimented with a Manufacturing Process Failure Diagnosis Tool (MPFDT).In this, the researcher use Deterministic Finite–state Automata (DFA) model to determine the Programmable Logic Controllers (PLC) control measures improvement. It consists of one-class classifiers based on Artificial Neural Network (ANN) used to determine difference between observed and reference value of assembly system. The result shows that FADI precision speed is highly increased to 98%.

Hamad Naeem et. al. (2020), has proposed architecture for detecting malicious activities in the IIoT. It implements the large network for sending and receiving data by connecting smart devices. This paper use image visualization

deep learning malware analysis method for identifying malware attacks in IIoT. Due to their computing complexity and limited resources cannot be used directly in IIoT device. This model incorporates malware detection into Deep Convolutional Neural Network (DCNN) model. The result stated for predictive time and accuracy detection are increased constantly.

Moradbeikie.A (2020), have suggested a new strategy for separating known threats in ICS. The researcher used a peril identification technique for accurately finding the fault into four categories as, Transient disappointments, lasting disappointments, irregular attack and covert assault. The researcher designed a sensor to increase the resistance to attacks and also reducing the reconfiguration time. This result obtained the reduce amount of time to reconfigure a structure. It shows a error rate high.

Mustafa Cakira et. al. (2020), have experimented an application of popular machine learning algorithms on predictive maintenance based on condition monitoring system. It provides real-time monitoring and recording of data. By utilizing condition monitoring and predictive maintanenance to produce accurate result. It work as in the form of delivering alert messages to mobile phones for detecting any fault occur in IIoT environment.

Won Hwa Choia et. al. (2020), has proposed the development of fast diagnosis model based on predicting energy consumption. To detect the abnormalities of dataset while sending and receiving information. It use Random forest algorithm for diagnosing abnormal condition. Time series forecasting method is used to overcome fault dataset. Outlier detection use Inter Quartile Range(IQR)method and consider data out of the defined range to be outliers and also have overlapping sampling technology for reconstruct the data structure that can be supervised learning in dependent and independent variables.

Yanxin Wang et. al. (2020), have proposed a Lightweight Convolutional Neural Network (LCNN) system for intelligent bearing fault diagnosis, this algorithm largely satisfy the need for less parameter amount and storage space for maintaining high accuracy. It is used for depthwise separable convolutional method and hierarchical search method is implemented automatically to explore the optimal LCNN for bearing fault diagnosis .In this model, computational and storage cost are reduced and also allowing extended mechanical system to optimize the training and testing time of the model to improve accuracy.

Apostolos Xenakis (2019), has proposed an IIoT and cloud-based real-time machine observing system with fault prediction. In this, the researcher stated as cloud performance for predicting result. It get the data flow between the fog and cloud layers. The researcher stated a cross layer streamlining problem relating to modern sound status testing and resolve in distributed manner using non-concurrent technique for multiplier calculation.

Di Modica et. al. (2019), have proposed a fault management system based on a cloud service deals with fog and cloud concept used in IIoT environment. To identify the fault devices in the things of layer. While, it can be used in several applications such as smart city, smart health, smart water, smart industry etc., the fog platform achieve a fault tolerance in the middleware services and helps to create a stable environment for IIoT-based environment.

Huakun Huang et. al. (2019), have proposed the fault detection in IIoT is not accurate for stringent fault detection. To introduce the method as Gaussian Bernoulli Restricted Boltzmann Machine (GBRBM) based Deep Neural Network (DNN).This method transform fault detection into classification problem and to achieve predictive and adaptive response to its environment. This model is applicable for large industry. To improve accuracy of result, researchers use multi-block GBRBM model.

Satish T.S. Bukkapatnam et. al. (2019) have presented manufacturing system-wide Balanced Random Survival Forest (MBRSF), a novel nonparametric learning approach that combines the intrinsic dynamic coupling. In this, the researcher use MBSRF, predict the machine breakdown in real world environment and also to improve efficiency. Furthermore, the researcher use AI methods for fault data identification with other IIoT sensor signals to create a realistic approach of imminent manufacturing device failures. It works directly

derive the probabilistic estimate of time to failure. The nature of this method using Markovian nature of underlying restoration process.

Yan Song et. al. (2019) has proposed a domain adaption network (DAN) and a retraining strategy is proposed to distinguish system faults of different domains. This method is based on weighted pseudo-labelled testing dataset. To identify the two networks cumulative failure is used to train the entire network and also to combine labelled source data with weighted and pseudo-labelled research dataset to train the data. Furthermore, to increase the reliability and performance of the result.

Apostolos Xenakisa (2018), have proposed automatic scalable, energy efficient monitoring are designed as a decentralized system for real-time Machine Condition monitoring (MCM)for fault prediction on IOT and cloud. It uses the fog and cloud concept. In this we use cloud node, the data acquisition phase is completed by sensor. The health status monitoring and solve in distributed manner using the asynchronous altering path method of multipliers (ADMM) algorithm.

Chen Kana (2018), have experimented a novel method for large-scale IIoT system data preparation, network visualisation, condition monitoring, and issue resolution. The work started with dynamic wrapping algorithm for computing difference between machine marks followed by stochastic computation for industries. The result shows the accurate and efficient marking of both cycle-cycle and machine to machine.

Gia.T.N et. al. (2018), have proposed a novel and smart Fog-based device for continuous, signal monitoring in real-time of smart hospitals for identifying fault in machineries. It support the fog and cloud for retrieving information of patients and their diseases. It use sensor based fault identification and the result shows the accuracy and increase error rate and performance also. Sensor nodes, smart gateways with fog computing enhancing the variety of signals ranging from bio-signals.

Quan Xu (2018), have experimented with cloud-based mineral processing enterprises. It use fault diagnosing algorithm to identify the fault which occur in monitoring system that are connected to the things of layer. It works in two ways as, condition monitoring system provide a set of data acquisition, transmission, analysis and processing for speed up the process then, IIoT cloud and big data are used to collect data and expand the fault diagnosis algorithm.

Wang et. al. (2018), have proposed a framework for a fog computing-based healthcare IIoT system for Directed diffusion and limited flooding to improve the reliability of data transmission. It use Reduced Variable Neighborhood Search (RVNS) queue process to filter the data and is used accessed quickly in this method for speed processing. To identify the fault in this mechanism and it is successfully delivered to resource allocation. The efficiency of RVNS and First in First out (FIFO) queues are compared in fog computing.

Federico Civerchiaa (2017), have experimented with a high-level IIoT monitoring system. It is designed for predictive support application assessed through test-bed based on real IIoT sensor gadgets installed in power plant. The architecture integrates each hub to be reached from anywhere through IPv6 address. Furthermore, detecting each device considered as authentic IIoT. It is capable of removing extra data from acquired values for detecting IIoT device.

Saa D et. al. (2010), has proposed the paper about the cyber-attacks .The researcher use six stage for providing top to bottom method. It use novel fuzzy position measurement for computing purposes. They compute based on type -1 and type-2. In type-1, the researcher used for flaw detection and implement fuzzy logic regulator in the hotbox gadgets on the end stage. In type-2 fuzzy architecture is used for cloud-based programming applications.

Pros & Cons

- LCNN convolutional method for single fault identification.
- Few researcher, compared the model with previous Machine Learning algorithm and obtain accurate result with high efficiency.
- The researcher also used various methods to identify the dataset in which the fault in given input, and to observe, sending notification to the admin about the fault.

- By, reviewing numerous research papers, the researcher observed that the usage of Machine Learning algorithm is complex and efficiencies are low.
- Use fog and cloud method, base level connected with the things of layer. Incase of any fault identification in things of layer, it will rectify only in cloud layer which takes high time consumption.

Scope of The Research

- The researcher understand the concepts and ideas and to redefine the IIot 4.0 for detecting fault using dataset of fog and cloud methods.
- To rectify the error in fog layer, saves the time consumption and network traffic to avoid congestion in the cloud layer.
- The fault identification can made up with a notification send to the administrator by using modern approaches in neural network techniques.

Conclusion

The Internet of Things (IIoT) allows exploiting the data that machines have been delivering in modern settings for a long time. The IIoT is intelligent machines are not only better than humans and systematically dissecting information, but they are also better at conveying significant data that can be used to make business more efficient and precise. Monitoring has become a major challenge in IIoT due to the proliferation of integrated sensors. The enormous processing capability of edge nodes allows them to process enormous volumes of data without having to transfer it to remote servers. The networked sensors would communicate monitoring data on a continual basis, enabling for preventative maintenance and a decrease in unexpected downtime using data processing techniques.

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INTEGRATION OF MARKETING INFORMATION SYSTEM AND HORTICULTURAL PRODUCTS IN TRIBAL PLACES; IN CASE OF SRIKAKULAM, A.P.

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ABSTRACT

India's tribal economy is heavily dependent on agriculture and the Government of India has given due emphasis on agro-processing, value addition, promotion of agricultural and ago-based exports. The poor performance of the tribal agricultural commodity marketing system strongly influences the profitability of Tribal society. To be specific on horticulture produce along with forest produce, the elements that influence the performance are weak coordination of input, output, and credit markets. Srikakulam tribal region's performance of horticultural marketing system is constrained by many factors like agricultural produce quality, market facilities, linkage of research and extension, market information and intelligent service, intermediaries, vertical and horizontal coordination, and integration to the marketing system. The study aimed to increase commercialization of the tribal agricultural production system through integration of MIS. The methods proposed are descriptive and exploratory design and mixed approach. The Data collected from farmers, Intermediators and households though stratified sampling has been analysed through ANOVA and Multiple Regression Analysis. Certain recommendations have been offered to activate profitability of horticulture produce from the analysis and findings.

Keywords: *Agricultural Produces, Market Development, Value Addition, MIS*

Background of the Study

It is evident through the recent studies and certain practical observations that the condition of tribal farmers that produce horticulture produce is highly vulnerable since the profitability is decreased because of a number of constraints which are taken as advantage by the Intermediators (Asati B. S. and Yadav D. S. 2004).Several studies explored that the maximum challenges are associated with information accessing which is far way away for tribal farmers so as they know little about the lucrative markets to promote their produce (Rao, P.T. 2014).

It is found that there has been a big gap between the farmers and industry at the standpoint of market knowledge, Technology usage and Information access. Several studies have been confined with rural produce, but the tribal areas with high populated regions India face a lot of problems in marketing the produce andeven the government is taking pains to market certain produces such as custard apple, Pineapple bitter guard and seasonal vegetable etc. Though the importance of organic produce is increasing exponentially in Indian market, the profitability gained by the real and ground level producers is found very less (DAC&FW, 2016).

The traditional methods of marketing adopted by tribal farmers are called as the passing clouds since the emerging digitalised methods dominate the total marketing system in many ways and paves the way to additional profitability. So, it is found important that the unserved traditional plans for a long time should be replaced by technology associated plans. Hence there is a need to assess how the integration of Marketing Information System directly with tribal farmers will be applicable. Under regular transactions, there has been a lot of income lost by the tribal society which is not studied so far. Moreover, the relevancy of the study in the tribal places of Srikakulamdistrict (Singh M.K.1982).

In the study area, hectares of tribal land are readied for irrigation cultivation by the farmers. However, the cultivation and marketing systems are so ill developed that the farmers have not benefited from their efforts as expected. These days, most farmers in the tribal areas of Srikakulam, can produce good amount of horticultural products mainly through irrigation but find that the local traders and brokers are only prepared to pay low prices for their goods compared with the final price consumer pay for their products(Venugopal K. et al. 2013).As individual farmers, they have

little bargaining power with traders and must often accept almost any price offered.

The study offers the extent possibility of production and marketing individually by the models of Integrating Marketing Information System with Tribal farmers and Horizontal and Vertical Integration among farmers and industry.Farmers are expected to participate in the study as respondents and expose the variables for the ethical and professional practices obtained by the researchers

Objectives

The core object is to study the problems and prospects of horticulture industry in tribal places of north costal Andhra Pradesh.

The specific objects of the study are:

1. To identify the problem and prospects related to Marketing Information System applications to Horticulture produce in tribal areas of Srikakulam District.
2. To assess the impact of demand and supply factors, Information factors, backward and forward integration factors, Infrastructure factors and middlemen factors on the profitability of tribal horticultural products
3. To offer the strategic tools to commercialise the tribal horticulture produce

Literature Review

The positive effect of Marketing Information System implementation with the operations of nurturing internal records, Marketing Intelligence, Marketing Research and Decision Support System on productivity and accessibility of marketing horticultural products and its integration possibilities of MIS producers (Ranganadh N.S. &Koppala Venugopal, 2020).

Contextual and contingency level of Problems and prospects of backward and forward integration of industry and horticulture producers and integrating techniques which will minimise the mediation and increase the profitability and demand (VenuGopal K &Vijay Kumar .L., 2013).

The real consequences of fluctuating prices, traditional and modern consumer preferences, seasonality associated with climate, socio-cultural influences and demographics at the standpoint of demand and supply status of tribal horticultural products will be explored which will in turn be beneficial to increase the profitability by reorganising certain significant variables (K.Venugopal&Swathi. K, 2014).

Evaluating the factual status of logistics, storage and horticulture processing units and its operational efficiency with the involvement of private players and the government where the effective use to fulfil the needs of the producers will be revealed. The performance will be thereby increased and the optimum utilisation of the resources would pave the way to profitability(Rao P T, 2014)

The analysis of many factors like agricultural produce quality, market facilities, extension services, linkage of research and extension, market information and intelligent service, access to credit, government interventions, intermediaries, vertical and horizontal coordination, and integration to the marketing system would give the realistic pioneering ideology which will become the inputs to create additional profitability (D. Pulla Rao, 2011)

The horticulture sectors account for about 13 per cent of gross cropped area (192.8 million hectares) in India. Its share is about 37 per cent of the total exports of agricultural commodities. (DAC&FW 2016). Andhra Pradesh is the second largest producer of horticulture crops. A.P's horticulture crops accounts for the crop of 17.48 lakhs hectors with the production of 301.73lach MT's. (Appalanaidu P., 2019).

Majorly, the horticulture commodities cultivated in the tribal region are currently marketed in Tribal region by using isolated and informal channels where most are dominated by brokers. There is a huge demand for these agricultural commodities in A.P. in general, and in this Northern coastal region in particular (Venugopal K., et.al, 2013).

Many problems attribute to the current poor market operations in the region in general and the two places in particular. Marketing information as a key of any marketing system since most of the problems are due to information asymmetric and absence of where the farmers are always disadvantageous (Singh, M K, 1982). And in the information asymmetric situation, the one with the

information are mostly brokers and traders who deliberately withhold the information to force producers to accept any price offered to them.

Marketing tribal horticulture producers face innumerable problems with respect to the marketing associated elements such as information of demand and supply, competition and economy, Infrastructure optimisation, integration with technology and industry which should be restructured for the increased profitability (Srinivasarao Ch., 2010).

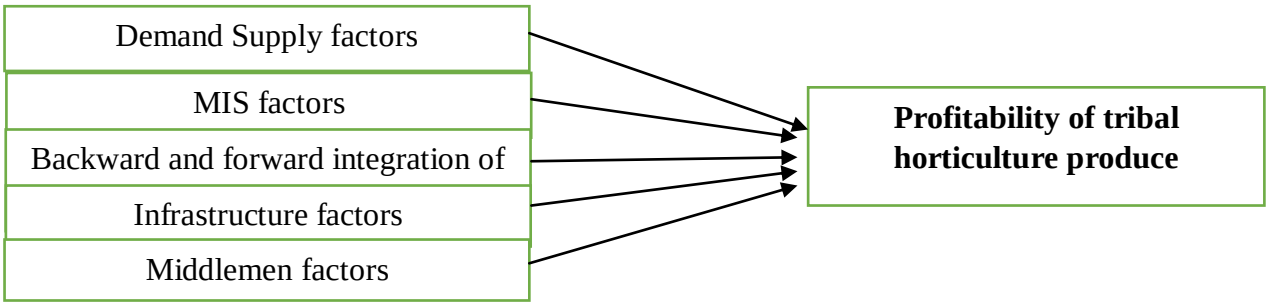

Fig. 1: Conceptual framework

Methodology

Descriptive statistics was used so as to analyse the dimensions of market analysis and exploratory study was also conducted to evaluate the legal and policy based practices**.** Data was gathered from both primary through questionnaire, interview and observation and secondary sources include website, reference books, journals, periodicals, ministry of agriculture and horticulture association.

This study targeted the horticulture produces farmers, Mediators and other key stakeholders of horticulture produces. To determine the sample size, convenience sampling method was used and the sample was determined as 115 as per the formula of Yamane (1967) **(**$n=N/1+Ne^2$)

The validity of the questionnaire was measured by *Content Validity Ratio*, given by Lawshe in 1975. The questionnaire has sent to 20 HR subject experts: 12 questionnaires to experts in Andhra Pradesh state, six questionnaires to experts in different states; other than Andhra Pradesh and two questionnaires to experts in outside of India (abroad). The values of their opinions: *Essential, Useful but not essential* and *Not Necessary* were noted down. All the observed values (in between 0.6 to 0.8) are found to be more than the minimum value required (0.42).

Reliability of the questionnaire to farmers was calculated by Cronbach's alpha method, after conducting pilot study to respondents. The reliability value shown in the following table. The number of items in the questionnaire were 85 and the Cronbach's alpha was 0.71. The found value was 0.71 which was greater than 0.65 (which was generally consider for acceptance of the questionnaire) so the questionnaire was accepted for the usage in the future research.

Reliability Statistics

Cronbach's Alpha	N of Items
0.71	85

The data was gathered through questionnaire and interview with farmers and related communities. Both the managers of the functional horticulture farms of the sample industries and officials of ITDA were the participants in the interviews. The reason to use interview preferably will be that more of the data needed is qualitative in nature and difficult to collect through other means, especially through questionnaire.

Both quantitative and qualitative method of data analysis was employed. After the data had been collected, the responses was analysed qualitatively and quantitatively with ANOVA and Multiple Regression Analysis by using SPSS 24.

Analysis and Interpretation

As it has been determined in the objectives to know the weightages of each factor influencing the profitability of tribal horticulture produce, the Multiple Regression Analysis has been carried out as follows.

MIS Integration factors as Independent factors are Demand Supply factors, Information factors, Backward and forward integration of Industry factors, Infrastructure Factors and Middlemen Factors and Profitability of tribal horticulture produceisthe dependant factor

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.243[a]	.059	.015	1.176

Table 5.1: Model Summary

a. Predictors: (Constant), Demand Supply factors, MIS factors, Backward and forward integration of Industry factors, Infrastructure Factors, Middlemen Factors

R Square value is 0.059 as shown in table 5.1, which means that all the levels of items in the variable MIS Integrationcontributing 5.9 per cent in Profitability of tribal horticulture produce. The remaining 94.1 is being contributed by other unknown variables.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	22.312	4	5.578	5.223	.001[b]
	Residual	118.550	111	1.068		
	Total	140.862	115			

Table 2: **ANOVA**[a]

a. Dependent Variable: Profitability of tribal horticulture produce.

b. Predictors: (Constant), Demand Supply factors, MIS factors, Backward and forward integration of Industry factors, Infrastructure Factors, Middlemen Factors

In table 2, the significant value between the Profitability of tribal horticulture produceand the predictors is 0 .001 which is less than tested alpha value (0.05)which shows that there is significance between dependant variable and its predictors. On the other hand, we can also conclude if there is one level in items' increase, there will be 118.550increase in the MIS Integration factors.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.435	.654		3.725	.000
1. Demand Supply factors	.341	.151	.284	2.260	.026
2. Information factors	.347	.097	.385	3.593	.000
3. Backward and forward integration of Industry factors	-.190	.111	-.197	-1.711	.090
4. Infrastructure Factors	.262	.187	.173	1.399	.165
5. Middlemen Factors	.313	.145	.355	2.160	.033

Table 3: **Coefficients**[a]

a. Dependent Variable: Profitability of tribal horticulture produce

According to table3, the first item in MIS Integration factors is demand and supply which is significant relating with the Profitability of tribal horticulture produce as the p value (.026) is less than the significant value (0.05); The second item i.e. Information factors also showssignificant result to the Profitability of tribal horticulture produce where the p (.000) < significant value. Backward and forward integration of Industry factors, the third item is not showing significant result to the Profitability of tribal horticulture producewhere the p (.090) > significant value. When it comes to fourth

item, Infrastructure factors is found insignificant relating to Profitability of tribal horticulture produce where p (.165) is more than significant value. Lastly the Middlemen factors is found significant relating to Profitability of tribal horticulture produce where the p (.033) is less than significant value.

Hence it can be understood that the factors of Demand & Supply, Information and Middlemen show high significance on the profitability which is at par with many research studies. It is surprising enough to be quite contrary to common-sense applications, Backward & forward integration of Industry as well as Infrastructure factors show insignificant. So, the respondents felt that the transitions happen in the industry do not have any impact on the trade of horticulture at tribal places. On the other hand, major challenge for most of the farmers is the transportation which is being exploited by middlemen has not shown any significance would absolutely give adverse ideologies.

Recommendations

1. Basic information from the market is to be gained by the tribal farmers with respect to market changes every now and then as well as the changes which should be tailored by the farmers. They will have to be participated in certain decision making venues at the standpoint of time, season, crop, transportation and trends.
2. The source of information which is highly important to tribal community because, they have a dogmatic behaviour of rejecting unhabituated media sources which should be found as an imperative element. The government or related associations should facilitate the technology and train them to access, understand, and respond.
3. Information related to market, competitor, prices, transactions, customer and middlemen have been ambiguous instead of transparent. This would generally confuse the farmers and create fear among them and thereby leads to be more dependent on middlemen.
4. Backward integration may not be a big problem for most of the tribal farmers depend on the nature and naturally available resources. They are experienced and expertise to procure the seeds and other raw material. They use cattle for the accomplishment of their farming. But they are unaware of the forward integration i.e. about how long the produce is to be travelled to reach the customer and the interpolations happen in the middle road. This should be educated to them for the profitability being missed by this community lies in making the most of forward integration.
5. Though there is a slight development in providing infrastructure facilities at tribal places such as storage facility, transportation and technology, it is even manipulated by middlemen and not practiced for the real benefit of tribal farmers. The best utilisation of infrastructure may happen when the infrastructure related to farming, processing, transporting and marketing is exclusively owned by the farmers under a genuine supervision.
6. The dominance of the middlemen is to be reduced for the margin they get is much more than the producers which is ethically wrong. Government should make the arrangement of all informative tools to reduce the dependency on middlemen.

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AWARENESS OF DIGITAL TECHNOLOGY AMONG RURAL WOMEN ENTREPRENEURS

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ABSTRACT

Women to develop knowledge and skills are required from realizing their major barriers stopping them from an entrepreneurial carrier to successful entrepreneurship. At present, entrepreneurs have developed knowledge and skills, important characteristics of entrepreneur, motivational factors and leadership styles for success in the entrepreneurial carrier. Women's entrepreneurial activities contribute to socio-economic growth for utilizing all resources is essential for sustainable development and requires digital skills along with the drive for innovation. Digital technology uses any type of learning the need of today's world is the result of innovations and technological advances. Indian Government aims to achieve digital technology to empower society in a better way. Digital skills aim would be very difficult to achieve unless there is awareness amongst the rural people. This research paper seeks to analyze the awareness among rural women entrepreneurs about Digital technology in India. This paper contributes to an understanding of the awareness of digital technology among rural women entrepreneurs and the implications for society as a whole. The digital technology opportunity for female entrepreneurs helps to overcoming the constraints they creating a more favourable network system.

Key Words: *Awareness of Digital Technology and Digital Skill, Rural Women Entrepreneurs, Opportunities for women entrepreneurship.*

Introduction

Digitalization

Digitalization means the use of digital technology to replace a business model and come up with new opportunities for the operation of working a digital business.

Awareness Digital Technology

Awareness of digital technology means accessing the internet savvy understanding the growth in use for social and business purposes. Digital skills are using the benefit of online trading and social media marketing, online identity, protecting your online privacy, computer security, social networking, monitoring, and promoting your business.

Digital Skill

Digital skills define as a collection of potential to use digital devices, intelligence, networks to right of entry and instruction. They facilitate groups to generate, communicate, work together, and solve problems for successful and creative self-fulfilment in learning. Digital skills are necessary to make fundamental use of digital devices and online applications skills. Digital skills create people who are using digital devices, understanding outputs, and developing programs and applications. Digital Skills require understanding and also data handling, communication skills involve the modification of existing businesses through high-tech and the creation of new creative ventures indicate by the use of technology to improve business operations, the invention of new business models. Many business initiatives foster business women's activity related to the creation, development, and expansion of business and present a capacity for the development of business in rustic areas.

Digital Technology

Digital technologies provide various opportunities for the creation of new ventures that are required to have the digital infrastructure, digital business, and financial marketplace for women. Women entrepreneurs have changed the potential for the digitalization of the economic status. The people are expected to change the merchant circumstances, providing a dramatic role to the fountainhead of business based on information-based platforms and offering a rising market moment for upcoming businesswomen. The determination of this paper is to peruse the perception of digital technology among rural women entrepreneurs, as the technology has changed the way people a business's function, peoples thinking, behaving, communicating, and working at different workplaces. Digital

technology has changed in the world particularly for women who are facing obstacles in approach, using, and holding telecommunication. While new technical knowledge offers great development to increase productive connection-from mobile computer and telecommunication which facilitate trade and access to local and global markets, to growth in hi-tech industries which facilitate and create skilled jobs.

Review of literature

Ananya Goswami, Sraboni Dutta (2015) "ICT in Women Entrepreneurial Firms" the study explore the development of their enterprise is still unable to completely tap the potentialities of ICT for businesswomen. A key factor for both national and international development of the ICT sector is now a growing sector for employment. The developing countries in the digital divide are still much prevalent in the gender gap. In terms of the ICT training business, women are being faced with lots of challenges, financing, social norms, and linguistic issues. Government to promote and develop the usage of ICT among women entrepreneurs both in rural and urban areas should come up with special policies and schemes on financial support, infrastructural support, and training facilities to make them self-independent and self-confident.

Kothapalle Inthiyaz, B.Jayamma (2017) "Impact of ICT on Women Entrepreneurs" ICT tools are helping women entrepreneurs with unique and vast opportunities to empower themselves in a multifarious way. This paper analyzed the empowerment of women and the impact of information and communication technology and has been implemented by businesswomen to overcome business threats and there are also business opportunities in the sector itself. The pandemic of covid-19 the survival of many business organizations in the competitive world is depending on the effective and efficient use of the ICT sector.

Dr.Deependra Sharma, Amrita Grewal (2017) "Building Digital Women Entrepreneurs: A Study on Women Entrepreneurs' Use of Social Media to Help Sustain Their Businesses" The study explores business women find digital technological platforms as an effective business tool to help them sustained their businesses. Telecommunication created a new generation of women entrepreneurs allowing their businesses, giving everyone an equal opportunity to succeed and to be promoted at a very low cost. . The study's findings have important implications for policymakers and for promoting the growth of female entrepreneurial ventures. It also provides insights to women entrepreneurs who wish to start their own ventures and for other industry which has the greatest impact of social media on their businesses.

Omar (2017) analyzed that the relationship between the factors of digital inclusion, support system towards the empowerment of women online entrepreneurs. The result exposed that 76 % of the participants used WhatsApp as the main Internet application in running their business. Communicating with their customers, suppliers online and strengthen their relationship socially or personally. The business being performed has developed well through interaction and communication on the network.

Podile (2018) highlighted the proposals of digital India for the socioeconomic liberation of women entrepreneurship. He found out that the digital India program assures transforming India into a society empowering digitalization by targeting digital literacy, resources, collaborative platforms, and different initiatives for the same.

Dr.N.Ravichandran (2018) "Influence of Technology in women Entrepreneurship" Women owned businesses tend to be smaller and to grow slowly than those owned by men and the distribution of female employment across sectors and the participation of women in managerial positions are also correlated to the level of female entrepreneurship. Women entrepreneurship has a tremendous potential in empowering women. If women are unable to access various technologies due to cultural considerations or patriarchal standards, then growth in income will not lead to take up rates that one would expect based on income growth predictions. ICTs including e-mail, websites, mobile phones and TV should be used to promote export opportunities to women-owned enterprises, such as actively seeking participation in government sponsored trade

missions and fairs. According to 2016 figures, 14 percent of Indian businesses are run by women entrepreneurs, with the figure turning out to be over eight million. The highest numbers of women entrepreneurs are from the state of Tamil Nadu. Technology is playing a vital role to support the women entrepreneurs for pricing, service support, feedbacks from customers and finance related issues. Social media plays the significant role in creating opportunities. Social media plays an effective role to find the solution instantly for the problem pertaining to their products and services through globally. The growth of female owned businesses is growing along with increase in their standard of living, motivation, attitude and self-confidence, and ensures independence. Needless to say, that Technology is influencing in all fields and becomes inseparable in today's life.

H.Akhila Pai (2018) "Digital Start-ups and Women Entrepreneurship" In this fast-moving economy, there has always been a choice for women to have a successful career with independence or stay back due to society's pull. It is has become an old belief that women become entrepreneurs because of push factors like poverty and the need for additional income, etc, Women move to business because of innovative thinking, ability, risk-taker, and passion for achievement. Women in business to change their environment, start investing in women's leadership, contribution to economic development is also being recognized and increase at a considerable rate. The government initiated by start-up schemes is promoting the culture of entrepreneurship by educating women about their hidden potentials and strengths through entrepreneurial orientation programs, spreading awareness and consciousness amongst women to upstage in the field of entrepreneurship by their creative and innovative ideas, making them realize their prominent position in the society and how they can contribute to the economic development of the country.

Neetu Jalan, Vijayendra Gupta (2019) "Enabling Technology for Women Entrepreneurship" The present research attempts to find out the uses and advantages of technology that increases expansion and promotes enterprises, and makes women entrepreneurs successful. This study concluded that digitalization has a very important role in the development of women entrepreneurs in Bhilwara. The use of advancement in e-commerce allows women to explore different sectors of entrepreneurship and work in the field they are interested in. It supports more flexibility and fewer investments for certain task likes marketing, advertising and expanding their business. Digitalization advantages will create a better platform for women entrepreneurs leading to major growth of the economy in India.

Dr. Jyoti Chandwani, DR. Sushma Verma (2020) "Role of Digital Technologies for Women Entrepreneurship in India" Women entrepreneurship and digital technologies go hand in hand for the growth and development of the enterprise. Government and businesses can help women entrepreneurs with the opportunity and relevant guidance on digital technologies. Digital presence permits women to overcome some of the explicit limitations that are enforced on them. It reduces the standing of both time and space restrictions where women lack time due to double accountability to acquire revenue and satisfy family responsibilities. This can form the basis of agreements that limit their mobility in the public domain. Digital technologies have also been a dominant force for the development of women-owned enterprises. It provides and nurtures communication that enhances the exchange of relevant information for marketing, purchasing, creativity, and communication, to name a few. The findings of this research could be used for future practitioners and researchers whose aim is to study women entrepreneurs in general and the role of digital technologies in their enterprise.

Liliya Satalkina, Gerald Steiner (2020) "Digital Entrepreneurship and its Role in Innovation Systems" The overarching goal of this research was to understand how current digital tendencies transform entrepreneurial and business frameworks and how these transformations are implemented in the innovation system. Digital entrepreneurship as part of the innovation system to gain more knowledge about technology implemented the business enterprises.

A.Padma Yasoda Kumari, Dr. Udaya Shankar (2020) "A study of Rural Women Empowerment through ICTs in West Godavari District of Andhra Pradesh" Rural women are integral to the information and communication technology sector in rural areas since they can play a significant role in carrying on the ventures and managing the resources. In turn, their participation is very crucial in the development of the rural and the promotion of the ICT sector in terms of their indigenous knowledge and skills relating to providing efficient services. The concept of rural women empowerment in the ICT sector focussing the needs and their opportunities in ICT's, barriers, and difficulties experienced by rural women and suggest measures for rural women empowerment from ICT's. The rural women entrepreneurs in the ICT sector are able to enhance their capabilities because of their better financial position. They have managed to increase the opportunity of self-employment, economic independence, personal and social capabilities among rural women. The rural women's self-employment activities not only can improve their own lives and family but also contribute to the development of that rural area. The quality of life of rural women has been improved along with regional development.

Research Objectives

The intention of this study to identify the key components of digital competence in terms of understanding ability and perspective for the business women in the rustic areas to be exponential competent with a view to present some suggestion to assist in help the threat and happening.

- To explore and describe how the growth of technology has increased the reliability of business processes.
- To determine how women entrepreneurs are effectively utilizing digital tools to enhance their ventures.
- To identify the main threats and development that businessperson features in adopting the technical knowledge in rustic businesswomen in India.
- To identify any capability or trouble for businesswomen to control in the territorial in terms of the approach and apply of technological affecting?

Digital Technology Opportunities for rural women entrepreneurs

Digital technologies have demonstrated their potential as a catalyst for the political, economic, and societal empowerment of women, the promotion of gender equality, women's participation in public decision-making, and providing access to information and financing, everywhere, heard. The potential of women is steadily diminished in the digital universe, particularly in rustic settings where access, lack of skills, cost, and other socio-cultural factors limit girls' and women's ability to engage with new technologies. Internet has made its way into the urban societies and now is weeping increasingly into the rural areas as well. The accessibility of mobile phones in rural India has opened up new opportunities. Rural women are not detached from this transcendental technology and are using it to their benefit.

The first step towards entrepreneurship, innovation, and change is access to the right information and knowledge. Digital technology can make a greater impact in the lives of women who run different kinds of business in rural areas to overcome many hurdles with timely access to the right and relevant information, market, mentoring, capital and customers. Digitalization and skills that can empower rustic businesswomen could be leveraged wisely to bring closer in their entrepreneurial ventures in different industries.

1.**Access to Information:** Women Entrepreneurs in Rural areas with basic training in using smart phones can learn how to capitalize on their homemade goods, livestock, and sources of business. Smart phones and the internet also provide them with the necessary platforms to educate themselves on being micro-entrepreneurs with ways to set up a business to the knowledge of market prices and other information at their fingertips.

2.**Access to Capital:** Government Initiative schemes for women entrepreneurs like Pradhan Mantri MUDRA Yojana (PMMY), StandUp India Scheme, Mahila Udyam Nidhi Scheme, Bharatiya Mahila Bank Business Loan, Stree Shakti Package for Women Entrepreneurs are

helping to achieve their dreams. Women in rural can directly update themselves with information about such schemes through their smartphones without middlemen. Women entrepreneurs apply for suitable schemes for their business ventures.

3.**Customer Service and Engagement:** Women entrepreneurs in rural areas can now connect with local customers as well as the ones in cities with the help of smartphones; they can take orders through different money transfer applications that can help them with the transactions. Women entrepreneurs' access in business orders (Individual or bulk) can be sent to distant places through services like Express Parcel by India Post. Women entrepreneurs can be networking with consumers on a personal basis can help them grow their businesses.

4.**Business in a networked world:** Internet access and Google search has trained that digitally-equipped women can change their own lives and their communities. Digital skills can help them with bank transactions through bank apps without wasting their time in long queues.

The Importance of Digital Skills among Rural Women Entrepreneurs

Digital skills would need entrepreneurs through technologies to empower and help them transform their skills into successful businesses. Rural women can empower themselves with digital technology and skills, even if they do not know how to read and write beyond basic literacy. Government has undertaken to help empower these rural women entrepreneurs digitally.

The challenges ahead are significant, and we suggest policymakers adopt new approaches to stimulate women entrepreneurship that endorse a thorough consideration of digital aspects. Policy initiatives require the social, economic, and cultural in which women's entrepreneurship intersects with digital engagement. Advanced information and communication technologies provide unexpected and egalitarian opportunities for women entrepreneurs.

Digitalization can play a major role in circumstances sustained rural and societal development. Telecommunications have a remarkable contribution towards the improvement of economic and social development in India and have a positive impact on rustic society. In developing countries like India, to create information-wealthy society, to empower weak people, to reduce the digital divide, sustained development of rustic community declare of telecommunication in the lower-class level of villages is necessary.

The impact of policies to support women entrepreneurs, greater attention needs to be digital technology is enacted in different political, economic, and cultural contexts. To develop new methods to capture, predict, and enables capacity building by the digitalization of empowerment of women entrepreneurs. Women have been affected by these intensive technological developments and technology utilization. The Digital Technologies opportunities could be valuable in overcoming some of the constraints women tackle in their entrepreneurship process. This paper contributes to this direction, identifying new trends and future research.

1. Socio-economic and demographic outline

- 61% are below poverty line.
- 39% are above poverty line.

2. Economic Background

- 77% are owners of the business.
- 91% of women own and manage their business

3. Digital skills and usages

- 95% use mobile including both Smartphone and basic feature phones.
- 75% use Smartphone.
- 56% in the age group of 18-28 years use the Smartphone
- 30% in the age group of 29-39 years use the Smartphone,
- 14% in the age group of 40-50 years and
- Less than 1% is in the age group of 51 years and above.
- 88% use the internet. WhatsApp is the most used social media followed by Face book, Instagram ranks third and Twitter ranks last.
- 53% access social media for networking. WhatsApp is the most used social media platform for marketing followed by Face

book, Instagram ranks third and Twitter ranks last.

4. Digital Literacy

- 24% are unaware of digital financial transactions like PayTM, BHIM, and Google pay.
- 43% are Smartphone users who are unaware of digital financial transactions.
- 52% currently are listed as sellers on e-commerce websites
- 71% have received training in selling their products
- 94% who believe they can have a wider market by selling their products online would like to receive training in online commerce.
- 66% use online banking.
- 58% use mobile banking.
- 74% said their sale was increased because of photography of products.
- 81% said that their sale will increase because of adding voice with the product
- 80% using e-commerce said that their sales were increased because of e-commerce.
- 96% believed that digital skill training was important in the post lockdown period.

5. Access to Information

- 59% have not availed any government scheme related to them.

Overall the survey highlights that there is a need to provide digital skills to rural women entrepreneurs, especially in areas of financial digital literacy and online banking. This study identified the empowerment of women through digital technology and skills. There is a strong need to transmit digital technology skills to rural India for creating a balance between urban India and rural India and its success motivates the government for taking the step to build up digital technology in rural India. Women's access to education, employment, and equitable resources are need for digital skills. Women empower with the right decision-maker, fight against societal discrimination, and support them in a violence-free domestic environment with a sustainable future.

Conclusion

The present research attempts to expand and promote enterprises and make women entrepreneurs successful. This study concluded that digital skills have a very important role in the development of women entrepreneurs. The use of advancement in digital technology allows women to explore different sectors of entrepreneurship and work in the field they are interested in. It supports more edibility and fewer investments for certain task likes marketing, advertising and expanding their business. This study concludes that digital technology is a tool that rescues women entrepreneurs from poverty and empowers them with knowledge. Therefore, the advantages of digitalization should be manifested to all which will create a better platform for women entrepreneurs leading to a major growth of the economy in India. Digital skills are a great opportunity for rural women to compensate for their environmental deficiencies to carry out actions of entrepreneurship.

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STRATEGY FOR DIGITALIZED ADVANCEMENT OF INDUSTRIALIZED PRODUCTS: A QUALITATIVE ANALYSIS

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ABSTRACT

Digital advancement in the manufacturing industry to the part of that like this is a traditional flow of a manufacturing industry. Some bases like digital advancement and the four pillars of digital transformation cover the digital transformation in the core manufacturing, why manufacturing need to head first into the digital revolution and some of the key digital transformation trends like IoT and industry for decision science customer experience. It will be heading to the implementation aspect like how it will be implementing, how digitalized process can be implemented in organization. Manufacturing company uses automated technologies for the customer experience. Industry always starts with the supplier who provides the raw materials. Which supports the manufacturing process, so the raw materials are provided to the factory, where the manufacturing process happens and after the manufacturing process the product is sent for quality assurance aging and then it is stored properly so that it can be shipped to the customer in manufacturing flow. The digital transformation practices have the technologies and customer transformation process part of the digital transformation and the customers for the consulting the entire digital strategy for the customers derive the roadmap and help for deriving the right solutions for the digital transformation.

Keywords: *Digital advancement, digital transformation, decision science, digitalized process, manufacturing process, digital strategy*

Introduction

The digital revolution actually it starts with digitization so in manufacturing industries. An electronic manufacturer, who manufactures devices like a calculator, television and mobile phones those kind of stuff so this manufacturing company initially they produces these kind of devices and the data is not stored somewhere that means like they are following a traditional system but they are not digitizing the data anyway or computerization has not happened so first process what they have do is like entire customer data entire sales data whatever data related to their manufacturing process operational process that has to be computerized in a way that can be consumed to the future needs so this particular process of computerization very basic step that is called the digitization. It as conversion of data and the ultimate advantage of this digitization process is scalability security efficiency easy to process and economical to handle.

Next step is called the digitalization it is nothing but the adaptation of the process for example of the same manufacturer who it is the electronic cottage to end-users so this particular company they want to adopt some of the collaboration technologies, they want to interact with the customers and understand like what is the customer need or market need for their boosting up their particular business, for example like current rent like social media is getting a trend Facebook, Twitter and the social media analytics all those kind of items so this manufacturer things like. Now the IoT beat one digital transformation is the process of creation of business around it so here what happens is like.

The digital revolution can move to the next one so these are the four pillars of digital transformation so starting with the customer acquisition.

Customer acquisition is important stuff in case of a business to prove so here acquiring. customers can be done in an efficient way by designing personalized customer experiences so develop new offerings to enhance the customer experience engage with existing customers in friction-free way, so this particular pillar customer acquisition has got a lot of importance in case of digital transformation.

The second pillar is like business model so this is nothing but the business is a rolled out always based upon the market need or the customer need so the new data-driven or market data-driven market offerings are developed so understanding the customer analytics or understanding what kind of business will be helping the customers. What kind of business will be hit in the market that

kind of analysis will help you to derive business based upon the pure data and focus upon high margin offerings create differentiators then finding new ways to bundle existing services so these all are related to the business model revamping of a entire market or the existing market.

Third pillar is like culture it purely relates to the organization internal to the organization where is the backbone of the organization where the transparency with employees and customers has to be there fostering a culture of rapid experimentation so the culture is also aligning to digital beginning.

The fourth one is the core operations, where trying to optimize the operation so in part of bottom line increase in the bottom line so you how to optimize the operation, so that net profit is always increasing the core expenses are reducing, so this optimization can be done using digitalizing connecting and connecting the existing systems automating some of the processes in making some real-time decision of decision making process so all of these will helps to reduce the operational parameters operational cost and increase the bottom line effectively.

These four pillars are mainly considered for deriving a digital strategy for customers will move to the next one.

Methodology

Assortments of researchers have studied the role and importance of Industry 4.0 in present budding world. This part presents the methods used to research related studies on Industry 4.0 integrated manufacturing, robotics, Industry 4.0 modernization and prospect of Industry 4.0 explore directions. Information about modern production methods has been collected from the website and research article data and used for this analysis, as well as the notice in the current standard transfer in manufacturing technology.

In the circumstance of Industry 4.0, manufacturing systems are upgraded to a smart level. Smart Manufacturing uses highly developed manufacturing and information technologies to facilitate flexible, intelligent and reconfigurable manufacturing processes to meet dynamic global markets. These consequences are reliable with more broad-spectrum issues in smart manufacturing.

On the other hand, there are many articles related to the explore subject. To remove irrelevant searches, you need to optimize your searches. Toward this conclusion, evaluating this set of papers with a focus on standard applications of intelligence software, more specifically in smart manufacturing. The objective of this course is to only retain articles whose content is most relevant to the interests of Strategy for digitalized advancement.

Strategic Objectives

Spend an enormous amount of time thinking about the impact of technologies information and operations on individual organizations and that's probably appropriate and it's one of the reasons.

It also in the context though of the social impacts the broader impacts of industrial revolutions if going to invoke that sort of metaphor a fourth Industrial Revolution that perspective of global leadership.

In fourth Industrial Revolution, the technologies like analytics and artificial intelligence are blurring the lines between our physical and digital worlds this revolution is transforming industries economies and even society itself, business and government leaders prepared to harness the full potential of this era of Industry 4.0 in a way that benefits both industries.

Uncovered several significant findings first two out of three executives surveyed say businesses will have a greater influence in shaping the future of society than governments and other groups like NGOs and not-for-profits but that sentiment doesn't extend to themselves personally less than a quarter believe they or their own organization have significant influence over social factors like education sustainability and social mobility.

Executives surveyed are highly confident their organization can effectively leverage the changes brought about by industry 4.0 but this lack of confidence has not compelled executives to change their tactics many continue to focus on traditional short-term business operations over longer term strategies that create new value third only a quarter of executives are highly confident they have the

right workforce and skill sets needed for future success but talent.

Industry 4.0 will generate a innovative opportunities those who take a broad outlook will be the ones to thrive in this new era they will see connections between business and social needs between financial outcomes in innovative strategies between worker productivity in a changing workforce and between improving operations and creating new value the fourth Industrial Revolution has arrived.

Needs to Recognize the Digital Process

Nowadays the market is emerging in a way like there are lot of new any brands are coming so a word of the folks have the mindset of being an interpreter and they are aware of all these strategies how to become a very competitive or how to become a successful businessman, so these kind of business strategies are under brainers so entrepreneurial of strategies thought process is has created a very competitive market so the competitive market is emerging so what happens the new entrants keep on disrupting the market with their new ideas, new thought processes, new business models and which will cater the customers in different ways and in a seamless way so currently will happen new internet.

Companies should adopt more connected or a product centric quality management system approach as the complexity of a product increases with artificial intelligence and the internet of things robotics and the related 4.0 technologies qualitative must be unified system to identify issues and address audits and resolve quality incidents.

Strategies in Digital Transformation

Strategic innovations consolidation of manufacturing processes and adaptation of operating models and processes due to the new post covid 19 standard are the key priorities for 2021.post pandemic adaptation the goal of the upcoming period of restoration will be the transition to a new normal to new standards for operating models and manufacturing strategies that will lead through numerous in-house digital transformation projects including formalization of remote collaboration.

Migration to cloud Infrastructure businesses will gradually transform the networks and transition to a cloud-centric infrastructure which will be accelerated with the launch of 5G networks this shift will help expand the adaptability and improve the flexibility of the enterprise's digital infrastructure number two scaling enterprise IoT.

Data availability migration to cloud applications and a complex it infrastructure will facilitate the scaling up of smart manufacturing projects from shop floor to top floor across the value chain the growing number of available data and the scaling up of the industrial IoT paved the way for further improvement in manufacturing potential and supply process.

Optimization number four hybrid workplaces and intelligent technologies manufacturing companies and shop floors will become a place of technological transformation which will drive a socio-cultural shift artificial intelligence and machine learning will lead to the emergence of hybrid workplaces that utilize the tools of augmented intelligence a combination of human and machine cognitive abilities.

Transition to flexible and resilient operating models manufacturing companies and factories have already begun turning towards more flexible operating strategies following the pandemic in addition to lean manufacturing principles businesses will move to embrace a holistic approach towards digital transformation and process automation.

Predictive maintenance the growing availability of data and their analysis will accelerate the generational shift in maintenance management manufacturing enterprises will start to move from a preventive maintenance system to a predictive maintenance strategy.

Expansion of distributed manufacturing will be more prevalent in the wake of decelerating globalization and regionalization of supply chains and manufacturing.

Discussion on Strategic Challenges

Technologies can support digital transformation in some use cases in various manufacturing domains. With some recommendations for manufacturing companies as well as for IT services providers so in order to understand why digital

transformation is an important for manufacturers today.

The major challenges which manufacturers are facing today and these are reaching new customer groups and revenue areas reducing cost and efficiency pressure and increased competition and one way for manufacturers to address these challenges is to digital transform the way how they do business and how they operate.

Why digital transformation projects are challenging and basically the top reasons which I tend to hear most of the times, people don't have the right mindset they don't see the need for digital it's really transforming processes and this includes up or lower management but also normal team members right .There often is a perceived lack of innovation culture in the company and also very often.

It's challenging to come up with a business case meaning to have items by potential news cases and also have managed to build a business case.

It's challenging to determine which organizational structure works best and when to best invented digital initiatives in the organization of a company and last at least having only the traditional legacy.

To revenues or costs also prevent from establishing an innovative company culture or to change people's mindset toward the importance of digital transformation and innovation so these are the major constrains.

Conclusion

Companies have been successful and rapidly seeing benefits with much lower implementation costs and with fewer technical resources required in addition to connectivity many companies are focusing on automating their factories to improve through put quality and efficiencies in fact fully automated micro factories may be the new standard to address the many issues related to the trend towards more localized manufacturing. We have been focused on enabling the robotic factory of the future with our cloud applications and technology the objective is to support a completely automated end-to-end robotic manufacturing process from the point that a customer enters an order completed through an e-commerce portal allowing for configured personalization all the way through the manufacturing quality processes every step of the way is automated and managed to provide a controlled optimized and hands-free experience while personalization is driving the manufacturing requirements of the future it necessitates control through the ordering manufacturing release quality and manufacturing execution processes. Manufacturing into profit center hold the future in hand so that, there is no surprises coming up and that will industry for the digital process to help the industrialist to do that.

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IMPORTANCE OF MANAGEMENT INFORMATION SYSTEM IN BANKING SECTOR

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ABSTRACT

Management information system is playing a vital role in effective decision-making process in Banking Sector. In service industry, retention of customer is very important for success and growth. The objective of the research is to study the importance of Management Information System in decision making process. The adaptation and proper implementation of developed information system is the only key to compete with its rivalries and to sustain over position in the market. In India, banks like- State Bank of India, Axis Bank, ICICI Bank are implementing various MIS to reach out to their customers onone-to-one basis.

Keywords: *Service Sector, MIS, Customer Retention, Decision Making, Information, Centralized Core System, Transaction Processing System, Computerization*

Introduction

Success and growth of financial and banking system depends largely on data information. Quality information is essential for making good decision. In an organization necessary information can't be accumulated without the presence of proper information system. Hence, the very basic idea of having an information system is to supply appropriate and precise information at all the levels of management at right time to take necessary decisions.

Management information Systems (MIS) occupy an important role in drawing vital information for a logical and effective decision-making practice. It is generally employed to generate various reports after summarizing and analyzing the data obtained from different sources that is to be used for numerous specific as well as general requirements. The application of MIS helps in cutting down the baggy manual work and human errors; which may arise if these reports are processed manually. Thus, MIS summarizes the abundant data in a precise report which can be used by the decision makers in an organization.

Objectives of the Study

The researcher aims to accomplish the following objectives through this paper -

1. To study the role of Management Information System (MIS) in Banking Sector
2. To analyze the importance of Management Information System (MIS) in decision making process.

Methodology

In this paper the Descriptive Research Design is explored. It is placed when the researcher desires to describe specific behavior as it occurs in the current scenario. Due to existing covid-19 pandemic situation, the primary data could not be collected so the researcher has no other option but to go for secondary data only like- journals, related research papers and websites etc.

Review of Literature

Although there is less or almost no research has been conducted on this topic, yet a preliminary survey was conducted on various available literature or research work related to the topic so as to have an in-depth idea.

Tripathi Arun Prakash(2011) in his/ her study found that an effective information system is working in the ICICI Bank which benefits the bank by compressing the data by sixty percent (60%). achieving trickle-feed loading, allowing concurrent loading and queering, reducing the cost of maintenance, improving inquiry speed and response time etc. [1]

Bansal R. (2011) in his/her study pointed out that Canara Bank has achieved tremendous growth in its business after computerization of flow of information to top/executive level management. Information is precious for all banking institutions that is why the uninterrupted flow of information at all level of management is inevitably crucial to maintain the quality of information. [2]

Muliri J., Zeqo E., Mukli L., Como A. (2015) in their study found that most of the banks in Albania (a country in the southern Europe) had implemented Management Information System (MIS) for guiding day to day operations and also for strategic/tactical applications. The study also highlighted that Banks can process the data with the help of it so as to get accurate, qualitative and quantitative information within a reasonable time for decision making use. [4]

Devi Gurumayum Rosybala (2017) in her study highlighted that the earlier manual process of the bank causes a lot of inconsistency, irregularities and leads to error prone in calculation. But with the pace of development and emergence of computerized procedures many banks are shifting from manual process to automation. The main factors behind the computerization of banks in Manipur are – Government directions, necessity for change, easy communication and proper standardization. [5]

Gupta A.(2018) in his study concluded that Information System is important in all the functional areas of a bank like- Finance, Accounting, Marketing etc. adding to that it also helps the banks in managing cash, business risk and maintaining good relationship with its customers for long time. [7]

Discussion

a) Management Information System (MIS):

Management Information System (MIS) is a combined user arrangement that supplies the management accurate and timely information desired to initiate decision-making process and enable the organizations in planning, controlling, and performing operational functions effectively and efficiently with help of output information. The data must be first collected then stored, processed, analyzed and finally essential, accurate and quality information are distributed at managerial level.

There are some necessary components of Management Information System-

Hardware – Input/ Output Devices, Storage Space

Software – Process the available data, instruct the hardware component.

Data base – Location in the system where all the data will be programmed

Procedure – Set of documents that will give details the structure of MIS

People - Qualified people are another vital component of MIS like- development and operation managers, system analysts, database administrators and computer operators, programmers etc.

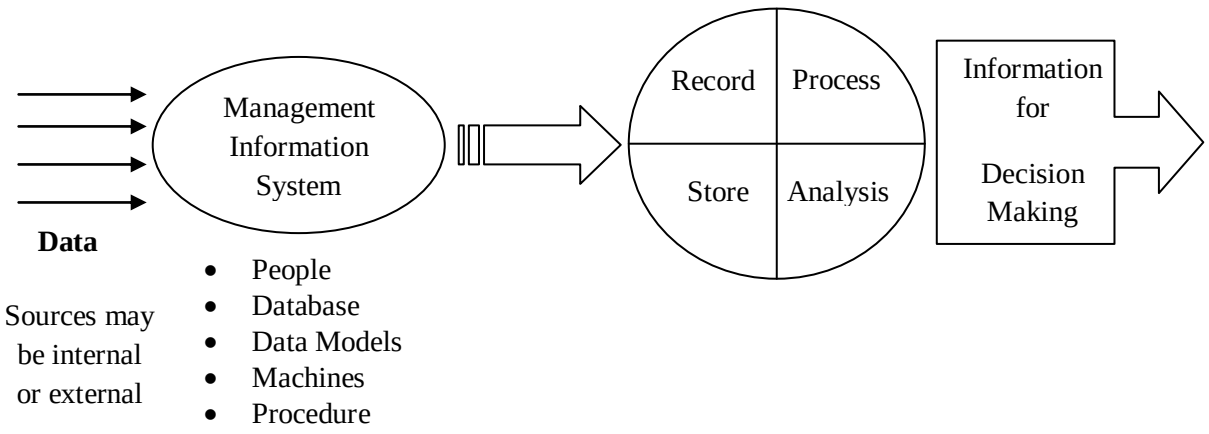

Figure 1: Structure of Management Information System

A decision is making a choice or selecting an option among various alternatives available. Decision making comprises of various steps/stages like- collection of information available, identification of various alternatives, evaluation of the alternatives and finally selection of the best alternative and follow up in future. In an organization, Management Information System has the prime accountability to support this process in all necessary steps by providing requisite information.

Generally, in an organization most of the decisions are taken by the top/executive level management, but some decisions are also taken by the lower/middle level management. Thus, Management information systems (MIS) generate prescribed and programmed reports based on data drawn out and summarized from the organization's basic Transaction Processing Systems (TPS) which is provided to the middle/operational level managers to spot out and inform various problems existing in the organization.

b) Management Information System in Banking Sector

The banking industry was once a simple and reliable business which received deposits/collected money from the surplus investors at lesser rate and granted loan to the borrowers at a higher rate of interest so as to earn profit in ordinary course. However, the deregulation and emergence of new technology in the market led to a revolution in the banking industry.

Now-a-days the success of banking sector depends on the superiority of the services and the capacity of the banks to meet the diverse needs of its clients. The adaptation of developed information system is becoming the only key to compete with the rivalries so as to sustain own position in the market.

However, Management Information System (MIS) is not a new model in the field of banking. Banks have been using this model for defining the practice of processing available data to generate various reports and then analyze the report so as to provide information to head offices/top level management for taking important decisions. Gradually, banks have undergone into a drastic change from the era of using information for operation purposes to the era of using information for strategic purposes.

With the advancement of time and need for maintaining high amount of data to be processed, MIS is becoming the primary need of every banking institution which helps in processing and storing data with the help of new tools like- Data Warehousing and Data Mining.

In India various banks are implementing Management Information Systems in their operations.

State Bank of India, the largest and oldest commercial bank in India, in order to have efficiency in operations and improvement in strategic areas like- trade finance, treasury etc. and to provide any time anywhere banking service; it has chosen TCS Limited Company to put into operation its core banking solution i.e.,**BaNCS** which is the largest Centralized Core System ever being implemented.

Axis Bank also implemented SunTec Business Solutions in order to create personalized bundles of service and to manage the billing process of payment. It improves the efficiency of the bank in managing the very complex billing function.

ICICI Bank has also implemented fully automatic Human Resources Management System (HRMS) for managing their Human Resource lifecycle, Finacle Customer Relationship Management software of Infosys Company for gathering customer information from all the major products- Deposits, Credit Cards, Loans etc. to serve the customer in a proper way than its competitors.

Findings

Management Information System is indispensable for the efficient working of banking services. It is noticed that MIS is reclaimed as a most important component in developing competitive products and services that gives an entity comparative advantage in the market. A bank having proper MIS gets following benefits over its competitors -

- Assists the banking institutions in highlighting their strong point and weak point by providing timely revenue reports, hire hands' overall performance record etc which helps them in taking corrective measures and improve their operations accordingly.
- Generally, there is price-based competition in the banking sector in terms of Interest rates charged. Management Information System can change the basis of competition with the improvement of means for processing the data; thereby the bank will

be in a position to create unique product feature.

- Helps in pleasing the statutory requirement prescribed by the Reserve Bank of India (RBI) from time to time like- Filling Statutory returns for working out various commitments in electronic format. Recently the RBI announced filling of report by every bank with it on maintaining cash in ATM machines from October 2021 onwards. Thus, with the help of MIS every bank can meet such commitments too.
- One tip distribution of accurate information at various levels like- Corporate managers, Key Executives becomes very easy. It facilitates the manager to take timely and informed decisions.
- It helps in communicating with the various departments of the bank by employing a centralized operation system. Centralized system reduces cost of operating multiple platforms and increases user convenience. Adding to this, head/registered offices will be in a position to take correct decisions with the help of information available from various branches across the country and evaluating the branch's performance.
- In the era of digital marketing information plays a significant role in the promotion of the products of a business. Management Information System provides accurate information related to the customer requirement by identifying the changing consumer buying behavior through the analysis of sales and revenue reports that helps in designing the banking products (or services) in align with the diverse needs and wants of the customers.
- Reporting Mapping is a tool of Management Information System with the help of which system generates monthly, weekly reports as per the requirement and need of the customers so as to curtail the manual procedure and ensure customer convenience.
- MIS provides time utility to the banking institutions by delivering required information within a short period of time without the fear of manual manipulation.

Thus, it is seen that banks with a distinct and competent information system will generally have a comparative advantage over its competitors having poor or no Management Information System. However, the measurement and definition of efficiency of MIS is easy but the adequate/proper implementation of its effectiveness in actual scenario is very difficult.

Problems

Although Management Information System plays an important role in a bank yet there are some problems associated with its proper implementation.

- The majority of banks does not have the modernized management information system and are still depending on the old MIS having long routine using paper work to maintain the proper workflow.
- Past data are indispensable element for a superior decision-making process but the irony is that in some cases past data are missing as they are not recorded in files, thereby making difficult the process of obtaining, summarizing and scrutinizing the data so as to provide information within minimum time.
- The routine transactions and the reporting process are not fully made automated in some cases.
- Actual information provided(output of the system) is not satisfactory because most of the data are sorted out manually and hence the information may get delayed and contain errors due to manual processing of data.
- Another problem is the lack of proper communication among the various departments. Sometimes information is available but managers may or may not aware of it and sometimes there is a gap between the required and available information too.

Conclusion

Management Information System helps in operation and decision-making process. Various data are inserted as input and its summarize form helps in reducing overload of information. Through the system data are inserted and assembled, and then stored information is evaluated. Management

Information System can be used in various department such as marketing management information system, financial management information system etc. on the basis of requirement of the organizations. Quality of decision can be enhanced through relevant information provided by the system.

Recommendations

There is indeed a need for well-organized and sound implemented Management Information System (MIS) in a bank so as to take correct and quick decision by management and to ensure proper flow of information required at all level. Although there are some problems which affects seriously on proper implementation of MIS yet some measures the researcher wants to suggest through this paper

- Awareness Programs about information technology need to be organized for the banking staffs so as to-
  - Remove the gap between human decisions and system decisions.
  - To communicate the way measurement of weaknesses and symptoms of inadequate Management Information System
- Banks should give emphasis on having proper governance of the information systems and adequate security controls to safeguard information and the system.
- Timely up gradation of technology is necessary to eliminate the occurrence of errors in the system.
- Bank should formulate certain moral standards and responsibility for the users or the decision makers in order to eliminate unethical use of information (output).
- Proper Training has to be there for enhancing the level of knowledge and skills of the employees at different levels including executives regarding information technology.

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INSTITUTION AND INDUSTRY LINKAGE IN ENGINEERING COLLEGES NEED AND CHALLENGES

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ABSTRACT

Institution-industry linkage is considered as a strategy to equip students, with theoretical and practical knowledge. The purpose of this research was to investigate the need for institution and industry linkage and to identify the challenges in establishing institution and industry linkage in Engineering colleges. The participants were engineering students. 40 students were selected through convenience sampling technique. Pilot study is also undertaken to judge the validity and reliability of data. The present study is primarily exploratory and descriptive in nature. The data were collected through questionnaire and interview and analyzed through percentage analyses, Anova and weighted average ranking method. The results are presented thematically within three categories including socio economic factors, perceptions and challenges.

Keywords: *Industry linkage, Training, Career Development, Employment, Engineering, Professional Skills*

Introduction

Institution and Industry Linkage expresses the relationship between manufacturing / service industry and higher educational institutions. Expectation of industry regarding right employee for right job is to be fulfilled by educational institutions. Teaching and training are two sides of a coin of education. There is dynamism in labor requirements in industrial units whereas there is a static academic curriculum taught in educational institutions to students. Here is a mismatch. It does not meet the labor requirements of industrial units, which makes a question for research. What are the plans needed to make students of higher educational institutions employable in industrial units matching employment requirements and to be entrepreneurs on their own? A research study is needed to answer this question. It is presumed that industrial linkage will create employment competencies and entrepreneurial competencies to students of higher educational institutions. Land, labor, capital and organization are four factors of production. It is the responsibility of higher educational institutions to teach, train and practice the students for acquiring the four factors of production for development of industries in a country. Industrial development contributes to employment development.

Students of engineering and arts and science colleges get degree for the years they spend in colleges. But degrees and high marks do not provide employment, even self-employment becomes difficult. Basic subject knowledge and ability to express the knowledge is an essential academic requirement to a student. Participation in seminars, group discussions, competitions, cultural programs will help students to express their learning in the class room and other related aspects. Class room alone cannot create a versatile student to become employable in future. Knowledge prevails outside class room (employment opportunities and skills needed to get employment) contributes to a major part of career determination and success of graduates.

Literature Review

Many theoretical and empirical studies indicated that internship has positive effects in engineering education. Engineering and technology students learn to gain a lot of experience from different approaches. According to Prabhu, B. V. (2016), student internship plays a major role in transforming the engineering interns to ready-to-use professionals. The researcher identified and discussed those issues and provided a framework for effective learning and above-mentioned transformation considering the engineering industry. The role of the faculty is very important to successfully pursue an internship program. In the words of Garcia, R. & Puig, J. (2011), Work Internship Placements (WIP) is a new and transversal enterprise internship program, which is focused on quality improvement, academic control and satisfaction of collaborating enterprises. The fundamental WIP infrastructure combines a web-based intranet platform, that provides a

complete set of WIP tools, with a protocol of procedures and tasks that are observed and followed at all internship stages by every participating agent, i.e. enterprises, students, coaching professors and administrative staff. Martín-Lara et. al. (2019) revealed that the majority of students were satisfied with the internship program. Students recognized that the possibility of carrying out the internship abroad and improve the soft skills are some of the advantages of the internship offer of master's degree. In fact, most of them prolonged their training period in order to perform their final Master project in the research center where they had carried out their internship. Some aspects should be improved, namely the communication between the academic tutor and the students, the information and guidance in the internship selection or the proposal of practices in more varied sectors. Internship program helps engineering students to acquire a new concept and idea that does not cover in classroom instruction. According to Marsono, Sugandi, Tuwoso, and Purnomo (2017), Sisay and Eshetie (2018) found out that lack of strict placement procedures, limitations of academic mentorship, and poor supervising practice in the industry are the major challenges of the internship mentoring program. Kaul, Ferguson and Yanik (2019) studied the impact of leveraging peer mentorship and vertical integration in a project-based learning environment, and reported that the program helped students to improve their academic achievement. Brush, Hall, Pinelli and Perry (2014) also studied interns and mentors' knowledge and skills and perceived importance of these skills in engineering and science careers; the researchers reported that the internship mentoring program is helpful to gain written and oral communication skills, decision-making skills, collaborative work, innovation, time management, critical thinking, and technical skills. Zerihun (2019) also studied the challenges facing in the internship program. The researcher reported that inadequate guidance support, funds, and lack of enough time are the major challenges of the internship program. Charles, 2016 in his study revealed that students can expect to gain experience and exposure to both technical and general competencies. Though research and policy relating to technical fields have emphasized professional competencies such as teamwork, communication, and professionalism, this analysis suggested that the internship postings greatly emphasized technical skills at the expense of general competencies. Learning at the workplace has become a challenge for the interns due to several issues. A knowledge gap analysis has been depicted considering all stakeholders of the internship, including the intern, faculty, institution and the industrial organization Prabhu, B. V. (2016).

Research Objectives

1. To study the socio – economic profile of engineering students
2. To investigate the need for institution and industry linkage in Engineering colleges
3. To identify the challenges in establishing institution and industry linkage in Engineering colleges

Research Methodology

The main purpose of the study is to investigate the engineering student's perception and challenges faced by them in pursuing an internship program. Convenience sampling is used to identify sample respondents in engineering students. The sample size is 40. Pilot study is also undertaken to judge the validity and reliability of data. The present study is primarily exploratory and descriptive in nature. The research considered both qualitative (interview) and quantitative (questionnaire) approaches in which they were collected simultaneously through embedded research design (Creswell, 2012). The questionnaires scaled with 5 Likert scales (5=strongly agree, 4= agree, 3= no idea/neutral, 2= disagree and 1=strongly disagree). The data was analyzedthrough percentage analyses, Anova and weighted average ranking method.

Results

The results are presented thematically within three categories including socio economic factors, need and challenges.

Socio Economic Factors of Engineering Graduates : Socio Economic Factors includes Gender of the respondents, Studying year, and Department.

Table 1: Socio Economic Factors of Engineering Students

S.No.	Gender	Number of Respondents	Percentage
1	Male	23	57.5
2	Female	17	42.5
	Total	**40**	**100**
S.No.	**Year**	**Number of Respondents**	**Percentage**
1	I Year	8	20
2	II Year	16	40
3	III Year	8	20
4	IV Year	8	20
	Total	**40**	**100**
S.No.	**Department**	**Number of Respondents**	**Percentage**
1	Civil Engineering	7	17.5
2	Mechanical Engineering	9	22.5
3	Electronics & Communication Engineering	12	30
4	Electrical and Electronics Engineering	7	17.5
5	Information Technology	5	12.5
Total		**40**	**100**

Source: Primary Data

Inference

Table 1 reveals that, majority of 23 respondents are Male (57.5%) and 17 respondents are Female (42.5%).

It is observed that majority of 16 respondents are second year students (40%) and 8 respondents each for first year (20%), third year (20%) and fourth year (20%).

Table 1 shows that majority of 12 respondents are Electronics & Communication Engineering students (30%) followed by 9 Mechanical Engineering students (22.5%), 7 Civil engineering and Electronics Engineering students (17.5%), 5 Information Technology students (12.5%).

Need for institution and industry linkage in Engineering colleges

Hypothesis

Null Hypothesis (Ho): There is a significant relationship between need for institution and industry linkage in Engineering colleges and department.

Alternate Hypothesis (Ha): There is no significant relationship between need for institution and industry linkage in Engineering collegesand department.

Table 2: Analyses of Variance of Need for institution and industry linkage in Engineering colleges and Departments

ANOVA						
Particulars		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Career guidance	Between Groups	38.425	5	7.685	11.131	.000
	Within Groups	23.475	34	.690		
	Total	61.900	39			
Entrepreneurship development	Between Groups	13.423	5	2.685	6.272	.000
	Within Groups	14.552	34	.428		
	Total	27.975	39			
Gaining work experience	Between Groups	26.731	5	5.346	35.164	.000
	Within Groups	5.169	34	.152		
	Total	31.900	39			
Networking with professionals	Between Groups	11.798	5	2.360	2.974	.025
	Within Groups	26.977	34	.793		
	Total	38.775	39			
Improved skills and knowledge	Between Groups	31.200	5	6.240	5.829	.001
	Within Groups	36.400	34	1.071		
	Total	67.600	39			

Source: Primary Data (Computed Table)

Inference

Table 2 shows that there is a significant relationship between career guidance and Department as the significant value are .000. Hence the null hypothesis is accepted.

From Table 2, it is clear that there is a significant relationship between Entrepreneurship development and Department as the significant value is .000. Hence the null hypothesis is accepted.

Table 2 indicates that there is a significant relationship between gaining work experience and Department as the significant value is .000. Hence the null hypothesis is accepted.

Table 2 shows that there is no significant relationship between networking with professionals and Department as the significant value are .025. Hence the null hypothesis is rejected.

Table 2 shows that there is a significant relationship between improved skills and knowledge and Department as the significant value are .001. Hence the null hypothesis is accepted.

Challenges in establishing institution and industry linkage in Engineering colleges

Table 3 : Actual score of challenges faced by engineering students in internship program

S.No	Particulars	5	4	3	2	1	Total
1.	Technological gap between Institution and Industry	16	4	3	11	6	40
2.	Lack of financial resources and entrepreneurial mentality (deposition to take risks)	9	11	5	11	4	40
3.	Lack of mechanism for developing industrial relationships	24	4	10	1	1	40
4.	Lack of compatibility	4	27	5	2	2	40
5.	Lack of collaborative experiences	3	22	4	7	4	40

Source: Primary Data (Computed Table)

Table 3 discuss that the actual score gained for the each statement of problem. The researcher has given the actual score as per the descending order from 5-1 (5-Strongly agree, 4-Agree, 3-Neutral, 2-Disagree, 1-Strongly disagree).

Weight score and Rank of challenges in establishing institution and industry linkage in Engineering colleges

The following table will display the weighted average score and rank of the challenges in establishing institution and industry linkage in Engineering colleges. Mean score can be calculated by using the following formula.

$$\text{Mean Score} = \frac{\text{Total Weight Score}}{\text{Total Respondents}}$$

Table 4: Weight score and Rank of challenges in establishing institution and industry linkage in Engineering colleges

S.No	Particulars	Weight						Mean	Rank
		5	4	3	2	1	Total		
		Weight Score							
1.	Technological gap between Institution and Industry	80	16	9	22	6	133	3.33	III
2.	Lack of financial resources and entrepreneurial mentality (deposition to take risks)	45	44	15	22	4	130	3.25	IV
3.	Lack of mechanism for developing industrial relationships	120	16	30	2	1	169	4.23	I
4.	Lack of compatibility	20	108	15	4	2	149	3.73	II
5.	Lack of collaborative experiences	15	88	12	14	4	133	3.33	III

Source: Primary Data (Computed Table)

Table 4 shows the weighted average score and rank of the challenges in establishing institution and industry linkage in Engineering colleges. The researcher has given weights from actual score on to base of descending order from 5-1.

Inference

From the above table, lack of mechanism for developing industrial relationships is the major challenges in establishing institution and industry linkage in Engineering colleges, as it is ranked I. Followed by lack of compatibility as Rank II, technological gap between Institution and Industry and lack of collaborative experiences as rank III and lack of financial resources and entrepreneurial mentality (deposition to take risks) as rank IV.

6. Discussions and Implications

The purpose of this research was to investigate the need for institution and industry linkage and to identify the challenges in establishing institution and industry linkage in Engineering colleges. The researcher indicated that engineering students are in need of an effective institution and industry linkage. They perceived that linkage between institution and industry is necessary to develop their knowledge and career related skills. Simultaneously there exist some challenges in establishing industry linkage in engineering colleges.

This research finding indicated three implications on approaches to institution and industry linkage. Firstly, there should be an appropriate framework for institution and industry linkage in engineering colleges. Second, supervisors should know the suitable ways of guiding and assisting students to achieve the designed objectives. Lastly, trainers, administrators, and other stakeholders should work closely to minimize the challenges that impact the practice of industry linkage.

This study has certain limitations whereby this study has limitations given the time and constraints of factors faced by researchers. The data were collected only from students, and it did not include specific organizations or company representatives. Therefore, future study is required by considering large samples and organizations. Secondly, further research is crucial to observe the effect of institution and industry linkage on students' academic achievement, psychological development, future career, and communication development through an experimental study.

7. Conclusion

This research was aimed at examining the need for institution and industry linkage and to identify the challenges in establishing institution and industry linkage in Engineering colleges. Engineering students are highly benefitted through institution and industry linkage. They require and have good positive perceptions on institution and industry linkage. Further they expect more linkages with industries which will help them to gain practical work related knowledge which will help them to hold better employment opportunities. Likewise, there exist some challenges in establishing industry linkage in engineering colleges, which can be solvable to some extent.

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SYNTHESIS AND OPTICAL CHARACTERIZATION OF DYSPROSIUM DOPED STRONTIUM CALCIUM ALUMINATES BASED NANOPHOSPHOR FOR YELLOW LIGHTING APPLICATION

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ABSTRACT

Divalent dysprosium doped strontium calcium aluminates nanophosphors were composited supported by combustion methodology. The photoluminescence effects of these Dy^{2+} activated $SrCaAl_{12}O_{19}$ nanophosphors showed yellow luminescence and disclosed magnificent emission properties in their particular regions of color coordinates. On the basis of excitation wavelengths, emission peaks were obtained at 573 nm. The main peak in the emission spectra was attributed to $^4F_{9/2}\rightarrow{}^6H_{15/2}$ transition of Dy^{2+} ion. The formative and morphological research was executed by the evaluation of X-ray diffraction figuration, scanning electron microscope (SEM) illustration, and transmission electron microscope (TEM) appearance.

Keywords :- *Yellow luminescence , CIE chromacity , Nanophosphors , Color coordinate; Combustion methodology*

Introduction

Rare earth doped aluminates nanophosphors have a good thermal stability inclusive of eminent luminescent performance and their color purity, consequently these are used for the various usance of display and lighting devices [1- 2]. Over the last few years different display technologies are developed that uses the potential to provide display of high lighthtness and low power utilization. Yellow emitting phosphor materials have been playing a major role in the enlargement of these advanced lightening and display technologies [3–5]. The 4f electrons of rare earth ions are responsible for optical and electronic properties to these aluminates oxide lattices. Thus, these materials have been put to use in the field of optical transmission, and medical diagnosis and have been used for numerous applications [6].The emerging of Dy^{2+} doped phosphors are applicable materials as they expose extremely intense emission of light. For the unification of Dy^{2+}, the taken lattice should be having two or more locality. These localities are also reduced distant for backing fast energy transfer between ions. Consequently, the prevailed phosphors will be highly intense even in contempt of low doping concentration of rare earth ion. Hence, above both conditions are suitable with these $SrCaAl_{12}O_{19}:Dy^{2+}$. Consequently, Dy^{2+} doped $SrCaAl_{12}O_{19}$ luminescent materials are more significant than other phosphors. A short time ago, $SrCaAl_{12}O_{19}$ aluminates oxide lattices have been searched as potential lattices for the synthesis of rare earth activated phosphors [7-8]. All the powder samples of O_{19}: Dy^{2+} series show bright yellow emission and Dy^{2+}ions substitute the Sr^{2+} ions available in two nonequivalent sites providing the $^4F_{9/2}\rightarrow{}^6H_{15/2}$ transitions [9]. In general , aluminates based phosphor materials are synthesized by various method , namely , solid state reaction , sol-gel , precipitation , solvothermal , and combustion [10-11] . Basically these methods need high temperature which causeses large amount of coarse materials and after that has to be grinded to get the fine particles. By using grinding process phosphor surfaces could damages and the , resulting emission intensity of phosphor samples reduced. Comparatively combustion process has bring more attention due to less reaction time and low reaction temperature .By this method more homogeneous products of fine size could be obtain .

Materials and methods

Synthesis of $Sr_{0.95-x}Ca_{0.05}Al_{12}O_{19}:Dy_x^{2+}$ Phosphor

The Dysprosium doped $SrCaAl_{12}O_{19}$ nanophosphors were synthesized by the combustion practice. High purity (99.9% purity) strontium nitrate [$Sr(NO_3)_2$] (0.219gm) , calcium nitrate tetra hydrate[$Ca(NO_3)_24H_2O$] (0.01311 gm) , aluminum nitrate nonahydrate [$Al(NO_3)_39H_2O$] (5gm) , Dysprosium nitrate

hexahydrate [Dy $(NO_3)_3 \cdot 6H_2O$] (0.0056 gm), and calculated urea (NH_2CONH_2) (2.11 gm) as fuel were used as raw materials to synthesize $Sr_{0.9355}Dy_{0.0145}Ca_{0.05}Al_{12}O_{19}$. Amount of urea fuel was considered using total oxidizing and reducing valences of materials [12] .A small amount of distilled water, were frenzied on a preheated hot plate controlled at 90°C which formed a smooth white quaggy paste within a few minutes. After a smooth mixing the mixture was then shifted to a preheated furnace at 580°C [13]. On heating, the mixture vaporized and burn, with a large amount of gasses, to give strontium calcium aluminates phosphor materials. Whole action was finished within a few minutes. For better crystallinity, the phosphors were reheated in the muffle furnace at 900°C for two hour. The chemical reaction for combustion of the reactants is represented as follows:

0.95-x Sr $(NO_3)_2$ + 0.05 Ca $(NO_3)_2$ + 12 Al $(NO_3)_3 \cdot 9H_2O$ + x Dy $(NO_3)_3 \cdot XH_2O$ + NH_2CONH_2 ⟶ $Sr_{0.95-x}$ Dy_x^{2+} $Ca_{0.05}Al_{12}O_{19}$ + (H_2 + N_2 + NH_3 + O_2 + CO_2+ H_2O) (Here x = 0.0000, 0.0145, 0.0245, 0.0345, 0.0445)

Characterization of $Sr_{0.95-x}Ca_{0.05}Al_{12}O_{19}:Dy_x^{2+}$ Phosphor

The phase purity was decisive by implementing the XRD patterns using a X-ray Diffractometer with Cu Ka radiation (= 1.54178) at a scanning rate of in 2θ range from 25° to 70°. The morphology of the phosphors was characterized by scanning electron microscopy and transmission electron microscopy. The photoluminescence (PL) measurements were recorded with a Fluorimeter SPEX Fluorolog 1680 (USA) equipped with the SPEX 1934 D phosphorimeter having Xenon lamp as excitation source.

Results and discussion

Powder X-ray diffraction (PXRD) analysis

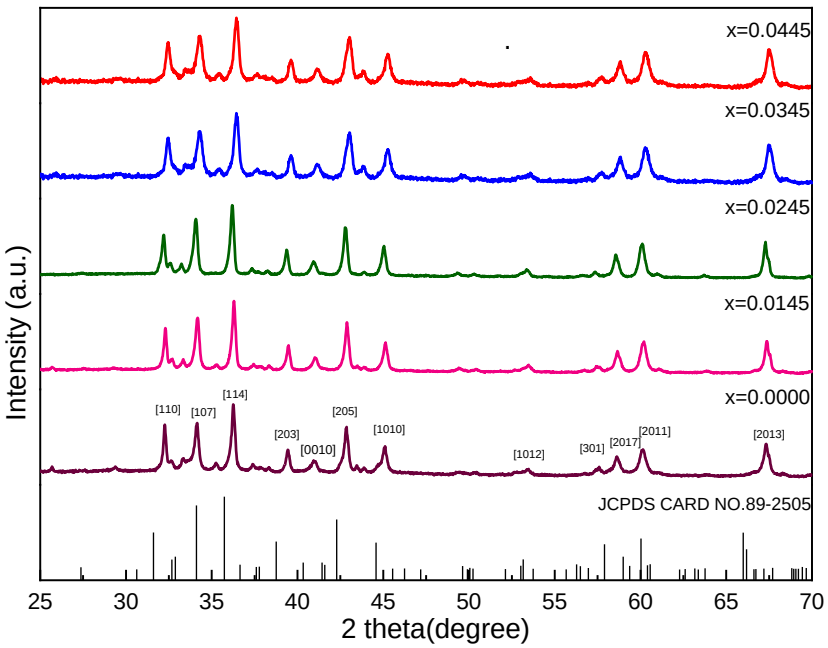

Fig .1. Experimental Powder XRD profiles of the $Sr_{0.95-x}Dy_{0.03}^{2+}$ $Ca_{0.05}Al_{12}O_{19}$ Dy_x^{2+}(x = 0.0000 , 0.0145 , 0.0245 , 0.0345 , 0.0445) phosphor together with the standard pattern of $SrAl_{12}O_{19}$(JCPDS file no 89-2505)

XRD patterns of $SrCaAl_{12}O_{19}:Dy^{2+}$ phosphors are presented in Figures 1. recorded in a 2θ range of 25° to 70° verses intensity . All the diffraction peaks of strontium calcium aluminates nanophosphors matched with JCPDS card number 89-2505 [14],. There were no traces of impurities or additional phase formation due to the doping of Dy^{2+} ions in the host samples. This confirms that the Dy^{2+} ions did not form any other impurity phase and have incorporated well into the $SrCaAl_{12}O_{19}$ host lattice. The shifting of the peak-position due to

the Dy-doping can also be inspected from Fig. 1 The probability of Dy^{2+} ions occupying the Sr^{2+} site is higher, owing to their compatible ionic radii. However, there is a marginal difference in their ionic radii (Sr^{2+} = 1.18Å and Dy^{2+} =1.07Å) that has led to the shifting of the peak positions with increasing Dy^{2+}concentration. Results and discussion Structural studies XRD pattern of $SrCaAl_{12}O_{19}$ nanoparticles prepared by combustion method is shown in Figure 1. The peaks in the XRD patterns are sharp, which indicates the nanocrystalline nature of the sample. Various intensities of the diffraction peaks arising from the planes, such as [110] , [107] , [114] , [203] , [205] , [1010] , [1012] , [301] , [2017] , [2011] , and [2013] lattice planes of hexagonal phase ($P6_3/mmc$) confirm the formation of $SrCaAl_{12}O_{19}$ nanoparticles. The intensity of the diffraction peak at the [114] plane is stronger, and reveals that more crystallites. The average crystallite size of $SrCaAl_{12}O_{19}$ nanoparticles obtained by using Debye–Scherer formula ($D = \frac{K\lambda}{\beta \cos\theta}$) where λ is the wavelength of X-ray radiation [15], and β is the full width at half maximum (FWHM) of the peaks at the diffracting angle θ, is found to be 32.14 nm. The lattice parameters are evaluated using ($\frac{1}{(dhkl)\mathbf{2}} = \frac{h2}{a2} + \frac{k2}{b2} + \frac{l2}{c2}$) [16] and the lattice constants and cell volumes are given in Table 1

Table 1 Comparison of lattice constant and cell volume of $SrCaAl_{12}O_{19}$

lattice Parameter ($a = b \neq c$)	Standard value ($SrAl_{12}O_{19}$)	Observed Value ($SrCaAl_{12}O_{19}$)
a (Å)	5.666(2)	4.80
c (Å)	22.00179(8)	21.86
Cell Volume $(Å)^3$	590.43	503.65

Morphology study

The morphology of these materials was analyzed using the scanning electron micrographs and transmission electron micrographs which are presented in Figures 2(a), 2(b), 2(c), , 3(a), 3(b), and 3(c), respectively. SEM micrographs of these phosphors indicated the narrow size distribution of cluster and hexagonal shape particles as shown in Figures 2(a), 2(b), and 2(c). From these SEM images, it is clear that the tip of every particle had hexagonal morphology of grossed particles. SEM micrographs exactly cannot compute the particle size of nanophosphors but TEM images can allow adequate correctness of crystal sizes in accordance with crystal sizes as calculated from XRD with the help of Scherer equation [17]. In TEM micrographs, the particle size of $SrCaAl_{12}O_{19}$:Dy^{2+}materials varied in the range of 15–35 nm. While the element presented in the Dy-doped $SrCaAl_{12}O_{19}$ phosphor , as displayed in Fig.2(d), were Dy, Sr , Ca , Al and O only.

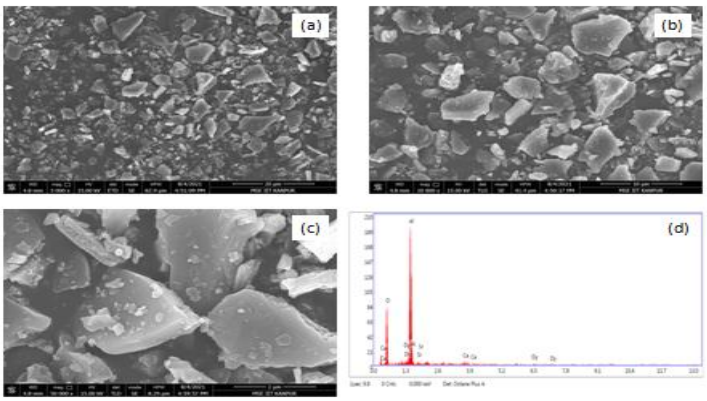

Fig .2. SEM images and EDS Spectra of the $Sr_{0.95-x}Dy_{0.03}{}^{2+}$ $Ca_{0.05}Al_{12}O_{19}$ $Dy_x{}^{2+}$(x =0.0445) at different resolution.

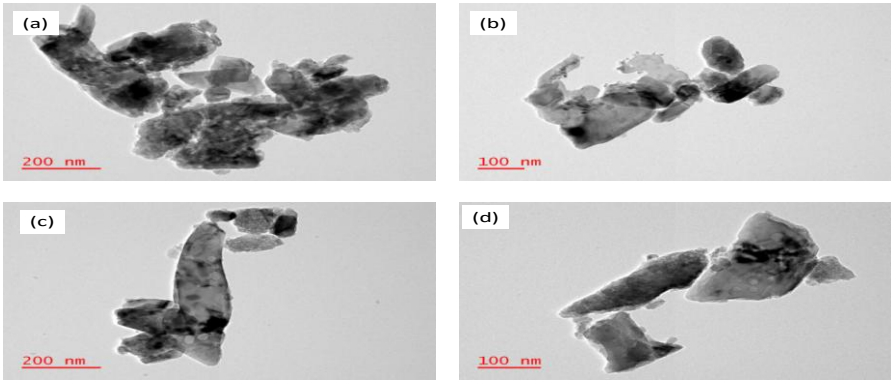

Fig 3. TEM images of the $Sr_{0.95-x}Dy_{0.03}^{2+}$ $Ca_{0.05}Al_{12}O_{19}$ Dy_x^{2+}(x =0.0445) at different resolution

Photoluminescence (PL) analysis

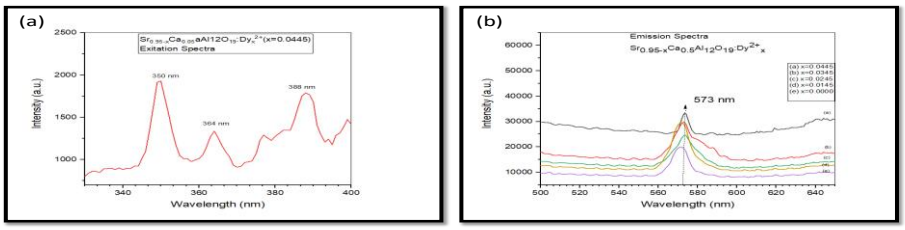

Fig 4. Excitation and Emission spectra of the $Sr_{0.95-x}Dy_{0.03}^{2+}$ $Ca_{0.05}Al_{12}O_{19}$ Dy_x^{2+}(x = 0.0000 , 0.0145 , 0.0245 , 0.0345 , 0.0445)

The doping of Dy^{2+} ions in $SrCaAl_{12}O_{19}$ host lattice are a very compelling characteristic. Different reports were given by different authors for the photoluminescence characteristics of Dy^{2+} ions. As actively it is not quite easy for Dy^{2+} to replace Sr^{2+}due to different valence states; but the size of Sr^{2+} (1.18 Å) is also comparable to that of Dy^{2+} (1.07Å). [18-19] so due to having almost similar size and valence state there are maximum probabilities for the replacement of $Sr2^{+}$ ions by Dy^{2+} ions. Figures 4(a) show the photoluminescence excitation spectra of $Sr_{0.95-x}Dy_x^{2+}$ $Ca_{0.05}Al_{12}O_{19}$ Dy_x^{2+}(x= 0.0445) phosphors by monitoring the emission wavelength at 573 nm. Broad bands in PLE spectra appeared due to charge transfer and sharp peak are obtained due to 4f -5d transitions of Dy^{2+} ion. [20]The charge transfer band (nm) is due to the charge transfer between the completely filled 5s orbital of Sr^{2+}ion and the partially filled 4f orbital of Dy^{2+} ion and its position depends strongly on the host lattice. The sharp excitation peaks of Dy^{2+} ions are ascribed to the electronic transitions ($^6H_{15/2}\rightarrow{}^6P_{3/2}$) at 350 nm, ($^6H_{15/2}\rightarrow{}^6P_{5/2}$) at 364 nm, and ($^6H_{15/2}\rightarrow{}^5P_{7/2}$) at 395 nm. The emission peak lying at 573 nm is observed due to transitions from $^4F_{9/2}\rightarrow{}^6H_{13/2}$ energy levels of Dy^{2+} ions. The origin of these transitions (electric dipole or magnetic dipole) from excited state to the ground state depends upon the location of Dy^{2+} ions in $SrCaAl_{12}O_{19}$ lattice and the type of transition is determined by selection rule [21].. Fig 5 shows the CIE chart of $Sr_{0.95-x}$ $Ca_{0.05}Al_{12}O_{19}$ Dy_x^{2+}(x = 0.0000, 0.0145, 0.0245, 0.0345, 0.0445). The color coordinates are calculated using the GoCIE software utilizing emission spectra and are reported in Tables 2. It has been seen that the coordinates of CIE chromaticity for varying concentrations of Dy^{2+} activated $SrCaAl_{12}O_{19}$ lie in the yellow region. The tallied values of CCT are inducted in Tables 2. From the results,

it can be observed that the prepared Dy^{2+} doped $SrCaAl_{12}O_{19}$ phosphor material is an application in hurricane lamps and cash light on living places and solid state lighting.

Table 2 Correlated coordinates of chromacity (x,y) and correlated color temperature (CCT) for $Sr_{0.95-x}Ca_{0.05}Al_{12}O_{19}$ Dy_x^{2+}(x = 0.0000, 0.0145 , 0.0245 , 0.0345 , 0.0445)

Sr no	Dy^{2+} Concentration	Color coordinate		CCT (K)
		X	y	
1	0.0000	0.461	0.520	3380
2	0.0145	0.463	0.521	3360
3	0.0245	0.462	0.523	3382
4	0.0345	0.464	0.524	3362
5	0.0455	0.465	0.522	3339

Conclusion

The series of yellow light emitting phosphors, that is $Sr_{0.95-x}Ca_{0.05}Al_{12}O_{19}$ Dy_x^{2+}(x = 0.0000, 0.0145 , 0.0245 , 0.0345 , 0.0445) was successfully synthesized using a combustion process using urea as fuel. The XRD patterns confirmed the hexagonal structure of $SrCaAl_{12}O_{19}:Dy^{2+}$. Crystal sizes obtained from TEM images of phosphors were found in nanorange and were found

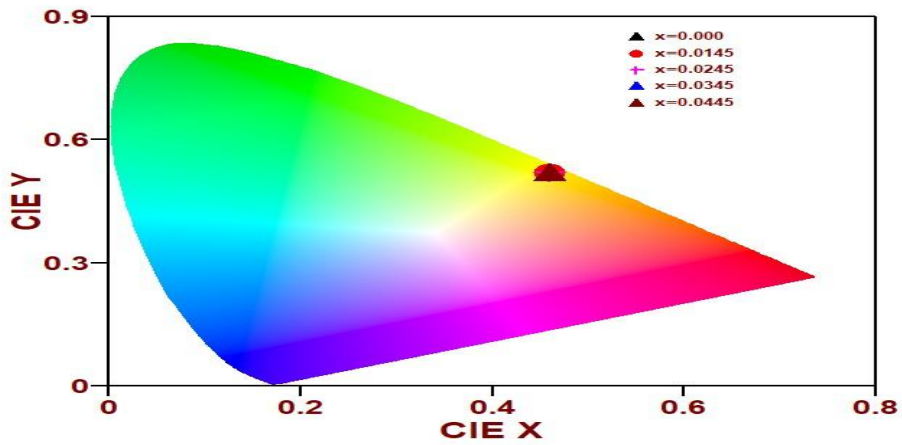

Fig 5 CIE Spectra for $Sr_{0.95-x}Ca_{0.05}Al_{12}O_{19}$ Dy_x^{2+}(x = 0.0000 , 0.0145 , 0.0245 , 0.0345 , 0.0445)

in good agreement with the sizes calculated from XRD patterns. Photoluminescence spectra for all phosphors were provided emission at about 573 nm. Emission intensity of $Sr_{0.95-x}Ca_{0.05}Al_{12}O_{19}$ Dy_x^{2+}(x =0.0445) nanophosphors was found maximum than the other prepared materials of this series. These prepared phosphors are having efficient light emitting properties that could be suitably used for various solid state lightening applications, hurricane lamps and cash light on living places

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FIGHTINGCLIMATE CHANGE, THE ORGANIC WAY: AN ETHICAL DISCOURSE

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ABSTRACT

In times when human intelligence has failed miserably in fighting a global pandemic, there is a bigger threat looming: Climate Change (CC). Agriculture will be affected by CC while also contributing to it. Emissions of Green House Gases (GHGs) from agriculture are expected to increase considerably, while on the other hand CC is expected to dramatically change agricultural production. Organic Agriculture (OA), an ecological production management system, claims to hold considerable potential for fighting CC. But such claims have been widely criticized by the scientific community around the globe. The current research paper reviews the ethical principles governing OA and CC mitigation through an in-depth analysis of OA principles by the International Federation of Organic Agriculture Movement (IFOAM) and Ethical Principles for Climate Change: Adaptation and Mitigation by World Commission on Ethics of Scientific Knowledge and Technology (COMSET). The aim of the paper is to explore the CC mitigation and adaptation potential of OA on an ethical basis. The paper seeks to trigger research, development, and application of OA and CC mitigation on an ethical basis.

Keywords *Organic Agriculture, Climate Change, Mitigation, Ethics, Principles*

Introduction

Agriculture is both the cause and the victim of Climate Change (CC). Green House Gas (GHG) emissions from all sectors related to agriculture potentially sum up to 25-30% of total GHGemissions (Skinner et al., 2019). Current scientific models predict substantial environmental changes caused by these emissions. It is reported that the forecast increase in global temperature of between 1.4°C and 5.8°C may result in alterations in precipitation patterns (Smith et al.,2014). Extreme weather events like droughts and floods are expected to occur more frequently. CC would have multiple as well as highly varied implications on agriculture in various parts of the globe (Arora, 2019). It could lead to a changed pest profile harming the yields of staple crops. Seasonal variations in weather events may pose risks to traditional methods of crop production either due to water constraints or a surplus of water and erosion. Soil stability may become crucial to store water in the soil profile, resist severe weather events, and minimize soil losses. Vulnerable regions such as tropical and subtropical areas and high mountain regions are expected to suffer most from CC.

With the changing climate, agricultural production in most parts of the world will face unpredictable weather. Therefore, resilience and adaptation of farming practices are of utmost importance. Organic Agriculture(OA) is perceived as a solution to input-intensive industrial agriculture and itsassociated environmental and social impacts. It is claimed to decrease GHG emissions and mitigate CC (Smith et al., 2019). But does it deliver overall advantages over conventional agriculture is however contentious? There are varied scientific claims on organic farming systems being more profitable and environment friendly (Reganold and Wachter 2016) while questioning its role in promoting future sustainable food systems (Connor and Mínguez, 2012).

The Global Warming (GW) potential of OA is claimed to be considerably smaller than that of the conventional system. CH_4 accounts for 14 % of all GHG emissions mainly from agriculture. CH_4 emissions stem largely from ruminants, manure heaps, and rice fields (Beauchemin and Mc Ginn, 2005). These emissions could be controlled by shifting to integrated farming systems utilizing different components along with crops and livestock. In organic farms, the livestock number is limited and is neither extensive nor exclusive. It is reported to reduce CH_4 emissions by aiming towards livestock longevity (Venterea et al., 2012). But in another study by Wagenberg et al. 2017, comparisons of different livestock production were drawn for conventional and organic systems, highlighted lower

productivity in pigs, hens, and dairy cows. Reasons cited for this were the lower use of high-yielding varieties, long rearing periods, and high mortality due to restricted use of medication (Wagenberg et al., 2017).

Synthetic Nitrogen fertilizers are a major contributor to N_2O emissions. Nearly 1.6% of Nitrogen fertilizer applied is emitted as N_2O (Niggli et al., 2008). Energy used for the production of these fertilizers as well as the emission of N_2O from soils after the application of fertilizer alleviates the GHG emissions manifold. In contrast, OA is claimed to be self-sufficient in Nitrogen. Mixed farm practices, highly efficient recycling of manure from livestock and crop residue, and growing legumes as cover crops deliver nitrogen in the soil in sufficient quantities (Barton et al., 2008). Such eco-friendly practices baring the use of mineral nitrogen reduce the concentration of easily available mineral nitrogen and N_2O emissions. Furthermore, soils managed organically are more aerated and have significantly lower mobile nitrogen concentrations (Krause et al., 2017) On long term analysis, 40.2% reduction of N_2O emissions were recorded by Skinner et al. in a recently published comparative study of organic and non-organic systems (Skinner et al., 2019). Ironically, these reductions were estimated per unit area and not per unit yield. It was further reported that, when analyzed on per unit product basis, organic products were found to emit similar or larger GHGs than conventional products, as the lower GHG emissions from avoidance of mineral fertilizers and other inputs were canceled out by the lower yields (Clark and Tilman, 2017).

Annual CO_2 emissions from intensively cropped fields were found to be equivalent to 8% of global industrial emissions. Primary farm practices of OA like inter-cropping, cover cropping, conservation tillage, animal manure and composting, were claimed to aid in carbon sequestration and storage (Gattinger et al., 2012). The application of these improved agricultural practices conserves the soil ecosystem and converts carbon losses into gains (Seufert et al., 2012 and Krauss et al., 2017). Further, as this system restricts the preparation of land by burning vegetation to a minimum it could contribute considerably in reducing deforestation (Wani et al., 2013). In complete contrast Smith et al., 2019 reported that increased soil carbon sequestration in organic farming would indirectly increase GHG emissions as more vigorous conventional farming needs to be practiced elsewhere to provide larger quantities of food to make up for lower organic yields.

OA is diverse in terms of crops, fields, rotations, landscape, and farm practices (Bengston et al., 2006). Such a high level of diversity furnishes as well as enhances many ecological services, thus augmenting farm resilience. Positive effects of enhanced biodiversity have been reported on pest prevention and control (Halberg et al., 2015). Diversified agroecosystems also reduce the incidence of disease outbreaks. But it is important to note that large-scale conversion to OA to compensate for lower yields can lead to loss of natural habitats and hamper biodiversity (Meemken and Qaim, 2018) Further,many studies have also reported that these biodiversity benefits were greatest at field levels while at farm and landscape level may be smaller due to variation in landscapes and practical implementation.

The main challenge for OA is to improve overall sustainability as well as increase yields without causing harm to the environment. The efficiency of OA to achieve it has been criticized on various aspects. Organic farming practices were reported to have positive impacts on the environment per unit of area, but not necessarily per unit product. Organic farms tend to have higher soil organic matter content and lower nutrient losses per unit of a field area. However, ammonia emissions, nitrogen leaching, and nitrous oxide emissions per unit product were higher than organic systems. Organic systems were reported to have lower energy requirements, but higher land use, eutrophication potential, and acidification potential per unit product (Toumisto 2012).

It is important to note that there is wide variation between the impacts withinorganic farming systems on basis of region, farming practices, crops, components, and area. There is not a single organic or conventional farming system, but a range of different systems. Therefore, the level of many environmental

impacts including GHG emissionsis much more complicated to generalize on our current understanding andcomprehension. Interestingly, an important aspect related to OA as reported by Thompson et al., 2018 was that maximum research on OA to date has been done in developed countries, where variability inagricultural yields can be dealt with easily due to their agricultural policies which help buffer the effects of yield volatilityon greater market impacts (Thompson et al., 2018). In contrast,food security is at the greatest risk in less-developed countries, whereminimal researchon OA has been conducted.

Materials and Methods

A huge asymmetrical database has been generated on the sustainability of OA and its potentialto mitigate CC. It has become a contentious issue for the agricultural community and climate scientists around the world. The dynamics of CC and its impacts are complex and highly uncertain. Similarly, OA interacts with the complex ecosystem in a synergistic manner leading to intricate and intertwined effects on the environment. Consequently, it becomes difficult to comprehend the inter-relation of OA and CC by studying their structural changes only. Thus, an assessment of the underlying values and principles of OA and CC mitigation isdrawn here to understand the complexity of their inter-relations.A study of the potential influence of OA on CC mitigation on an ethical basis may initiate a dialogue and develop coherent solutions to feed the warming up world. The following sections analyze principles governing OA and CC mitigation to make a constructive contribution to the ongoing international debate. The ethical principles governing OA by the International Federation of Organic Agriculture Movement (IFOAM, 2005) and Ethical Principles for Climate Change: Adaptation and Mitigationdeveloped by the World Commission on Ethics of Scientific Knowledge and Technology (COMSET, 2013) are examined and investigated for their efficacy individually as well as in conjunction in developing a sustainable ecosystem for benefit of mankind.

Results

1. Ethically Organic

OA is deeply embedded in morals, values, and ethics with intergenerational equity central to it. OA is a system that largely excludes the use of synthetic inputs such as fertilizers, pesticides, hormones, feed additives and to the maximum extent feasible, relies upon crop rotations, crop residues, animal manures, off-farm organic waste, mineral grade rock additives, and biological system of nutrient mobilization and plant protection (Murata et al., 2016). It is based on strong ethical principles and values as delineated bythe International Federation of Organic Agriculture Movement (IFOAM, 2005) as discussed here.

The first principle defines ‘Health’as the wholeness and integrity of living systems. It is not simply the absence of illness, but the maintenance of physical, mental, social, and ecological well-being. As reported,OA enhances the health of the soil, plants, animals, humans, and the entire environment (Lorenz and Lal, 2016). It emulates and sustains ecological systems and cycles. The health of individuals and communities cannot be separated from the health of ecosystems as healthy soils produce healthy crops that foster the health of animals and people. Morally, the role of OA is to improve the health of ecosystems and organisms from the smallest in the soil to human beings.

OA works in close association with nature to build up a cyclic harmony which ensures versatility, diversity, and stability in agriculture as described in the second principle ‘Ecology”. Crop production with the use of alternative sources of nutrients like organic manure instead of fertilizers, biological control and bio-pesticides instead of chemical pesticides, proper crop residue management, and crop rotation are intrinsic to this system (Rundlof et.al., 2010). OA largely depends on the recycling of resources and the use of renewable resources which is in complete harmony with the underlying concepts of ecological sciences.

One of the essential elements of OA is to manage the entire surrounding ecosystem to ensure far-reaching and sustainable benefits to all sections of society. The third principle of ‘Fairness’ ascribes importance to enhance

transparency and co-operation in the food production system by involving and respecting farmers' needs and indigenous knowledge which would result in the inclusive and sustainable growth of the society. It involves better plant protection by following traditional physical, cultural, and biological control methods. This use of experience-based knowledge giving due importance to regional and local interests could make the system self-sufficient and also leads to the development of harmonious cultural and social values (Meemken and Qaim, 2018). It aids in building relationships and ensuring fairness concerning the environment, society, and life opportunities.

Care, the fourth governing principle, states that OA should be managed in a precautionary and responsible manner to protect the health and well-being of current and future generations as well as the environment. OA is a sustainable approach to farming and is strongly rooted in the Precautionary principle as stated in Agenda 21 of the Rio Declaration. This principle holds that lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation (Agenda 21, 1993). In other words, a conservative regulatory and management approach should be taken, in the absence of convincing evidence to the contrary. Therefore, under the fourth principle of Care,OA must work on known, well-functioning, and traditional technologies thanadopting any risky technology to prevent damage than to depend on our ability to cure damage.

These principles have a strong ethical component and displaya much wider view of a good agricultural practice which may serve as a guide to conventionalfarming. However, these valuesare only partially codified in rules and regulations, thus compromising on a holistic vision of OA (Milestad et al., 2008). Indeed, the organic standardstend to focus on values and practices that are easy to codifyand audit through the inspection and certification process,such as what inputs are permitted or excluded. However, notall are translated into production rules that can be part of inspectionand certification. This mostly affects agro-ecological system values such as biodiversity andnutrient recycling, as well as the lack of social considerations. However, the fact that some core values are not part of thestandards does not mean that they are less important.Organic farming practices must not focus exclusively onimplementing the minimum requirements necessary for certification.The goal should be to uphold the impetus to keep developing farmpractices that implement the principles more comprehensively to do justice to the systemic nature of OA.

2. Mitigating Climate Change Ethically

CC has been described as aperfect moral storm because of the three major challenges it poses to any ethical action (Gardiner, 2006). The first challenge is the global impact of CC, as once emitted, GHG emissions lead to long-lasting climatic, social and economic effects anywhere on the planet, regardless of their source. The second challenge is that these carbon emissions have profoundly intergenerational effects. GHG emissions typically persist in the atmosphere for a long time, contributing to negative climate impacts for centuries, or even millennia. The third challenge to ethical action is that existing theoretical tools to mitigate CC are underdeveloped and lack comprehensive discourse on international justice, intergenerational ethics, scientific uncertainty, and human ecology (Barker et al., 2007). Therefore, CC involves serious ethical issues, especially in its global, intergenerational, and ecological dimensions. Despite challenges owing to underdeveloped theories and pragmatic issues, there is an important initial consensus on the global level on the need forserious action based on the relevance of key ethical concernssuch as fairness and responsibility. Efforts have been made to delineate the ethical basis for CC mitigation at the national as well as international level. Most comprehensive documentation of such principles can be drawn out from the "Ethical Principles for Climate Change: Adaptation and Mitigation; Report of COMEST" developed by the World Commission on Ethics of Scientific Knowledge and Technology (COMSET, 2013). The report identifies and discusses in detail the ethical issues on CC mitigation. It presents a comprehensive approach embracing the variety

of worldviews onnature, environment, and CC. Here, an analysis of ethical principles governing CC mitigation is drawn and discussed.

The first principle of 'Biological Diversity' upholds not only the importance of individual species and their unique environments but also emphasizesthe critical distinction and importance of the combination of life forms and their interactions with each other and with the rest of the environment that makes Earth a uniquely habitable place for humans.It lays importance on the equilibrating dynamics between species and systems rather than the mere diversity of organisms and species (COMSET, 2013).It is observed that the systemic nature of CC ethics requires actions that maintain the equilibrium between ecological complexes and strengthens the diversity of relationships between organisms and their ecosystems.

The principle of 'Cultural Diversity'stresses the diverse modes of participation by all nations in CC mitigation and adaptation. It acknowledges various worldviews of nature and allows these worldviews to propose their way of addressing the problems of CC from within their cultural contexts. Many indigenous philosophies give priority to harmonious relationships with nature wherein humans merely conform to the laws of nature (UNESCO, 2010). The principle of cultural diversity gives voice to a more pluralistic framework of worldviews and diversity of practices.Thus, it is established that an ethical approach to the dialogue of cultural traditions will help to clarify the responsibilities of the various stakeholders and make them accountable for their decisions.

CC has implications not only on the past and future generations but also on the life-support systems that make human life possible. The third principle of 'Interdependence' entails that the survival of one species contributes to the survival of others. Therefore, it is the responsibility of humans who benefit most from others that these be allowed to flourish for the sake of their existence and not because they are needed for human utility.The fourth principle of 'Intellectual and Moral Solidarity' of humankind as enshrined in the report calls for global action on CCas it transcends beyond national boundaries, gender, age, and ethnicities (COMSET, 2013). According to this principle, a solid ethical foundation should govern the responsibilities and actions, according to affordability and needs, particularly towards affected individuals and populations, but also more broadly towards the environment and future generations.

Global Justice for humans as well as non-human creatures on Earth is vital for the sustenance of life on earth. The fifth principle of 'Global Justice' concerning CC requires the participation of all members of human society regardless of their contribution to the problem. The effects of CC are not only experienced by those who happen to be situated in hazardous locations in the world but can also be a burden to other nations when the climate refugees and migrants engendered by this phenomenon, begin to demand their human rights and the right to live together as citizens of the world. It is therefore of mutual benefit to all humankind to address this common problem not only to maintain a healthy equilibrium among people and their environments but also to promote the other benefitsof a healthy environment including a well-balanced economy and political arrangements (Jamieson, 2014).

Resilience is associated with the development of strategies that promote procedures and systems that lead communities toresolve climate-related disasters through self-organization and feedback mechanisms at various levels of society. The sixth Principle of 'Resilience' includes the use of traditional and indigenous knowledge and experience of past natural or technological catastrophes.It measures the ability of individuals and local communities to fight back from the catastrophic effects of CC and to be able to reduce the risk and damage to life and infrastructure in the future (UNESC0, 2010). This principle calls for an all-inclusive approach to develop strategies to mitigate and adapt to varied impacts of CC utilizing both traditional and technological advancements which reach out to the most vulnerable sections of the society. These strategies must effectively respond to the environmental and humanitarian crises caused by CC.

'Frugality' the seventh principle givesa practical approach to balance the levels of

consumption and production so that wastes are reduced to a minimum while the extraction of resources is limited to the replenishing capacity of nature. Ecological footprints should be reduced so that ecological niches are not extended beyond their carrying capacities. Technological innovations that follow the principle of frugality induce proportionality between the production costs and the financial capacity of consumers. Under this principle, a discernment of the distinctions between needs and wants is called for, so as wants are simplified so that others may live simply according to their needs.

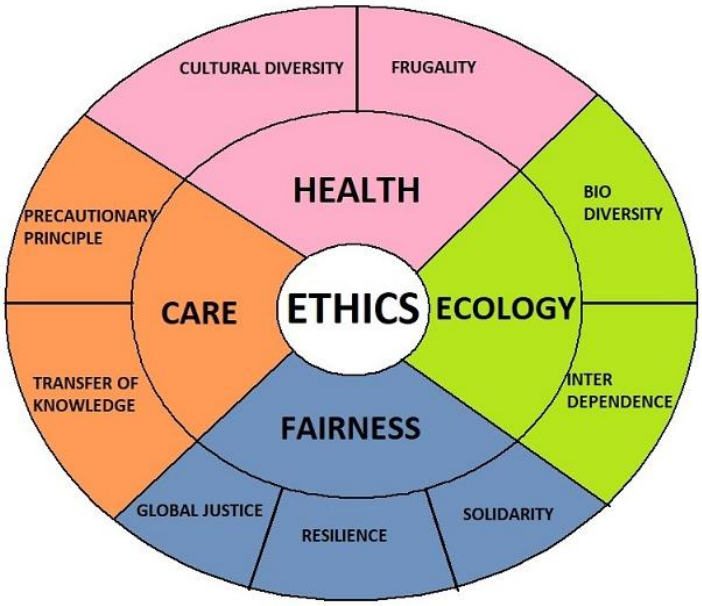
The eighth 'Precautionary Principle' suggests that theuncertainty in knowledge and understanding of impacts of CC cannot be an excuse to ignore the possible risks It is important to understand that this principledoes not suppress innovation or hamper scientific progressbut it may imposea no-go or a go-slowon certain directions of innovation and scientific progress, but at the same time it acts as a stimulant for other innovative alternatives and clean technological progress (Gardiner, 2006).

The transfer of scientific knowledge and technology is essential for vulnerable populations who are exposed to similar risks and threats can have access to, share, and aggregate their best practices on CC adaptation and mitigation. The dissemination of scientific information among the vulnerable groups, therefore, is a matter of human rights in terms of enhancing not only the material conditions of existence but also of the intellectual and indivisible heritage of humankind. The report under the ninth principle of 'Integrity of Scientific Communication'recognizes certain issues considering the integrity of scientific research and equal access to an adequate scientific knowledge base, risk assessment, and the integrity of climate science (COMSET, 2013). Science does not provide certainty, but it does provide the consensus of experts, based on the organized accumulation and scrutiny of evidence. The discussion of ethical principles governing CC mitigation imposes a moral obligation on scientists, policymakers, governments, and mankind, in general, to rectify and apply these inhuman activities and processes. These principles when imbibed in general practice may go a long way in mitigating CC by sustaining various life processes on Earth.

Discussion

A comparative analysis of principles governing OA and CC mitigation, so drawn depicted unison at many points. These ethics are primarily based on the ecological principle of the harmonious existence of all beings on Earth. It is the unifying theme that accords utmost importance to various ecological processes which support all life on Earth. It is necessary to maintain these ecological processes in the changing climate and environment as delineated in the IFOAM principle of ecology. It completely resonates with the principles of Biological Diversity and Interdependence of life on Earth as given in the 1st and 3rd principles on CC mitigation in the COMSET report. Ecological resistance is the core of CC mitigation and adaptation. It enhances the ability of the ecosystem to cope with any disturbance. Both OA and CC mitigation exploit the dynamic interlinking of various ecological processes (See figure 1). Maintaining the health of ecosystems is integral to the concept of OA. CC mitigation principles Frugality and Cultural diversity also reaffirm the importance of maintaining ecological processes by adopting a judicious approach to the use of resources by integrating the indigenous practices.

Fig. I Inter-relation of IFOAM principles (the inner circle) and COMSET principles (outer circle) on OA and CC mitigation respectively



The application of these principles relies heavily on the fairness component. These principles on CC mitigation and OA should be adopted in totality,extending to all the sections of society especially the most vulnerable. It calls for global, gender-sensitive, and intergenerational equity at every step as ascribed in the IFOAM and COMSET principles.Human activities, efforts, and policiesshould heavily draw from these principles and direct the activities accordingly. These natural systems should be conserved by adopting a precautionary approach to the development of new technologies and sharing the scientific and technological know-how as delineated in the OA as well as CC mitigation principles. OA and CC mitigation ethically appears to be the most viable approach to balance the ever-rising food demand with global warming and could boost the capacity of agricultural production in the changing climate as well as to adapt to it (Willer and Lernoud, 2018). The above synthesis highlights that, OA reduces the industrial approach to farming, integrating it with eco-friendly methods which are of great benefit in mitigating CC. It represents a clear advantage for CC mitigation and adaptation and works in complete rapport with CC response strategies.

Thus, it is imperative to take steps and make decisions in the face of uncertainty which in turn give rise to specific burdens of responsibility, which are inherently ethical in nature making them integral to the functionality in farming and mitigation practices (Krauss et.al., 2017). Governments around the globe need to rethink and reframe their agricultural policies for OA to sustain the global food supply as well as agro-ecosystems. OA can serve as a benchmark for allocating development resources to measure progress in implementing climate-related multilateral environmental agreements (Das et. al., 2020). A pragmatic shift in agricultural research is called for, where OA is given more precedence over biotechnological mania. Governments must allocate funds to researchers in this field with special schemes and awards for path-breaking outcomes. Authentic certification of organic produce is necessary which will help in creating awareness and a market for these products. Subsidies on biopesticides, biofertilizers, and other eco-friendly farm products should be given to motivate farmers. OA represents farmers' ability to adapt to predictable and unpredictable impacts of CC and also helps to mitigate CC. Thus, it should be included in UN-REDD (reducing emissions from deforestation and forest degradation) program, to create an incentive for developing countries to protect, better manage, and wisely use their forest resources, contributing to the global fight against CC (Ji and Ranjan, 2019). It is recommended that organic farmers should be made eligible for Certified Emission Reduction (CER) units issued by Clean Development Mechanism (CDM) with the substantial mitigation and adaptation potential OA presents. The need of the hour is to highlight and promote OA as a low-cost,

high benefit GHG emission reduction system globally. With its holistic multi-target approach and CC response strategies, OA is the way forward for the benefit of mankind. It opens a window of hope and possibilities in creating an ecologically, economically, and socially sustainable world.

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EFFECT OF CIRCUIT TRAINING AND INTERVAL TRAINING ON FLEXIBILITY AMONG INTER-COLLEGIATE MALE CRICKET PLAYERS

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ABSTRACT

The purpose of this study was to explore the effect of circuit training and interval training on flexibility among inter-collegiate male cricket players. To achieve this purpose of the study, forty five inter-collegiate male cricket players from Govt. degree college killam UT Jammu and Kashmir were selected subjects at randomly and their age was ranged from 18 to 23 years. The subjects were divided into three equal groups namely circuit training group, interval training group and control group of 15 subjects each. Group I- underwent circuit training group, Group II- underwent interval training group and Group III- underwent control group who did not participate in any specific training programme apart from their normal routine. Flexibility was taken as variable for this study and was measured by sit and reach test respectively. The collected data is analyzed using analysis of covariance (ANCOVA) was applied. When the 'F' ratio of adjusted post test mean was found to be significant, then scheffe's post hoc test was applied to find out the paired mean differences. In all cases, 0.05 level of confidence was fixed to test the significance. The result of this study revealed that there was a significant difference among circuit training group and interval training group as compared to control group. However, circuit training was found to be better improvement than interval training in flexibility among inter-collegiate male cricket players.

Keywords: *flexibility, circuit training and interval training*

Introduction

Cricket is a field-based popular team game in most countries. It is a most common game, particularly in India, which is a bat and ball game played on a field between two teams of 11 players, at the centre which is a rectangular 22-yard-long pitch. Though cricket is one of the oldest organized sports, there is very little research on the game's physical requirements (Woolmer, B., & Noakes, T. D. 2008).Cricket is a popular team game in most commonwealth countries. In past it was played solely in a specific season. But it is popularity has gained tremendous momentum since last three decades and now it is played throughout the year. The cricketers are exposed to more demanding schedules, with longer period of time for training and practicing (Davies et at., 2008). In cricket, muscle strength and flexibility are known as important factors that determine an athlete's physical condition as it is required for bating, balling, throwing purposes. Handgrip strength is characterized as the strength and force of the muscles they can create with their hands. The forceful flexion of all finger joints, thumbs, wrists with full voluntary force is the result of which the subject is able to exercise under normal bio-kinetic conditions.(Gabor, A. 2003).

Circuit training in cricket is a simple method of giving a player a variety of exercises that will improve the three main functions relating to his performance on the field. These are strength, endurance and mobility. Circuit training suits the cricketers very well in that it is realistic and enables the player to keep within his physical capabilities(Ashok Kumar1999).Motor fitness is gauged by performance and this performance is based on a composite of many factors. The most commonly mentioned fitness factors are strength, endurance, power, speed, coordinative ability, balance, flexibility. Some of these factors evidently are more dominant than others and thus have a higher relationship with motor fitness(Singh, et, al 2003).Physical fitness encompasses human physical abilities such as body compositionand coordination, cardiovascular capacity, stamina, speed, flexibility and overall strength. Physical fitness prevents the occurrence of a variety of diseases. It develops a capacity tofight infections and certain other diseases. Physical fitness helps prevent many of the major cardiovascular diseases **(**Lifshitz, et.al, 2014)
Maintaining postural control is a key element of performing most physical movements. While flexibility is an important contributor to

sports performance, the fact that less flexibility has the potential to cause injury is supported by Hrysomallis (2009)who investigated the relationship between flexibility and injury to hip adductors. The results of this study indicate that flexibility is a parameter that can affect the risk of injury. Adequate strength throughout the body is effective in preventing potential injury, muscles with greater strength and joints with greater integrity are less prone to injury. To ensure a better quality of life and optimum success in professional sports, an acceptable degree of versatility is required. In certain sports requirements, flexibility is now recognized as a valuable part of an athlete's physical fitness program for the purpose of injury prevention, improved and successful results, or quicker and safer recovery, regardless of achieving great flexibility as a fundamental motor ability.(Herbert RD, Gabriel M. 2002)

Various methods of training components of physical conditions are common in the sports, including: repetition training, interval training, continuous training, circuit training. Among the diversity of forms of training methods, the circuit training method shows the diversity of forms of exercise because it can combine or package forms of exercise for all components of physical fitness, circuit training alone is aseries consisting of a number of different posts in which individuals perform a given exercise as much as possible. Over a period of time, Circuit training is designed to develop cardiovascular endurance as well as muscle strength, flexibility and endurance in important muscle groups, it is an efficient training method in terms of gains made in a short period of time (Reddy, 2012:)

Methodology

To attain the purpose of the study forty five (45) inter-collegiate male cricket players have been randomly selected from Govt. degree college killum (UT) Jammu and Kashmir. The age of the subject were ranged from 18 to 23 years. The selected subjects were medically examined by a qualified physician and certified that they were medically and physically fit enough to undergo the training programme. The subjects were randomly divided into 3 equal groups. Containing fifteen in each group, Group I was given circuit training, Group II was given interval training and Group III was control group. Among both the groups underwent training conduct for twelve weeks (3) days per week. Flexibility was measured by Sit and Reach test with record of centimeters.

Training program

The experimental each training group consisted of 45 to 60 minutes sessions divided into five stages, warm-up (5 to 10 minutes), specific training (30 to 40 minutes), warm- down (5 to 10 minutes) and stretching (5 minutes). Circuit Training method that involves stirring from one exercise to another, each exercise working a different muscle group until each muscle has been worked. Interval training involves alternating high intensity exercise with recovery periods and there are a variety of ways to set up interval workouts.

Experimental Design and Statistical Technique

The experimental design in this study was random group design involving 45 subjects, who were divided at random into three groups of fifteen each. All the subjects of three groups were tested on dependent variables prior to and immediately after the training programme. The analysis of covariance (ANCOVA) was used to analyze the significant difference, if any among the groups. Since, three groups were compared, whenever the obtained 'F' ratio for adjusted post- test was found to be significant, the Scheffe's post hoc test was applied to find out the paired mean differences, if any. The .05 level of confidence was fixed as the level of significance to test the 'F' ratio obtained by the analysis of covariance, which was considered as appropriate and the results are presented below.

Analysis of flexibility

The statistical (descriptive) analysis showing mean, percentage of improvement and't' ratio of the collected data on flexibility of two experimental groups and control group are presented in the table I.

Table –I: Descriptive Analysis of the data on flexibility

Variable	Groups	Pre-Test Mean	Post-Test Mean	MD	%	't' ratio
Flexibility	Circuit Training Group	18.45	24.88	6.43	34.85	27.78*
	Interval training Group	18.18	22.88	4.70	25.85	16.39*
	Control Group	18.32	18.38	0.06	0.32	0.22

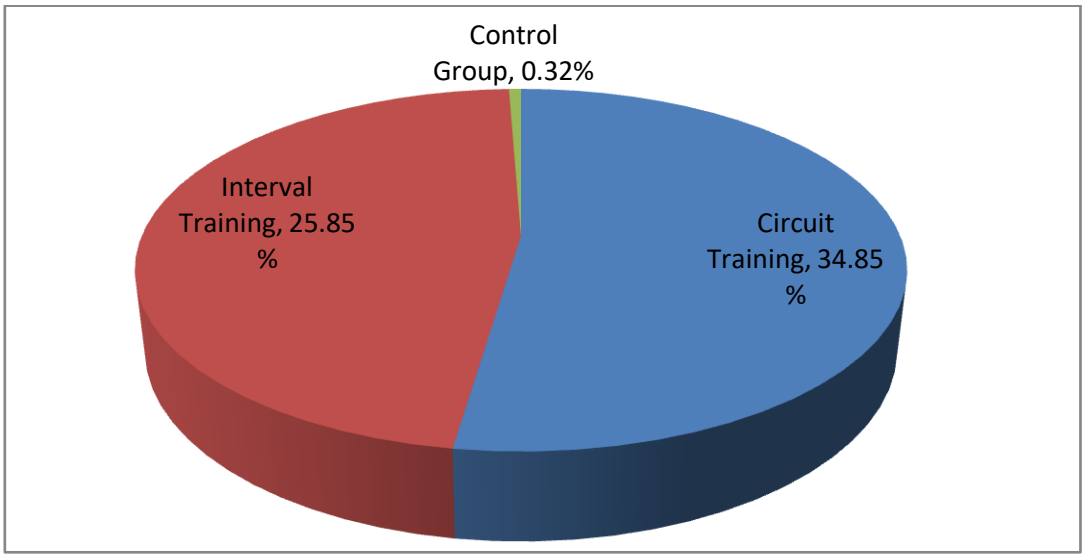
**Significant at 0.05 level for the df of 1 and 14 is 2.15*

It is clear from the table - I, that there were significant differences between pre-test and post-test data on flexibility of circuit training group , interval training group and control group because obtained 't' ratio of 27.78 and 16.39 are greater than the required table value of 2.15 at 0.05 level of significance for the df of 1 and 14. However, insignificant difference was found among pre and post test of control group, as obtained' 0.22 is lesser than the required table value of 2.15 at 0.05 level of significance for the df of 1 and 14.

The results of the study also produced 34.85 % of changes in flexibility due to circuit training, 25.85 % of changes due to interval training and 0.32 % of changes in control group.

The percentage of changes on flexibility of circuit training group, interval training group and control group are given in the figure I.

Figure – I: Pie Diagram Showing the Percentage of Changes on flexibility



The data collected from the three groups on flexibility was statistically analyzed by ANCOVA and the results are presented in the table II.

Table – II: Analysis of Covariance on flexibility of Experimental and Control Groups

Test	CTG	ITG	CG	SoV	SS	DF	MS	F
Pre test Mean	18.45	18.18	18.32	BG	0.544	2	0.272	0.38
SD (±)	0.75	0.88	0.88	WG	29.823	42	0.710	
Post-test Mean	24.88	22.88	18.38	BG	332.877	2	166.438	233.23*
SD (±)	0.89	0.70	0.91	WG	29.972	42	0.714	
Adjusted Post-test Mean	24.84	22.92	18.38	BG	330.085	2	165.042	247.10*
				WG	27.384	41	0.668	

**Significant, Table value, 2 to 42 & 2 to 41 is 3.22 & 3.23*

Table - II shows that pre-test mean values on flexibility of circuit training group, interval training group and control group are 18.45, 18.18 and 18.32 respectively. The obtained 'F' ratio of 0.38 pre-test score was lesser than the required table value of 3.22 for df 2 and 42 for significance at 0.05 level of confidence on flexibility. The post-test mean values on flexibility of circuit training group, interval training group and control group are 24.88, 22.88 and 18.38 respectively. The obtained 'F' ratio value of 233.23 for post-test score was greater than the required table value of 3.22 for the df of 2 and 42 for significance at 0.05 level of confidence on flexibility.

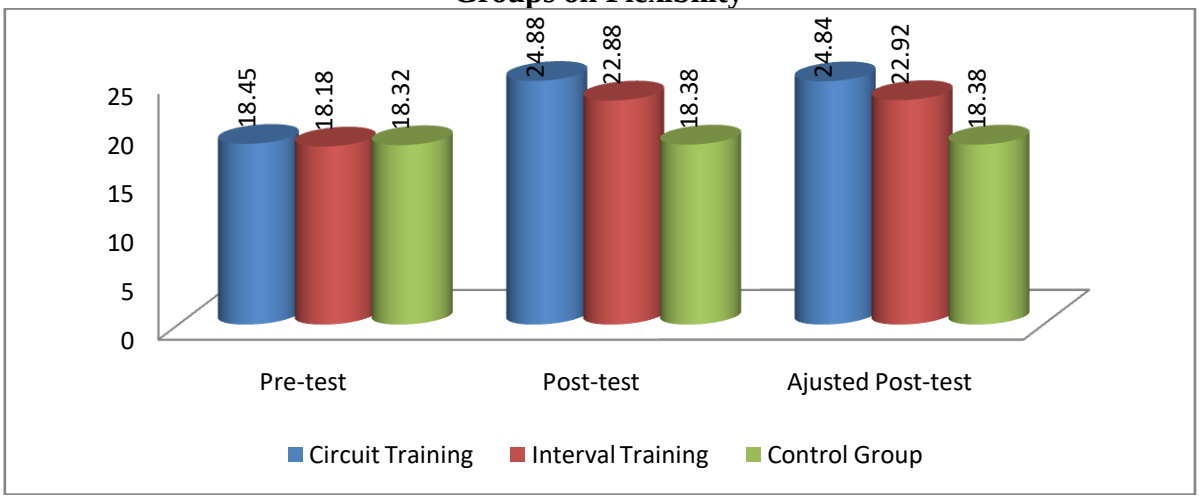
The adjusted post-test means of circuit training group, interval training group and control group are 24.84, 22.92 and 18.38 respectively. The obtained 'F' ratio value of 247.10 for adjusted post-test score was greater than the required table value of 3.23 for df 2 and 41 for the significance at 0.05 level of confidence on flexibility. It was concluded that differences subsist among the adjusted post-test means of circuit training group, interval training group and control group on flexibility. The 'F' value in the adjusted post-test means was found significant, hence the Scheffe's test was applied to assess the paired mean difference and the results are presented in table - III.

Table – III: Scheffe's Test for the Differences between Paired Means on flexibility

Circuit Training Group	Interval Training Group	Control Group	MD	C I
24.84	22.92		1.92*	0.76
24.84		18.38	6.46*	
	22.92	18.38	4.54*	

From table – III, the scheffe's post hoc analysis proved that significant mean differences existed between circuit and interval training groups; circuit training and control groups; and interval training and control groups on flexibility. Since, the mean differences 1.92, 6.46 and 4.54 are higher than the confidence interval value 0.76 at 0.05 level of significance. From the above table, it was imperative that both the experimental groups differed significantly from control group on flexibility. Significant differences were found between circuit training group and interval training group in improving flexibility of inter-collegiate male cricket players. Therefore, twelve weeks of circuit training showed greater improvement than interval training on flexibility among inter-collegiate male cricket players. The findings of the study implies that both the groups improved, but circuit training was significantly better in improving flexibility among inter-collegiate male cricket players than other groups confined to this study. The changes in flexibility among inter-collegiate male cricket players are presented in figure II.

Figure –II: The Pre, Post and Adjusted Post Test Means of Experimental and Control Groups on Flexibility



Discussion on findings

The result of the study indicated that the experimental groups namely circuit training and interval training had a significant influence on flexibility among inter-collegiate male cricket players. Also circuit training is better than interval training on flexibility among inter-collegiate male cricket players. The results of the present study were supported by many research findings, (Vairavasundaram et al, 2014) showed that significant improvement in all the selected physical variables namely agility, explosive power, muscular strength endurance and flexibility among handball players. (Kumar, R. A., & Kumar, S. R, 2019) field training with and without yogic practice group had shown significant improvement in all the selected physical fitness variables among Cricket players. However, the significant difference was observed only on flexibility Cricket playing ability. Sathianarayanamoorthi, (2013) results of the study showed that there was significant level differences exist between game-specific field training groupgame-specific field training with mental practice strategies group showed significant improvement on level of speed, explosive strength, flexibility, achievement motivation, aggression and anxiety as compared to control.

Conclusion

It was concluded that circuit training and interval training group had significant improvement on flexibility as compared to control group. However, the result of the study also reveals that increase in flexibility significantly more for circuit training group as compared to interval training group among inter-collegiate male cricket players.

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FACTORS INFLUEINCING E-TAILING AMONG RURAL WOMEN: IN CASE OF SRIKAKULAM DISTRICT

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ABSTRACT

Rural adroit are quite stimulating in India for its characteristics integrated with size and nature. Marketing efforts have been innumerable to motivate rural women and previous researches explored the difficulties associated with the exceptional strategies. Stepping a head the study of online shopping at rural places which has been tremendously increased in the recent pandemic time and there is gap of research associated with rural women in specific. This study aimed to assess the factors influencing the awareness of online shopping at rural places in Srikakulam District. The method mix used in this study was descriptive design, mixed approach, primary and secondary data collection, convenience sampling of non-probability technique, cross sectional research with multi stage sampling and analytical statistics. The outcomes of the research at the stand point of independent variables i.e. Promotions, Availability, Product education & demonstrations, Lifestyle, Acceptability and Affordability have been explored with its weight to explain the awareness of online shopping. Deliberations amalgamated with management implications have been offered on the basis of results.

Keywords: *Rural Marketing, Rural women, online shopping, Srikakulam District.*

Background Of The Study

Consumer being influenced by innumerable marketing efforts amalgamated with mixture of ingredients has been continuously changing his decision with respect to every minute change comes across the way. Not an excuse to rural market which is considered to be the heart of India for its size is vast and most of the marketers focus to grab lion's share from rural India (Koppala Venugopalet,al., 2020).

The dream brains of the marketers in the world as a whole pioneering to tap this growing rural market. Differentiations in geography and demography are quite ostensible which requires distinguished and exceptional strategies at par with the nature and characteristics of any rural consumer. The abrupt trap of women in urban by many marketers has been successfully continuing but contrarily rural women where most number are dogmatic enough and the changes in their socio economic life style is slower enough are the route causes and the marketers have yet to find out effective strategies to attract them (Ranganadh N. S., Venugopal, K., 2020).

To grab the rural market in general and women in specific, marketers must follow certain mandatories related to their environmental conditions. Rural women being occupied with habituated work, confined entertainment regular activities, caring family and managing house, has a little time to be selective extensively at the stand point of quality, brand image and product information yet we can identify a gradual change in their life style (Sainy, B., 2014)..

Especially in the pandemic situation, mostare habituated to health care practices and online shopping. Awareness about company, product, brand, online mobile application, website, order processing and logistics is the basic reason for the participation of women in selling process which is walking like a snail (R. Sureshkumar, 2017),.

The established products for rural markets like tea, soaps, detergents, blades, scooters, motor cycles which have are bought through traditional process at physical shopping where most of the women are confined and satisfied. The recent days there have been many stimulations by marketing efforts have made the rural women talking and chatting about newness of the product. Nevertheless the accessibility, acceptance, ambiguity, affordability and availability are the basic factors influencing the flow of online shopping ay rural places (Iwarsson, S. & Stahl, A., 2003). On the other hand women generally has less possibilities to possess an android mobile more of the time she has got to operate is another vital cause experienced in many research findings.

With the slow pace of increase in women online at rural place the product strategies to be

formulated as per research studies are modifying the product as utility oriented , avoiding sophisticated packaging application of value engineering. Rural women is described to exhibit differentiated regional favorites with typical consumption patterns behavioral personalities at which the marketers have to look at and make strategies (Venugopal, K.et al., 2013).

The study associated to serve the purpose of marketers by attracting the rural women by endeavoring the efforts of certain benefits and how the factors influencing either positively or negatively towards to promote online shopping to rural women which is a core benefit to the total industry as a whole. The study went through the rural areas of Srikakulam District which has high density of rurality.

Objectives

1. To identify problems and prospects of creating awareness on online shopping at rural places in Srikakulam district
2. To assess the factors of Promotions, Availability, Product education & demonstrations, Lifestyle, Acceptability, Affordability.
3. To offer the strategic tools to attract rural women towards online shopping

Hypotheses:

H01: Promotion Mix of E-shoppers has no influence on the level of awareness among rural women

H02: Education and demonstration of E-shoppers has no influence on the level of awareness among rural women

H03: Accessibility has no influence on the level of awareness among rural women

H04: Acceptability has no influence on the level of awareness among rural women

H05: Affordability has no influence on the level of awareness among rural women

H06: Lifestyle has no influence on the level of awareness among rural women

H07: Dogmatic behaviour has no influence on the level of awareness among rural women

H08: Trust has no influence on the level of awareness among rural women

Literature Review

According to Iwarsson, S. and Stahl, A., (2003) the accessibility as synonym of approach attainability tend to be expressed as user friendly to the study area if rural women where the accessibility problem is well expressed with environment relationship which is not supportive to reach.

Trust as an attitude towards purchase behaviour from e- shoppers, we can take the conclusions of Jarvenpaa et al (2000) where the attitude and risk perception relates to the intention as well as trust.When the risk is felt reduced the trust is increased. According to R Suresh Kumar (2017) privacy and security of individual information as the main factors and ambiguous product quality, influence the increase of trust on online shopping by rural women.

Financial transactions with uncertainty also create low level of trust which decreases the intention of awareness among rural women as reported by a research study in Nigeria Ugonna et al (2017)

Dogmatism as personality variable used as a factor in many research studies and it is suggested that the customers with severe dogmatism choose traditional long standing products as well as methods of buying rather than any other innovative modes such as the derivatives of internet marketing (Reisenwitz & Cutler, 1998).

Rural people are said to be naturally traditional and seems to be close minded and rigid while accepting the transition. Something they want to buy will mostly brief preferred through physical shopping and quite uninterested to listen, speak, talk, and touch about online shopping which is out of their traditional peripherals (Lambert & Durand 1997)

Innovative and easy practices of purchasing different goods may increase the comfort but quite contrary to the level of acceptance by rural people due to several reasons such as traditional mindset, low rate of education, habituation, value consciousness, pricing factors and product quality (Accenture research report, 2013)

Affordability in terms of paying total amount at a stretch especially for durable goods is not possible for rural people and as a dominant person of rural families, women take the decision of buying clothes , house hold items and other durable products through credit which is mandatorily offered by rural marketers (Koppala Venugopal et al , 2021).

Though there have been many payment feasibilities such as debit card, credit card, UPI, COD and also installments the risk of paying exact date of every month is considered to be vital factor which cannot be affordable by rural women (Raj, S. J.M., &Selvaraj, P 2007). Moreover most of the rural women are habituated to the usage of sachet packing with high assortments and low risk especially for all FMCG products which may not be possible to serve the same through online shopping (Kasyap. P, 2012).

Awareness is a big problem for a rural women at the stand point of marketing communications through exceptional product mix offers (Kalopra, A 2013). Since the promotional activities are the stimuli to boost the purchase intention with an orientation of economic benefit for short term, most of the marketers endeavor to influence rural women with most of the sales promotional offers at physical shopping. But the same exceptionality may not be continued through online shopping (K Venugopal, 2019)

Conceptual Framework

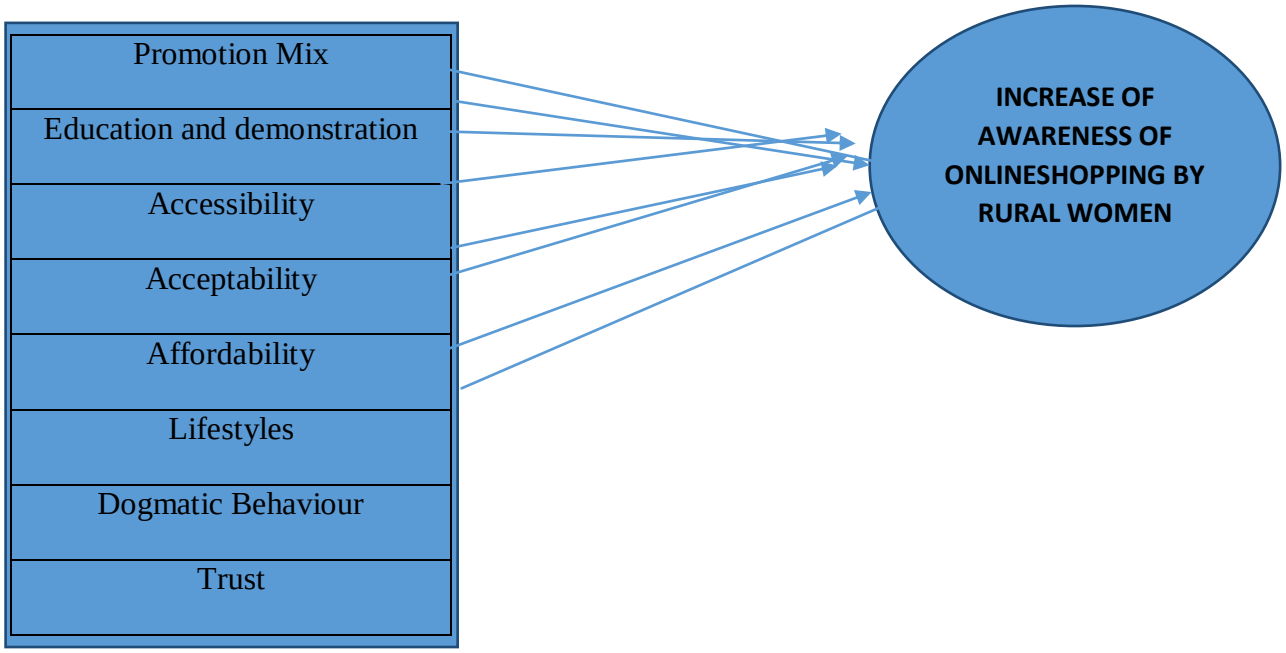

Fig.1 – conceptual framework

Methodology

The study was carried out with deceptive design to analyse the dimensions with a mixed approach of qualitative and quantitative methods. Data was gathered through primary sources such as questionnaire, interview and observation and secondary sources of journals and documents. The questionnaire was self-administered and qualified the standardization of validity and reliability measurements.

Non probability sample of convenience techniques was taken up since the accessibility of infinite population was challenging enough. The R^2 adjusted value is also not different from the previous value as the calculation is taken from Hair et al. (2013), which is a pioneer in this method.

$$R^2_{adj} = 1 - (1 - R^2)\frac{n-1}{n-k-1}$$

Where

R^2adj = Adjusted R^2

N= sample size

K= number of exogenous variables

Accordingly, the result of Adjusted R2 for this model is 0.394091. Sample size is 245, independent variables are eight and coefficient of determination value was 64%.

As part of cross sectional research, the was gathered with multi stage sampling which has been analysed and interpreted ANOVA and Multiple regression analysis were carried out to know the significance and the impact of factors weight on dependent variable by using SPSS 24 and AMOS.

Analysis And Interpretation

Constructs	Sample Mean	Standard Deviation	T Statistics
Promotion Mix -> Level Of Awareness	-0.0886	0.0419	2.0923
Education and demonstration -> Level Of Awareness	-0.0096	0.0456	0.2225
Accessibility -> Level Of Awareness	0.2927	0.0487	5.8411
Acceptability -> Level Of Awareness	0.3038	0.0571	5.2183
Affordability -> Level Of Awareness	0.262	0.0574	4.5398
Lifestyle -> Level Of Awareness	-0.1098	0.0438	2.4996
Dogmatic behaviour -> Level Of Awareness	-0.0912	0.0439	2.0011
Trust -> Level Of Awareness	0.5555	0.0569	9.8501

Table.1 - t-Value of the Constructs

Table 5.1 Shows the t-values of all constructs where the values above 1.68 are significant at 1% confidence interval. Hence, it can be understood that the constructs carries with their values are "Promotion Mix" with2.0923;"Education and demonstration" with 0.2225; "Accessibility" with 5.8411; " Acceptability"with 5.2183; "Affordability" with4.5398; " Lifestyles" with2.4996; "Dogmatic Behaviour" with 2.0011 and " Trust" with9.8501. The values tell us the statistical significance of the research model.As we have seen in the table above, seven out of the eight hypothesis results are statistically significant. The Education and demonstration has been found statistically insignificant and the rest are significant.

The evaluation criteria for confirming each hypothesis was t-values for each path loading. Significant t-values for path loadings signify support for the proposed Path Mean STD Deviation, T-Statistic hypothesis. The cut-off criteria used was a t-value greater or equal to 1.645 for an alpha level of 0.1 (Hair et al. 2006). The detail value is presented here as follows

Constructs	t-Value	p-Value
Promotion Mix -> Level Of Awareness	2.0923	0.007
Education and demonstration -> Level Of Awareness	0.2225	0.412
Accessibility -> Level Of Awareness	5.8411	0.000
Acceptability -> Level Of Awareness	5.2183	0.000
Affordability -> Level Of Awareness	4.5398	0.000
Lifestyle -> Level Of Awareness	2.4996	0.006
Dogmatic behaviour -> Level Of Awareness	2.0011	0.003
Trust -> Level Of Awareness	9.8501	0.000

Table .2 -Significance Value

Seven of the eight hypotheses that have been drawn from the literature found to be statistically significant. One hypothesis i.e. "Education and demonstration" is not statistically significant to affect the level of awareness.

Awareness level has been found to be affectedby Promotion Mix, Accessibility, Acceptability, Affordability, Lifestyles, Dogmatic Behaviour, and Trust with their p-values of 0.007, 0.000, 0.000, 0.000, 0.006, 0.003 and 0.000 respectively which are significant. Hence the hypothesis can be tested as follows

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Hypotheses	p-value	Result
H01: Promotion Mix of E-shoppers has no influence on the level of awareness among rural women	0.007	ACCEPTED
H02: Education and demonstration of E-shoppers has no influence on the level of awareness among rural women	0.412	FAILED TO ACCEPT
H03: Accessibility has no influence on the level of awareness among rural women	0.000	ACCEPTED
H04: Acceptability has no influence on the level of awareness among rural women	0.000	ACCEPTED
H05: Affordability has no influence on the level of awareness among rural women	0.000	ACCEPTED
H06: Lifestyle has no influence on the level of awareness among rural women	0.006	ACCEPTED
H07: Dogmatic behaviour has no influence on the level of awareness among rural women	0.003	ACCEPTED
H08: Trust has no influence on the level of awareness among rural women	0.000	ACCEPTED

Table .3- Hypotheses Result

Recommendations

1. Promotion mix offers such as tiny compliments of free samples, free offers, price tags, discounts and gifts are always attractive which show that there will be a gain of attention by rural women, hence the online shoppers should focus on the so called traditional offers can also be surpassed through online shopping which would make rural women benefited economically.

2. Surprising to note that the education and demonstration for online shopping seems to be rejected by rural women since the value is insignificant. This could be possible with any android electronic device which in fact is not at all used by most of the rural women who generally dominate in taking buying decisions as far as the things to be bought for the hoe is concerned. Most of the rural women are engaged with televisions by watching serials and reality shows who keep themselves away from cell phones thereby online shopping as well. Companies, stepping ahead has to plan to get the rural women attracted to android cell phones firstly, then the online shopping may be served.

3. Accessibility at the standpoint of work schedule and engagement with mobile at the first rate to be analysed and evaluated. On the other hand, the habituated shopping at shandies and village markets make not to shift to any other mode since it is considered as hedonic needs served by them. 4. Technical access measured with respect to the usage of mobile phones, network coverage, internet capacity etc. are to be focused by the marketers to gain the flow of online shopping.

Acceptability as on another element which has high impact on the awareness as to note as a general phenomenon of hesitant behaviour of rural women. Anything against to the things, actions accustomed by them are not acceptable at all. Marketers should make certain strategies to have socialization with them first, thereby capturing the market only by serving better than their traditional practices of buying.

Affordability is a major problem when it comes to buy certain durable goods which cost high price so as it is offered through credit system at most of the rural places moreover women are highly accustomed to buy anything either through credit process or through exchange process at rural and tribal places. The financial feasibilities and transaction facilities should be educated to them very clear since the examples of deceptive transactions are widespread.

Life style as a shade of their work life and walk of life resembles the buying activity also. To be specific to rural women most of them are associated with agriculture or labour work. They mostly considered cellphone as a communication tool most of them are confined to physical shopping. All the above limitations of their life styles are the root causes for there are not aware of online shopping and its benefits. Marketers should try to sell certain products that are highly connected their life styles instead of changing their attitude abruptly.

Though there has been urban transition in terms of infrastructure and technology which facilitate and comforts the rural people. Nevertheless the traditional practices such as ceremonials, agricultural and religious aspects are still alive. Such conventional attitude at intensive rural places creates a kind of dogmatism towards the new practices which is considered to be harmful for rural people.

Trust as major independent variable among rural women, is significant enough to be increased for any buying process. Trust associated with high security, high privacy and product quality should be promised and well served with devotion by all the marketers with continues service and promotions.

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'TELEMEDICINE TO e-MEDICINE'-A PILOT STUDY ON DIGITIZATION OF HEALTHCARE SERVICES IN INDIA

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ABSTRACT

Health has always been the topic of interest and discussion. Recent pandemic has turned the world upside down and everyone were seeking help of healthcare in one way or the other. By considering the same the study focuses on the emerging digitized healthcare services and their deliverables. The study tries to find the factors influencing the digitized healthcare services. A theoretical model is developed by the same, the model has been validated and the reliability of the same has been proved via confirmatory factor analysis. In the main paper, the implications and results of the study are discussed.

Keywords: *Digitization of healthcare, Exploratory factor analysis, Confirmatory factor analysis*

Introduction:

COVID19 tried to turn our world upside down, but the digitization and its stronger roots has uplifted humanity from the insanity. Though the loss is huge but its impact is smoothed by the entire digital scenario. Healthcare domain is not an exception for the same. India's National digital blue print paved way for the amalgamation of informatics with healthcare(1)

Review of Literature:

Extension of healthcare especially at remote areas has been norm since Telemedicine. As the remote areas are inaccessible the modern technology like tele services, digital and internet services are to the rescue for continuation of healthcare (Hirve S ,2019).There are many factors which can contribute to digitization of healthcare services (Eysenbach, G. 2008).Factors like access to internet, reachability, digital literacy,reliability and accessibility play a major role in digitization of health.(Gagnon, K,2015).Simple infrastructural issues likeavailability of power,cell signal also play a pivotal role in digitization of healthcare.(R. Kohli,2016)

Research Methodology:

a.Theoretical Model:

The review of literature gave the following model.Here the independent variables like 'availability of infrastructure', 'digital literacy', 'surprise element' and 'ease of access'.A theoretical model has been framed using the same and it is depicted in the figure1.

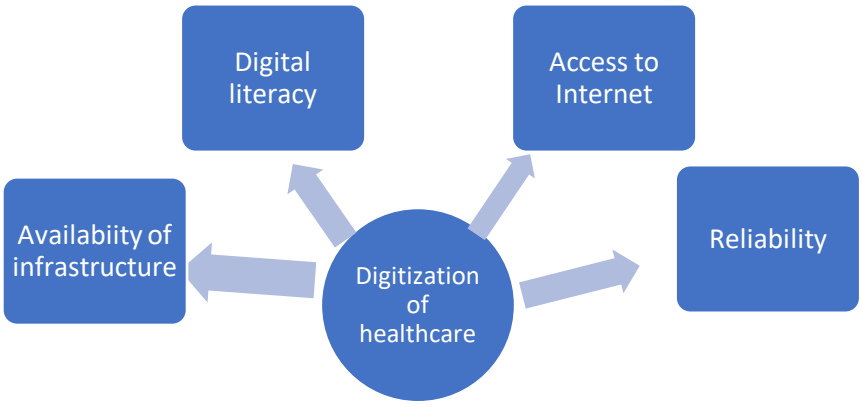

Fig.1 :Figure representing the theoretical model

b. Objective of the study:

The objective of the study is to analyze the 'digitization of healthcare' of respondents across India.

d. Research Design:

The data has been collected by 'systematic random sampling' for this study from the respondents across India by a Google form with 10 questions capturing the 4 variables. In 3months,221 samples were collected and among them 20 samples were not considered, as the data is incomplete in them for the study.Then we are left with a final data of 201final samples, which were considered for further analysis.

e.Data analysis:

'Exploratory Factor Analysis'(EFA) is used for the analysis of the study.It has been carried out by SPSS software. Further analysis of the study for 'Confirmatory factor analysis'(CFA) is carried out using'Adanco software' (Henseler, J,2015). Important factors have been extracted via 'Exploratory factor Analysis'. 'Varimax rotation' is considered along with 'Principal component analysis', to obtain maximum variance,(Hair et.al).To check eligibility of the study for factor analysis, 'KMO Bartletts test has been performed on the model data .The KMO and Bartlett's values are represented in Table 1 as shown below.

c. Hypothesis:

H_a: 'availability of infrastructure', 'digital literacy', 'access to internet', 'reliability' influences the 'digitization of healthcare'.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.794
Bartlett's Test of Sphericity	Approx. Chi-Square	561.607
	df	62
	Sig.	.000

Table 1:KMO and Bartlett's Test values

The KMO extracted in this study is .794,the value obtained is greater than 0.5,this implies that the study is eligible for factor analysis. The significance value obtained for this study is of.000 which is less than 0.05,which implies the rejection of null hypothesis (**H_0**) as well as acceptance of alternative hypothesis(**H_a**).That means, acceptance of the hypothesis; "'availability of infrastructure', 'digital literacy', 'access to internet', 'reliability' influences the 'digitization of healthcare'".

A 'path diagram'with all 4 variables has been constructed using Adanco software, which is the 'Confirmatory factor analysis' for the study. It is depicted in the figure 2

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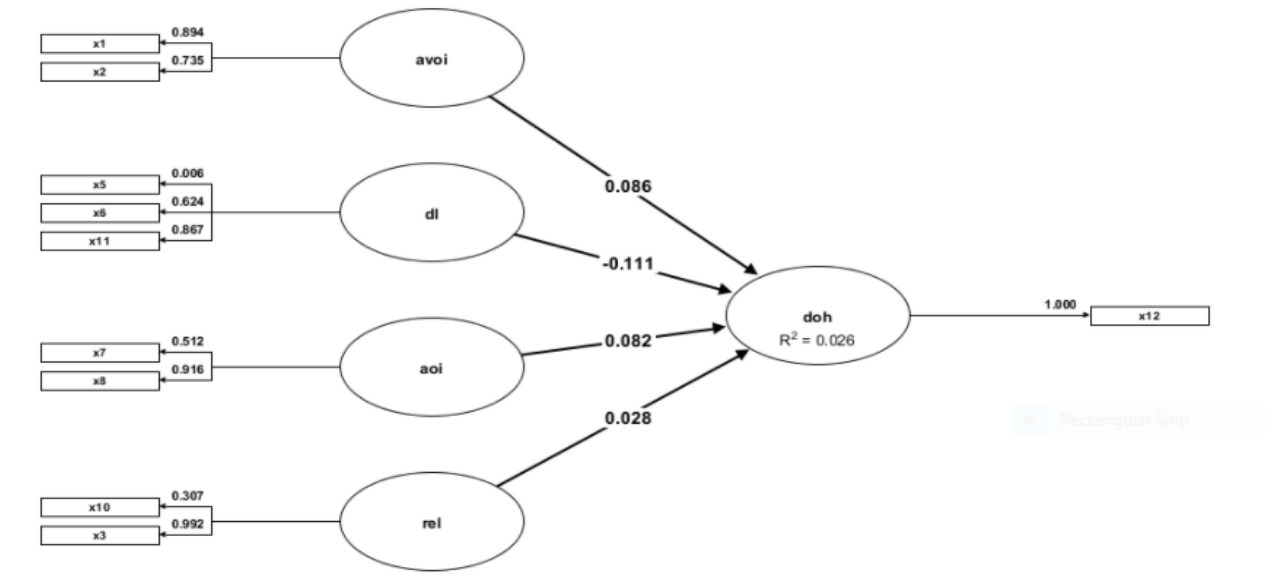

Figure 2: Path diagram of the model

The reliability of the variables are captured via Henslerr's rho values ,ranging from 0.51 to 0.72 and Cronbach's alpha values in the range of 0.52 to 0.69.The variable 'digitization of healthcare' is having a value of 1 as it is associated with only one item.

Construct	doh	avoi	dl	aoi	rel
doh(digitization of healthcare)	**1.00**				
avoi(availability of infrastructure)	0.0098	**0.669**			
dl(digital literacy)	0.0065	0.027	**0.38**		
aoi(accessibility of internet)	0.0094	0.095	0.016	**0.0551**	
rel(reliability)	0.09	0.044	0.047	0.0112	**0.538**

Table 2: Table showing Fornell-Larcker Criterion

The discriminant validity via Fornell-Larcker Criterion is represented in Table 2.

It is proved with each construct having a highest value across the respective column of the diagonal value, thatimplies the discriminant validity of the study.

The average variance extracted (AVE) in the study ranges from 0.38 to1. It provesthe convergent validity of the constructs. The adjusted R^2 value is 0.063representing a healthy value. The SRMR value is 0.139 which is less than 0.5 indicating the goodness of fit for the model. This concludes that the constructs identified via literature are fitting with theoretical model used.

Conclusion:

In this study the variable 'digital literacy' is playing prominent role, as any digitization happens only with awareness and digital literacy. The 'availability of infrastructure' also plays a critical role as the whole digitization crucially depends on the infrastructure. 'Accessibility of internet' and 'reliability' are also considerably affecting the 'digitization of healthcare'. The model represents the considerable factors influencing the digitization of healthcare.

Implications:

Government can use the model in identifying the factors influencing the total digitization of healthcare.

Limitations:

Due to availability of less data in the pilot study, the model strength can be proved with a little more data which can be used in universal scenario. From literature more constructscan be added to make an exhaustive model which can be collaborated for much higher order models

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A STUDY ON RECRUITMENT AND SELECTION PRACTICES ADOPTED IN IT SECTOR DURING THE COVID-19 PANDEMIC

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ABSTRACT

Recruitment and selection is one of the important functions that is to be performed by the HR department of the organisation. Due to the COVID-19 pandemic situation, the IT sector has completely shifted themselves to remote work, which has impacted all the functions of Human Resource Management including recruitment. HR mangers in IT sector are coming up with new recruitment and selection strategy using virtual platforms during these times.The objective of the research was to study the recruitment and selection practices adopted during the COVID-19 pandemic. The study provided insights on virtual alternatives adopted for each stage of the recruitment and selection process, its advantages and disadvantages, challenges faced by recruiters in adopting virtual recruitment and also received suggestions from them for smooth functioning of the same. Data was collected from 75 Recruiters belonging to the IT sector in Chennai who were involved in virtual recruitment and selection process post COVID-19 were chosen using snow ball sampling technique. Descriptive Research Design was used. Self- structured questionnaire was used for data collection through Google forms.

Keywords: *Online Recruitment, Covid -19*

Introduction

Recruitment is a process of attracting the potential candidates and selection is the process of choosing the right candidates, who are most suitable for a vacant job position in an organisation. It is one of the important functions that is to be performed by the HR department of the organisation as the success of the organization depends also on efficient man power.

Indian government declared the outbreak of COVID-19 as epidemic and the Epidemic Diseases Act, 1897 was invoked. The pandemic prevailing all over the world has led to the closure of organisations. COVID-19 has impacted all the functions of an organisation to a great extent and recruitment is no exception. The recruiters are coming up with new strategies of recruitment and selection to resume the recruitment and selection process.

Online recruitment has become a solution to recruitment during the pandemic. E-Recruitment or online recruitment uses web-based tools or virtual platforms to recruit candidates. This study is an effort to find out the virtual alternatives for each stage of the recruitment and selection process, its advantages and disadvantages, challenges faced by a recruiter and also suggestions for efficient functioning of the new recruitment and selection process.

Review of Literature

The success of an organisation does not depend only on the revenue of the organisation; it also depends on the man power of the organisation. Efficient manpower is achieved only when there is a good recruitment and selection practice followed in the organisation. Recruitment and selection is defined as the process of finding & attracting the potential candidates and selecting the best candidate among them for filling up the vacancies in the organisation. In the course of time, some of the steps in recruitment were done online in-order to save time and cost. The recruitment done online is called E-Recruitment, where recruitment happens through the usage of internet. Though recruiters found it cost efficient and time efficient, they wanted to have a personal connect with the candidate at some point as the manpower is an important parameter of an organisation's success.

Due to the corona pandemic prevailing all over the world since December 2019, organizations have reduced their hiring process to a great extent. However, the world is becoming ready for the new normal which is with the practice of social distancing. Recruiters are ready with a new strategy for hiring. Each stage of the recruitment and selection process is provided with a virtual alternative. Currently, the virtual

platform is used to a great extent by the IT sector and they also render their services to all other sectors.

E-Recruitment or online recruitment uses web-based tools or virtual platforms to recruit candidates. The processes of e-recruitment consist of attracting, screening, shortlisting, tracking applicants, interviewing, selecting, and offering jobs. It has been estimated by Cappelli (2001) that it costs only one-twentieth as much to hire someone online, as it does to hire the same person through traditional methods. Online recruitment also helps the employer in providing more information to the candidate. It is also most successful as a method for quickly reaching a large pool of the potential job seekers. Evolution of online recruitment began after 1990.In 1994, Monster.com first emerged as an online tool for organisations to connect with potential candidates which led way for more online job portals. Later, most of the organisations shifted themselves to an online recruitment process but their selection process continued to be offline. In the last decade, Tier-1 companies of IT sector had their selection process also online but still organisation prefer to have their selection process offline.

The following are the findings of Indian Readership Survey (IRS) on online recruitment from employer's perspective

1. An IRS (2004a) survey established that 84 per cent of employers use electronic recruitment to some extent and also found that the internet has become the fundamental part of the recruitment process.
2. The IRS survey found that organisations go on with online recruitment to cut the costs of their recruitment processes and get better value for money.
3. An IRS (2004a) survey found that only 3 per cent of the employers rated e-recruiting as the best method, although 56 per cent used it.

E-recruitment includes all the stages like the standard recruitment process. Stages of e-recruitment are as follows (1) Post job ads on company websites or job portals. (2) Screening can also be done by the options provided in the job portals. (3) Shortlisted candidates after screening can attend the online pre-employment tests. (4) Shortlisted candidates from the preceding stage can be interviewed using video interviewing software. (5) Background verification can be done using the available online providers. (6) Offer letter is issued to the selected candidate or candidates through e-mail followed by the induction.

Advantages of Online Recruitment and Selection are (1) It's cost effective. (2) Communication is done faster. (3) Able to reach a large audience. (4) Flexibility, durability and accessibility are higher compared to traditional recruitment and selection practice. (5) Hiring process is expedited. The Disadvantages are (1) It's informal. (2) At times it is difficult to analyse the candidate's behaviour and capacity. (3) It may attract a large pool of candidates which leads to increased competition and the hiring process gets extended. (4) The authenticity of the applicants is a great challenge the employer. (5) Possibility of technical glitches.

The Indian market for e-recruitment is still at least five years behind other countries but it has been estimated that e-recruitment is likely to grow in the coming years. According to an article sighted in the **Monster Employer Resources (2020)** webpage, the virtual recruitment begins with phone screening to decide whether to proceed with the respective candidate for further process and is then followed by the interviews. The interviews are conducted through any of the video conferencing applications and it can also be recorded for other hiring manager to be seen later and then decide on the selection of the respective candidate. The selected candidate then goes with remote onboarding. The employers must be prepared enough for onboarding as it is very important for the new joiners. They must be instructed and guided adequately to have a hassle-free onboarding. The recorded interview can also be used for any legal purpose if needed.

Masese F O &Uttam K M (2018), states that manpower is the key component of an organisation. In his study he states that E-recruitment is one of the means to attract a large pool of audience and it is economically beneficial to the organisation. It also helps the employers in finding the potential candidates. The biggest challenge faced by a recruiter in E-

recruitment is diverse culture management because online recruitment attracts global market.

According to the analysis of **Sultana Nafia& Sultana Nahida (2018),** large population of recruiters prefer online recruitment. Recruiters equally prefer company websites and job portals for online recruitment.

Mukundhan S (2019), in his study states that organisations use social media platform to build a strong relationship with candidates. Social media platforms like Facebook, Twitter, LinkedIn etc and also websites like Glassdoor, blogs, forums, job boards are used. Recruitment Marketing has become the new trend where marketing skills are involved in attracting the potential candidates through virtual platforms. Thus, employer brand plays a vital role in the E-recruitment practice.

According to the article written by **Madeline (2018),** Social Media helps both the employers and candidates to develop their own brand and build their network of experts. It provides a wide range of opportunities to the employers to communicate with the target audience. The candidates can have a mutual interaction with the employer. Social media recruiting also has the power to attract passive job seekers through creative ad campaigns. The article also dwells on a scenario in U.S where unemployment rate is reduced from 10% to 4% because of social media recruiting practice. It also states that social media recruiting creates a direct contact with the applicant compared to job boards method which also increases the credibility of the employer.

Barcelos K (2020), states that the corona pandemic has brought a long-term change in the recruitment process. Increased use of technology in recruitment post COVID-19 will create a skill gap which is one of the greatest challenges to be addressed by both employers and candidates. Employers should reframe their recruitment strategy and adjust it according to the current scenario. The changes brought by the pandemic need to be accepted to have an effective hiring. The changes such as effect of corona virus on global economy, large amount of remote working, budget to invest on technology needs to be accepted and considered while framing the new recruitment strategy. It is also suggested to use an effective application tracking system to handle the recruitment process seamlessly. The article also suggests some virtual platform like zoom, google meet for the selection process.

Statement of the Problem: A brilliant and virtuous manpower plays a vital role in the success of an organisation. Thus, every organisation will have to pay special attention to the recruitment and selection process. The pandemic prevailing all over the world has created a panic situation among the recruiters and job seekers as the organisations have reduced their hiring process to a great extent as the offices of organisations are closed. COVID-19 has impacted all the functions of an organisation to a great extent and recruitment is no exception.

If this situation prolongs then the existence of an organisation with an inadequate manpower will become challenging, so the recruiters have to brace themselves to face the changes brought by COVID-19. They have to shift themselves to virtual platforms which are going to be the new normal in the field of recruitment and selection. There are also various tools and applications designed for each stage of the recruitment and selection process. Recruiters are in an urge to adapt to the remote recruitment and selection practices which also has its own pros and cons. Recruiter has to compensate on so many aspects like miscommunication, avoiding malpractice on online aptitude tests, technical glitches from candidate's side and attitude judgement because it is difficult to evaluate the attitude of a candidate in a virtual platform. Though there was a practice of virtual recruitment and selection among the tier-1 IT companies, it is challenging when all companies have to go on the virtual platform for all the stages of recruitment and selection process.

Research Methodology

The general objective was to study the Recruitment and Selection practices adopted in IT sector during the COVID-19 pandemic. The Specific objectives were to identify the virtual alternatives adopted, to study the advantages and disadvantages of the new recruitment and selection practices adopted in IT sector, to study the challenges faced by the recruiters of IT sector in the virtual recruitment and

selection practices and to get suggestions from the recruiters in IT sector for smooth functioning of the new virtual recruitment and selection practices adopted during the COVID-19 pandemic. Descriptive research design was followed and the universe consisted of recruiters who were involved in the process of virtual recruitment and selection process under IT sector during the COVID-19 pandemic. Snowball sampling was used to identify 75 Recruiters from whom data was collected through a questionnaire administered via google forms.

Main Findings

It is found that 36 per cent of the respondents source candidates by doing job postings in job portals or social media, 36 per cent of the respondents use Linked In in their organization for the purpose of recruitment. It is found that 51 per cent of the respondents have said that online test was conducted before and is still continued even during the COVID-19 pandemic in their organization. Mettl proctoring tool is used for the purpose of proctoring the online test. It is found that 25 per cent of the respondents use Zoom virtual platform for group discussion in their organization and 25 per cent of the respondents use Google Meet virtual platform for group discussion and 60 per cent of the respondents have said that there is no reduction in number of rounds of interview in their organization as a result of moving to online mode. It is found that 87 per cent of the respondents have said that they outsource for background check and 83 per cent of the respondents have said that they outsource for document verification in their organization.

It is found that 33 per cent of the respondents have a neutral opinion on the reduction in recruitment cost, 39 per cent of the respondents have agreed that the time is saved, 36 per cent of the respondents have agreed that the communication, 28 per cent of the respondents have disagreed that there was a reduction in work load, 41 per cent of the respondents have agreed that they were able to attract large target audience, 40 per cent of the respondents have agreed that they felt easy to work with virtual platforms, 35 per cent of the respondents have agreed that they felt hard to manage the large number of applicants,

36 per cent of the respondents have agreed that they experienced technical glitches, 39 per cent of the respondents have neutral opinion that the candidates lacked knowledge in using the virtual platform, 37 per cent of the respondents have a neutral opinion that they lacked knowledge in using the virtual platforms, 37 per cent of the respondents have agreed that they felt challenging to judge the candidate without face-to-face interaction, 36 per cent of the respondents have a neutral opinion that they felt candidate's co-operation was not up to the expectation in virtual platform, 37 per cent of the respondents have a neutral opinion that they felt that candidates can forge their identity.

It is found that 38 per cent of the respondents have suggested that candidates could ensure good network connectivity for smooth functioning of the new virtual recruitment and selection practice adopted post COVID-19. Using Chi-Square test, it is found that there is no association between age of the respondents and Easy to work with virtual platforms. Using Chi-Square test, it is found that there is no association between experience in recruitment and challenging without face-to-face interaction.

Suggestions

- Organizations should have a recruitment team comprising of recruiters from different age groups, from more experienced recruiter to a fresher to have a dynamic and effective team in virtual mode.
- Organizations should develop their own customized application for the process of recruitment and selection.
- Organizations should use Artificial intelligence for screening large set of applications and scheduling interviews. This will help them to manage large pool of applicants.
- Organizations should have Identity Verification process before commencing with the recruitment and selection process to avoid any malpractice or forging.

Conclusion

Recruitment and selection is one of the major functions that is performed by the HR department of the organisation and only when

there is a good recruitment and selection practice followed in an organisation, there is an efficient and effective manpower available to maintain a healthy organisation and achieve success. Due to the corona pandemic, organisations are closed and the hiring has been reduced. There was already the practice of virtual recruitment among tier-1 companies of the IT sector but now it has become the solution to the entire sector. This study statistically proves that IT firms are turning to online recruitment to fulfil their manpower requirements and it is also successful in the current times. This research aids both the recruiter and jobseeker to know about the current practice of recruitment better as well as the improvisations to be done for smooth functioning of the recruitment and selection process. We should not be surprised that the future of recruitment might me completely virtual itself!

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CORPORATE SOCIAL RESPONSIBILITY AN EMERGING TOOL FOR MANAGEMENT INFORMATION SYSTEM: A STAKEHOLDERS' PERSPECTIVE

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ABSTRACT

Management Information System (MIS) plays a vital role in forming business decisions. MIS facilitates the Board of the company to take business decisions, to make plans for operation, development, and expansion of business. In addition, MIS caters to the information needs of various stakeholders to enable informed and strategic decisions. Unlike financial reporting, Corporate Social Responsibility (CSR) reporting is based on Comply or Explain approach. CSR reporting has emerged as an important tool since the implementation of the Companies Act, 2013. It has contributed to enhanced disclosures in corporate reporting and is still contributing to sustainable development in a societal context. This paper attempts to study CSR practices of Nifty Index based companies for the year 2018-19 based on secondary data. Results show that a majorityof companies have complied with spending on CSR but when a supermajority is considered, the companies fail such compliance. Results of the study have implications from managerial, stakeholders and regulators perspectives.

Keywords: *Management Information System, CSR, Stakeholders Theory, Sustainable Development, Disclosures*

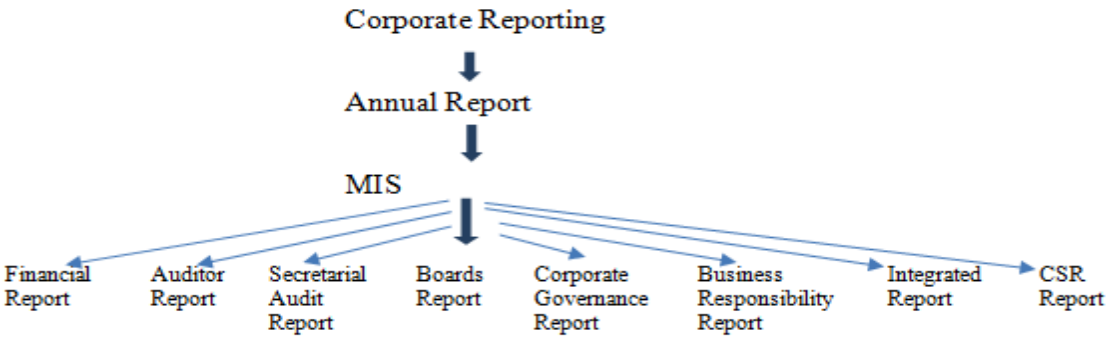
Introduction

MIS plays an important role in making business decisions. It also provides the information for the varied needs of stakeholders to empower them for better and informed decision making. In a corporate entity, MIS facilitates the Board to take a vital business decision, to plan for operation, development and expansion of business activities based on the data and information gleaned from various reports. Report means a record of facts. Reporting is generally done at the three levels of management viz., top-level, middle level and lower level. The management determines a chain of command, authority, and managerial positions and accordingly, managers obtain information, transit information, and take the decisions. These managerial roles and nature of reporting too are dynamic asthe business environment keeps on changing constantly, e.g., changes due to technology and Covid-19 pandemic. The main purpose of MIS is to evaluate the organisational performance and to take corrective actions if required to ameliorate such performance. So, the utility of reports and MIS is always in demand. Usual reports include informational reports, analytical reports, research reports, surveys, investigations, inquiries, statutory reports, non-statutory reports, routine reports, financial reports, non-financial reports, and budgets. Reports can also be classified as quantitative, qualitative, or integrated.

CSR is an emerging tool for MIS from stakeholders' perspectives. According to Friedman (1970), an employee has direct responsibility to conduct the business as per the discretion of the employer to maximise profit, i.e., without violating legal, societal, and ethical rules. According to Freeman(1984), the challenge of extant time is to manage stakeholders' interests without compromising business objectives. Carroll (1991) has described CSR as a multidimensional concept and he has advocated that CSR has four parts viz., economic, legal, ethical, and philanthropic.However, Friedman (1984) considers only three parts such as profits, legal compliance and ethical customs and has ignored philanthropic activities. The World Bank Council for Sustainable Development has stated that CSR is the ongoing promise by business entities for better development and life of the social community.According to Hill et al. (2007), CSR is the plan of the economic, legal, moral, and philanthropic actions of firms that influence the quality of life of relevant stakeholders. Following the CSR Rules, 2014, CSR means the activities which are included in Schedule VII of the Companies Act 2013. The

Board of a company is expected to conduct these activities as per suggestions of the CSR Committee for enforcement as a part of the CSR Policy of the company. CSR regulations require each company having a networth of Rs. 500 crores or more, or turnover of Rs. 1000 crore or more; or a net profit of Rs. 5 crores or more in any financial year shall form the CSR Committee by the Board to spend a minimum of 2% of the average net profit on CSR activities in the current year based on profits of previous three financial years as calculated U/s 381 and 198 of the said Act. Committee for CSR shall include a minimum of three directors of that minimum one director required to be an Independent Director. CSRCommittee will suggest the CSR activities and the Board will approve the suggestions and a disclosure of which is required on the website of the company. Further, the Board shall also ensure that amount is spentas per CSR policy. CSR activities stated in Schedule VII of the said Act are: eliminating poverty; advancement of education; encouraging gender equality; decreasing child death rates and enhancing maternal health; fighting human immunodeficiency virus and chronic diseases; safeguarding ecological sustainability; imparting employment-oriented skills; contributing to socio-business projects; donation to the Prime Minister's National Relief Fund or any other such account declared by the Central Government or the State Governments for socio-economic development and welfare of the backward classes, minorities and woman; and for any other matter. Even the activities of Swach Bharat Abhiyan and cleaningof the river Ganga are part of CSR. All CSR provisions of the said Act and CSR rules from 2014 to 2016 must be complied with by the companies in this regard.

The concept of CSR is supported by the Stakeholder Theory which emphasises the interrelated relations between the business and stakeholders. The theory argues that a firm should generate value for all stakeholders, not just for shareholders (Freeman, 1984). This theory deals with morals and ethical values. The popularity of this theory among researchers is apparent. CSR provides greater and non-conventional disclosures from stakeholders' perspectives. It measures the multifaceted and sustainable contribution of corporate entities towards society. It is a type of composite reporting since it considers spending on environmental, social issues such as poverty, health, education, and other relevant areas. CSR reporting gives a holistic idea to the management for effective and efficient utilisation of resources and decision making having a long-term bearing on business. Overall, CSR has contributed in terms of enhanced disclosures to better communicate timely information for managerial decision making and its most significant contribution in terms of spending on CSR for the furtherance of the interest of the stakeholders, as businesses are meant not only just for earning money(Myrna, 2001). It is also expected both government and the public should support CSR initiatives (Mrityunjay, 2009). Companies are expected to be good citizens and therefore they should not compromise when it comes to protecting societal interests. (Wulfson, 2001).It has been observed that CSR practices are beneficial to the stakeholders in many ways. It is a fact that some companies are unable to comply with CSR requirements. The possible reasons could be flexibility due to the "comply or explain" approach of CSR, lack of enforcing penalties for non-compliance, inadequate monitoring mechanism for CSR and so on. This study tries to assess compliance with CSR spending by the selected Nifty based companiesfor the year 2018-19 based on secondary data. The study contributes to the literature on CSR and is expected to be useful and relevant to the managers, the stakeholders, and the regulators. Hopefully, the results of the study will facilitate managers and stakeholders in wider perspective.



Source: Author

Figure 1: Conceptual Framework Model of CSR an Emerging Tool for MIS

Literature Review

Results of a study on sustainability had shown that among the world's largest 250 companies, 35% of companies shave reported on environmental and social reports in 1999, and 45% in 2002 (Simms, 2002). It has been observed that companies and various governments have shown seriousness concerning CSR activities. (Adms&Zutshi, 2004). A study exhibited that international companies have made significant CSR contributions in their domestic regions compared with non-domestic regions (Vikas, 2013).The positive influence of CSR on organisational performance has resulted in sustainable benefits in various countries (Rettab et al. 2009). Spending on CSR also results in better financial performance(Rajput et al. 2012). In addition, the firms having higher sales and profits, spend more on CSR.There exists a positive relationship between CSR and financial performance (Al-Smadi& Mahmoud, 2015).It was concluded that the stock market considers social disclosuresfor the valuation of shares and the cost of capital (Gonçalves et al.2013). CSR policy is good not only for companiesbut also for society for encouraging equitable and sustainable growth (Jain, 2014). Managers operating in strong CSR-oriented corporate cultures have a lowerpropensity to hide bad news and unscrupulous information and it is useful in finding companys' valuation. (Kim &Haidan, 2014). It was reported that only 15% of companies had spent more than 2% of the profit on CSR in the year 2012-13(Ramesh & Mendes, 2015).Compliance with spending on CSR was by just 20% of the companies (Sharma, 2016a) in the financial year 2012-13 at the time when CSR was voluntary. Later on, in the financial year 2014-15, such compliance has increased to 30% when CSR was mandatory. Further, in the year 2015-16 compliance with CSR has reached 50% (Sharma, 2016b) showing an increasing trend. About 49% of the 500 major Indian companies have reported on CSR practices (Gautam & Singh, 2010).Another study had detected that the results of corporate responsibility disclosure are not encouraging (Sharma et al.2009).The findings of Carroll &Shabana (2010) don't support the influence of CSR on the firms' profitability. They had recommended that firms should comprehend the business conditions for spending on different CSR activities in convergence with the firm's economic objectives and societal objectives. Companies are seeing CSR as a strategic tool (Berad, 2011). Their attention appears not on socialgood but a kind of commercial motive. The caring or the moral motive, followed by the strategic or profit motive are vital factors for firms to pursue their CSR policy(Arevalo &Arevind, 2011). Therefore, there is a need for alignment of the objective of the company with social objectives. Companies use CSR as a strategic management tool to augment feelings of pride and identification among employees allied with the organization (Jones et al. 2014). Therefore, firms that line up social goals with company goals employ CSR as a tactical tool to maximize value and firms with betterCSR performance have good potential to enhance value for all the stakeholders (Malik, 2014).

Developments in CSR can be brought about only with its thorough and contextualised understanding (Carol, 2016). There is a need for further research particularly on models of CSR because a model can portray the effects of a company's CSR on its stakeholders (Verma &Chauhan, 2007).Policymakers may decide to fix the social responsibilities at the firm level through proper enforcement and monitoring mechanism. There is a need to monitor the company's commitments towards meeting environmental responsibility (Firmansyah & Estutik, 2020). Simultaneously, firms have to be appreciated for investing in environmental and social projects, activities and for fulfilling their commitment towards social responsibility (Prasad et al.2019). Most of the studies had resolved that there are plentiful benefits of spending on CSR. Few studies have also exhibited a positive relationship between CSR and financial performance. From a regulatory, societal and economic perspective, it will be in the general interest of companies to comply with spending on CSR. CSR has the potential as an important tool for management decision making. Since managers will need to decide how much to spend on CSR which in turn has to be aligned with the objective of the company, they are expected to take important decisions from stakeholders' perspective and to have a serious concern about integrating CSR as a part of their corporate culture and policy framework to support the sustainable development goals and to ensure sustained profits, planet and people. This study has attemptedto assess compliance with CSR spending and contributes to the literature of CSR and is of vital relevance to the companies, the stakeholders and the regulators.

Research Objectives

1. To comprehend the concept of CSR and its regulatory aspects.
2. To ascertain compliance with the amount spent on CSR by the selected companies.

Research Methodology

A purposive sampling technique was used for the study. The sample consists of 45 companies that were members of the Nifty 50 Index.The selected sample companies have ownership and sectoral diversity. As this Index is comprised of top and larger companies, their practices may work as an ideal for other companies to evolve. Holder et al.2008had ascertained that the level and degree of disclosures and transparency are better in larger entities. Of these Nifty 50 companies, four companies viz., Bharti Airtel, SBI, Sun Pharma and Tata Motors have cited the reason that they had suffered a loss in the previous financial year(s), hence were not subject to compliance with spending on CSR and therefore were excluded. NestleIndia has followed the calendar year as a financial reporting period,hence it was understood that it will not remain comparable, so it was also excluded. In this way, the sample consists of 45 Nifty Index companies. The financial year 2018-19 was considered as the period of the study. Secondary data were gleaned from the annual reports of the companies. Data were analysed with the help of classification, tabulation, per cent and Z test, a test of proportion was also used for the study. Shukla & Joshi, 2010have also used the Z test to determine whether a majority of managers have a positive attitude towardsbusiness ethics.

Data Analysis and Discussion

Sr. No.	Companies
1	Adani Ports
2	Asian Paints
3	Axis Bank
4	Bajaj Auto
5	Bajaj Finance
6	Bajaj Finserv
7	BPCL
8	Britania
9	Cipla
10	Coal India
11	Divis Lab
12	Dr.Reddys
13	Eicher Motor
14	Grasim Industries

Data gleaned from annual reports of the following sample companies were analysed. Sample companies selected for the study are as follows.

15	HCL Techno
16	HDFC
17	HDFC Bank
18	HDFC Std Life
19	Hero MotoCorp
20	Hindalco
21	HUL
22	ICICI Bank

23	IndusInd Bank
24	Infosys
25	IOC
26	ITC
27	JSW Steel
28	Kotak Mahindra Bank
29	Larsen & Toubro
30	Mahindra & Mahindra
31	Maruti Suzuki
32	NTPC
33	ONGC
34	Power Grid
35	Reliance Industries
36	SBI Life Ins
37	Shree Cement
38	Tata Consumer Product
39	Tata Steel
40	TCS
41	Tech Mahindra
42	Titan Company
43	UltraTech
44	UPL
45	Wipro

Source: Business Standard (2021). Ahmedabad, 18th August:12.

Table.1. Sample Companies

Table 1 presents sample companies based on Nifty Index. This index is comprised of larger companies from different sectors across the country. The companies chosen belong to the equity listing on the National Stock Exchange.

Spending on CSR	**No. of Companies (%) in the Financial Year 2018-19**	
	Compliance with CSR Spending	**Non-Compliance with CSR Spending**
Minimum 2% of average net profit of three preceding financial years	37 (82.22%)	8 (17.78%)

Source: Author.

Table.2. Data on Compliance with CSR Spending

Table 2 divulges data of results on CSR spendingand compliance based on CSR reporting practices of Nifty companies. Of 45 sample companies, 37 (i.e., 82.22%) companies had complied with spending on CSR requirements. Further, 8(i.e., 17.78%) companies have failed to comply with the said requirement of spending on CSR norms. It has to be noted that while ascertaining compliance, even partial compliance with CSR spending has been considered a non-compliance.

Statistical Test

As per the nature of data gleaned from annual reports it was decided to adopt a Single-Sample Z Testinvolving proportions. Z Test based results were calculated using the following formula (Blalock, 1960).

$$Z = \frac{p_s - p_u}{\sqrt{p_u q_u / N}}$$

Where p_s= Percentage of the actual number of companies demonstrating full compliance.
p_u = Percentage of standard / null hypotheses, i.e., a supermajority as meaning atleast 75 per cent or more, hence 0.75 and a majority as meaning more than 50 per cent or more, hence 0.501. q_u = 1- p_u N = Sample size

Significance Level and Critical Region: The significance level of 0.2 and a one-tailed test were selected.

Hypothesis Testing

To comply with CSR regulations, it is required that companies spend on CSR activities once they meet the criteria as mentioned in the introduction section. Such compliance facilitates business in many ways, instances of which are cited in the literature reviewsection. The following null hypotheses were framed and tested.

H_1: There exists no compliance with 2% spending on CSR in a majority of the companies.

$$Z = \frac{0.82 - 0.501}{\sqrt{[(0.501)(0.499)]/45}} = 4.28$$

A normal distribution table will show that a Z score of 4.28 would occur approximately 0.01 percent of the time by chance if the assumptions were true and as it is less than the significance level of 2 per cent, the null hypothesis is rejected. It is concluded that there exists compliance with the 2% spending on CSR in a majority of the companies.

H_2: There exists no compliance with 2% spending on CSR in a supermajority of the companies.

Here, Z score is = 1.09, a normal distribution table will show that a Z score of 1.09 would occur approximately 13.79 percent of the time by chance if the assumptions were true and as it is more than the significance level of 2 per cent, we fail to reject the null hypothesis. It implies that evidence is not strong enough to establish that there exists compliance with the 2% spending on CSR in a supermajority of the companies.

Discussion, Conclusion and Implications

The main objective of the study was to comprehend the concept of CSR, regulatory aspects of CSR and to ascertain compliance with the 2% amount of CSR spending by the selected Nifty Index based companies. Based on secondary data from annual reports for the period 2018-19 and the application of the Z test, the study ascertained that a majority of companies have complied with CSR spending but in the case when a supermajority of companies was taken, they fail to comply with CSR spending norms. Overall, it is heartening to know that CSR spending is showing an increasing trend i.e., approximately 82% in the extant study compared with previous studies (Gautam & Singh 2010; Sharma, 2016). Further, it has been observed in the study that out of 45 sample companies, eight companies failed to comply with spending on CSR as per norms, of which 50% are banking companies. Overall, findings suggest that companies have a good level of CSR spending but need to enrich compliance levels in the general interests of the society and for inclusive developmentof the nation.

Furthermore, companies that had not complied with spending on CSR is probably due to the flexible approach known as the “comply or explain” approach. As per CSR regulations, in case of companies have failed to comply with spending on CSR, they essentially are required to disclose reasons for the same. As the implementation of penalties and monitoring mechanisms is not very strict, instances of non-compliance are going to be apparent. In case if companies have opted for CSR activities having long-term projects, it could delay their spending on CSR. The novel Covid-19 pandemic has also played its dual role and has important consequences for spending on CSR activities. E.g., while spending on CSR, expenditure on health issues such as Covid-19 provided a unique idea and opportunity as well to spend as a part of CSR expense and simultaneouslyCovid-19 could defer the spending on CSR due to pragmatic issues in business operations as usually experienced. It is advisable that managers opt for short-term projects for spending on CSR and simultaneously they have an option to contribute such an amount of CSR spending of their non-compliant companies to the Prime Minister's National Relief Fund or fund set up by the Central Government and the State Governments for socio-economic development and for the welfare of the backward classes, minorities and women to achieve greater compliance.

In consonance with the spirit of Stakeholders Theory and the concept of CSR, the Board of Directors and the managers are expected to play a stewardship role for the protection of the interests of stakeholders. To achieve this, the most important function is the management and better governance of companies which in turn requires robust MIS for decision making as higher-level management is mainly concerned with decision making based on corporate reporting framework. Annual reports are important vehicles of information and contribute to the corporate reporting framework. Annual reports contain CSR reports which aid the managerial decision-making process. CSR is the subset of MIS. MIS includes many reports one of them is the CSR report which has emerged as an important tool for management since the inception of the Companies Act, 2013. The reason is that utility of the spending on CSR has been an important significant beginning in an emerging country like India for its growth, development and social perspective as CSR norms have become a part of the company law. In a broader sense, the spending of CSR on various important areas for inclusive, societal and sustainable developments such as education, environment, health including chronic diseasessuch as the Covid-19 pandemic has been commendable regulatory developments.

Hopefully, stewards will continue the momentum of spending on CSR in true spirit and the government is expected to develop CSR monitoring mechanisms, levy penalties for non-compliance and also provide a motivation for better compliance. It is anticipated that penalties due to non-compliance of CSR regulations and prioritization of areas for spending on CSR may be more fruitful pragmatic proposals for better adherence, in addition to the increase in public awareness which will pay the way for the integrated performance of enterprises (Kanji&Agrawal, 2016). In consonance with these views, monitoring the company's commitments towards meeting environmental accountability (Firmansyah&Estutik, 2020) for societal interest is the need of the hour. Regulators may determine the environmental and social responsibilities at the firm level through proper discourse and are expected to promote monitoring mechanisms for achieving full compliance on the spending of CSR. Similarly, firms had to be cherished for investing in environmental and socially responsible projects, for spending on CSR activities and their committed efforts towards social responsibilities (Prasad et al. 2019). To conclude, managers need to take important decisions from stakeholders' perspective and if it is done genuinely, the serious concern of integrating CSR as a part of corporate culture and policy framework will be automatically reflected in their behavioural aspects at the organisational level and this will pave the way for the attainment of the sustainable development goals with ensured and sustained profits, greener planet and ethical people.

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INDUSTRY 4.0 AND LEAN APPLICATION LEADS TO SUSTAINABLE BUSINESS PRACTICES IN AVIATION INDUSTRY BY MANUFACTURING TIME REDUCTION OF COMPONENTS.

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ABSTRACT

Industry4.0 is fusion of technology which will establish a high tech business in aviation field. Aerospace manufacturing, aeronautical manufacturing leads towards business of helicopters, aircraft military, aircraft civil, rocket and satellites etc. Industry 4.0 propel the future model of business by applying robotics automation by artificial intelligence, simulation, augmented reality, horizontal and vertical system integration, additive manufacturing or 3-D printing, IOT or IIOT, cloud computing, cyber security. By application of these pillar of Industry4.0, manufacturing in aviation field will scale up and after that manufacturing time will reduce, business in aviation field will increase exponentially by keeping quality high in less time elapsed during manufacturing of components of aviation field. Manufacturing cycle time reduction is a very much challenging task for especially aviation manufacturing organization due to have an influence for many factors, complex interaction of operations and time involved in operations. If different operations time is reduced, labour time will be reduced and delivery time also will be marginally influenced and reduced. Thus reduction of time in operations will lead reduction in delivery of helicopters or aircraft to customers. Some basic principles and approaches are applied to reduce manufacturing time. A conceptual work is applied which influence the factor of reducing the operational time in manufacturing of aviation components which are mostly long cycle components. This research will give a direction and guidance to industrial practitioner as to how reduce the throughput time by calculating and evaluating the value of operation of machine or process or inspection or movement or queuing etc in term of numerical value of time study in manufacturing of critical components of aircraft and helicopter. To sustain in business, any organization need to go for modernization of their system by industry4.0. Industry 4.0 leads with high revenue generation and growth in business of helicopters, aircrafts, ships, aerospace satellite, rockets etc.

Keyword: *Manufacturing cycle time, Cycle time reduction, Throughput time, Throughput time reduction.*

Introduction

Manufacturing cycle time is a time elapsed for a raw material or sub-assembly to move through manufacturing processes. Cycle time consists of set up time, machine processing time, quality inspection time, transportation or move time and waiting time for loading in another machine etc. Process time is the time period required during the work is performed on the product itself. Inspection time is the time during which the quality of the product is confirmed. Transportation or move time is the time duration in which materials or works-in-progress (WIP) are moved from one workstation to another workstation. Queue time is the time during which the product awaits to load in machine or transfer to a workstation, undergoes further inspection and succeeding manufacturing processes. Manufacturing time consists of time elapsed in, from loading of raw material on machine to finish the product. To manufacture a component, many factors are involved. We are more concerned in manufacturing time or throughput time reduction through optimizing the manufacturing processing time, movement time, inspection time, cell formation etc for helicopter or aviation components manufacturing. The times are involved in loading on machine as waiting time to load on machine, machine set up time, machine or labor run time on machine, operation or process time in machine, inspection time, movement of components from one machine to other machine, stage inspection time by inspector, movement time of components from machine to Heat treat shop and heat treatment process time, movement time of components from heat treatment to machine , again movement time of components from machine shop to process shop and it's processing time like that the path of flow/movement of components during manufacturing. Finally finished product is moved from finishing shop to store or dispatch for customer. All the activities are the operations and all the operations are concerned with time elapsed. If operations time is being controlled without

affecting the quality, then upto some extent we can reduce the time during manufacturing. , Industry 4.0 referred to Germany's attempts to integrate digital technologies into its national manufacturing strategy. Manufacturing possibilities will be multiplied by emerging technology breakthroughs in fields such as artificial intelligence, robotics, the Internet of Things, autonomous vehicles, 3-D printing, nanotechnology, biotechnology, materials science, energy storage, and quantum computing. They collect huge amounts of data from smart sensors through cloud computing and IIoT platforms that allow them to uncover patterns that help them improve the efficiency of supply chain management and manufacturing production by time reduction. The application of Industry4.0 and lean have changed the world in manufacturing in field of aerospace and aviation products as helicopters, fighter jet, ships, rockets etc and their emerging global business.

Literature Review

The previous some researchers are mentioned who have done a lot of work on manufacturing time, manufacturing cycle time, throughput time reduction, lead time reduction, cycle time reduction in manufacturing field.

For reducing Manufacturing Throughput time, a framework was established by Danny J. Johnson, 2003 [1]. The framework is detailed to provide a direction and guidance to manufacturers to reduce throughput time. A flexible manufacturing system (FMS) consists of a set of workstations, capable of performing a number of different operations, interconnected by a transportation mechanism, (Joseph G. Kimemia, 1983 [2]. The waiting time is referred sometimes as waiting in batch and waiting to come next batch respectively by Hopp and Spearman, 2001[3]. Variability often come in arrival of material and process of manufacturing which can be either controllable or random variation by Hopp and Spearman 2001[3]. The setup time of machine, processing time on part, and move time of material or work in progress are independent of each other (i.e., a reduction in move time does not affect setup time or processing time per part, and so on), changes in any of these components of times, can affect the waiting time by Hyer and Wemmerlöv 2002 [4 & 5]. Waiting time is usually the largest of the four components, accounting for as much as 90% of manufacturing lead time in some systems by Houtzeel 1982 [6]. In Setup Time Reduction, the dedication of Workstation and family scheduling can also reduce the number of setup and its setup time of machines. Further information on improving setup procedures can be found in works by (Steudel and Desruelle, 1992 and Shingo, 1985 [7]. In Arrival variability, when workstation's machine utilization is low and machine with operator is idle, then a substantial portion of the time and each job arriving to the work station, finding the station is idle. In this case, variability in the time between arrivals of jobs tends to directly impact on output as variability in departure from machines. Then departure variability is reduced as by increasing the number of identical resource at the workstation by Hopp and Spearman, 2001 [8]. This framework provides an easy tool to industrial practitioner; they can use to determine a course of action to reduce manufacturing throughput time per part in their own plants byDanny J. Johnson, 2003 [1]. A Case Study is done on Reducing the Lead Time and Increasing Throughput by using Value Stream Mapping by Gokulraju et al., 2016 [9]. Lean Manufacturing, also called Lean Production, it is a set of tools and methodologies that aims for the continuous elimination of all waste in the production process. The main benefits of lean manufacturing are lower production costs; increased output and shorter production lead times by Gokulraju et al., 2016 [9]. Batch production and departmentalized machines are key contributors to long lead times. Value stream mapping is used to help identify areas of potential improvement to reduce lead times and increase their output or throughput. It was used to construct a current state value stream map by Gokulraju et al., 2016 [9]. The value stream is defined as the specific activities with a supply chain required to design order and provide a specific product or value by Hines and Taylor, 2000 [10]. Value Stream mapping of Rubber Products manufacturers by Jeffery, 1998 [11]. Redesign the value added chain of a service process in a commercialization steel firm at Monterrey, Mexico (Juran, 1999) [12].

By applying 5s, waste can be reduced. Waste could be in the form of scrap, defects, excess raw material unneeded items, old broken tools, and obsolete jigs and fixtures by Monden, 2012 [13]. Seiri: To make a move the items, tossing it to do away needless items, it will make material flow consistently or smoothly, and where workers & work move easily (Feld, (2000). Seiton: This will make it the right place and will make tools, jigs, fixtures and resources noticeable, detectable, andit may be easy to use (Feld, (2000). Seiso: A well maintained workplace can create a healthy environment to work there (Feld, 2000). Seiketsu: A regular observation, audit or check should be arranged to do and scoring should be assigned to everyone, as responsibility to maintain a high standard of housekeeping and cleaning Feld, (2000).

Shitsuke: Management should do gemba as a walk to shop floor and explain what they want from people, reward those who follow the 5s and instruct strictly those who don't follow (Feld, 2000).

Review on Cycle Time Reduction in Manufacturing Industries by Hiten Patel & Sanjay C. Shah, 2014 [14]. Manufacturing Organizations faces a challenge in reduction of cost and efficiency in their manufacturing Operations. How to Cut Manufacturing Throughput Time by Xenophon A. Koufteros , The University of Texas [15]. Manufacturing firms are facing an environment where success depends on quick response to customer demands, as time-based manufacturing practices which can reduce throughput time. Time-based manufacturing is defined in terms of organizational-level practices that reduce throughput time by Koufteros, Vonderembse, and Doll, 1997 [15]. The implementation of manufacturing cells for manufacturing of their part family by Wemmerlov and Hyer, 1989 [4 &5]. The establishment of quality improvement efforts during manufacturing sector are delineated by Juran, 1999 [12]. The initiation of effective preventative maintenance programs can be implemented for machines availability by Schonberger, 1996 [17], and these are viewed to make available the resources for manufacturing. The abilities to develop a base of the time reduction is dependable on suppliers of accessories and associated details and to achieve pull production system as customer demand or internal user demands by (Monden, 1983 [13] and these are also enhanced by shop-floor involvement. A Throughput Time Study on Gemba through ABC Analysis for High Demand Product among Varieties of Products (Raj Mohan R &V.Senthil Kumar, 2013) [18]. Reductions in manufacturing throughput time increases flexibility and respond to customer orders supply on time by Raj Mohan R &V.Senthil Kumar, 2013 [18]. Time to be measured as per operation or activities where machine and man are working, Taylor, 1985 [19]. "Industry 4.0 is the fusion of these technologies [AI, big data, IoT, bioinformatics] and their interaction across the physical, digital, and biological domains that make the Fourth Industrial Revolution from previous revolutions which are diffusing faster and more broadly than any of the previous revolutions",World Economic Forum Klaus Schwab,[20].

Rational of Study

At present scenario, the operational cycle time for manufacturing of critical components of aviation asset as a helicopter or aircraft is very important. Critical components are defined as the components which are installed for functioning in different critical stage of helicopter or aircraft assembly under following conditions and environments. Critical components are long cycle items; it takes more time to manufacture than other components.

The components which are critical because they are functioned in different kind of environments and different working conditions. The aviation flying machine as a helicopter or aircraft may fly under different type of climate & environment. The components of aviation asset may have to function under different working conditions as High humidity, High temperature, High pressure, High Tensile load/force, High compressive load/force, High torque & high torsion, High stress, High strain, High centrifugal stress & centrifugal strain, Moment, momentum & Angular momentum etc. Critical components significance is much higher than other components with respect to functional sustainability and bear ability.More than 50% of total time of any aviation machine is concentrated in manufacturing of critical and

long cycle components, these are very high in weight and huge in volume and big in dimension/ size. Thus operational cycle time is directly involved as a ingredient factor in term of time elapsed for aviation flying machine. The components are working under high tension, compression and rotary dynamics condition. We will see the proportion of critical components operations.Static critical and dynamic critical components are around 5% in helicopter but these are long cycle items and around 40-50% time it takes as manufacturing of entire helicopter.If manufacturing time reduction takes place in critical components manufacturing, it will have a significant or huge time reduction in entire helicopter manufacturing. We will see all activities and its time elapsed for critical components as to how way their manufacturing throughput time is reduced.

Research issues: (Macro level)

From the preceding Conceptual Framework, Literature Review, gap, and during flow of raw material or semi finished components from store to finished components, the following research issues are identified:

1. Analysis of process time, queue time, inspection time, move time or transportation time during manufacturing the components.
2. Analysis of idle time of labor.
3. Analysis of machine breaks down.
4. Analysis of lost time in machine utilization w.r.t man, machine, material availability, tool availability etc.

Research objective (Micro level)

1. Analyze the activities involved in manufacturing from raw material to finish product in time measurement unit.
2. Measure the length of time of different operations under processing time, queue time, inspection time and move time.
3. To observe and noting down the time in value against activities and operations during manufacturing.
4. To determine the manufacturing throughput cycle time based on using of machine set up time, machining time, queue time, move time and inspection time.
5. To calculate the reduction time from existing and proposed state of manufacturing management system in numerical as well as percentage.

Research Methodology/ Data Collection/ Proposed Tool and Analysis:
Data collected for critical components of helicopter of ABC aviation industry and apply different approaches /methodologies towards objective of research.
Approaches/Tool/ Methodologies:

- Toyota production system
- Lean Manufacturing concept (5'S & 8-Waste)
- GT-Group Technology
- U-cell formation
- CAD/CAM application
- Industry4.0

Non value added operations typically accounts for 90% of total manufacturing cycle time and it leads to lead time as higher and higher. We need to study the value added activities and non-value added activities and to reduce time for non-value added activities.
Two type of activities of operator on machines are involved

a) Internal activity: Activity on machine. Mounting/removing job/ tools from machine.
b) External activity: Activities outside the machine. Drawing, IS, bringing tool, material etc

a) Internal Activity (Activity on machine)

- Set the operation programming.
- Machine setting -Tool, die & fixture setting.
- Starting the machine.
- Holding the job / apparatus / switch / machine handle etc.

b) External Activity (Activity outside the machine)

- Bringing the tools.
- Bringing the raw material
- Searching the material / tools / gauge / dial-indicator/ clothes/ waste clothes

All the external activities are down time / idle time/ waste / non – value added activities. It may be somewhat minimized or it may be fully

/partially eliminated by using modern and latest technology having machines e.g.:

a) F.M.S—Flexible machining system.
b) 3-Axis, 4-Axis, 5- axis CNC machine for a lot more operations at a time.
c) Instead of conventional lath, CNC (computerized numerical control) lath, NC (Numerical control) lath should be used.

List down the non-value added activities / idle time of each component.

- Delay in collecting the raw material from material store.
- Raw materials are waiting to load in machine physically in machine shop.
  We have observed the time of activities as well as entire operations along with associated factors such as waiting time, inspection time, and movement time. Description of Existing manufacturing cycle time & proposed manufacturing cycle time is shown in table.

We go along these steps for reduction of manufacturing cycle time Analyze the operation cycle time for each operation. "Existing operational cycle time "is written in table against each operation for each component and we are suggesting to: "proposed operational cycle time "by applying all the methodologies:
Toyota production system, Lean manufacturing concept (5'S &7-Waste), GT-Group Technology, U-cell formation, CAD/CAM application.Critical parts are long cycle items. It takes more and more time in manufacturing as per operation than other component's manufacturing time which is assembled in aircrafts or helicopters. Existing manufacturing cycle time includes the following time components:

(1) Processing cycle time,
(2) Compensatory relaxation allowance (C.R) time & Contingency allowance (C.A) time
(3) Inspection time,
(4) Part preparation time
(5) Queuing time
(6) The time taken in Zig-zag or criss-cross movement of materials from one machine to another machine or one place to another place for other operation.

Above all constituent of time takes (10-35) % of total manufacturing cycle time by observation of time study for Machining or processing time.
Our objective is to reduce the total existing manufacturing time to a range of extent by applications of different tools by focusing on the stages of flow of raw material and flow of semi-finished components.

(A) The Compensatory relaxation allowance(C.R) time & Contingency allowance(C.A) time, inspection time, Part preparation time (arrange job ticket , rout card , drawing & instruction sheet), Queuing time and those are unidentified, are aimed to be reduced.

(B) The existing manufacturing throughput cycle time is reduced up to Achieved / Arrived manufacturing throughput cycle time against each operation by

(1) using and applying of high technology for design and process (methodology and process change for operation).
(2) Using higher version machine e.g (3-Axis, 4-Axis machine, 5-Axis machine etc in place of conventional machines.
(3) CMM (Coordinate measuring machine) for inspection of complicated parts etc. whichhave complicated and intricate profile, in place of conventional way of inspection.
(4) Toyota Production System
(5) Cellular Manufacturing System
(6) LEAN Manufacturing Concept
(7) One piece flow system
(8) Self -inspection by operator and machine itself
(9) Reduced batch quantity
(10) Increase no of components of same kind of operation means same or similar part families components.
(11) Decrease the no of batches or set up or batch size.

We have assumed self- inspection by machine operator itself and machine itself & one piece flow concept , U-cellular concept in cell , a progress-person are available for immediate movement of parts/materials to reduce queuing time and finally it is checked by one inspector at last of U-cell or inspection should be done by operator itself. On above fixed condition, we have observed the existing manufacturing

cycle time which are reduced to as Arrived manufacturing cycle time against each operation.Labor set up time is just as Machine set up time and Labor run time is just as Machine run time. As long as machine runs, so long as labor runs (i.e operator run time) similarly to machine set up time means time taken for setting the machine by labor (operator).
The factors involved to reduce the operation cycle time:

1) If quantity is increased, unit set up time is reduced.
2) If we use CNC machine instead of conventional machine, no of set up's time is reduced.
3) If we use CNC machine instead of conventional machine/ Numerical controlled machine, programming time is reduced.
4) No. of passes based on material grains and its dimensional size for cutting is required for rough cutting or achieving final dimension as per drawing. The more pass is required for achieving final dimension of components.

Conceptual approaches as correct scheduling, plan and operational plan can reduce the preparation time. More quantity of same kind of components in size and profile whose operation is same or similar, less number of batches or set up also may lead to take less operational cycle time.

Tool applied as Conventional Lath with applying tool of RMS (Reconfiguring manufacturing system), VSM, ,TQM, TPS, Zidoka, Kaizen, 3M,JIT,5s, Kanban, SMED, Pull system, SPC, Unit batch or reduced batch quantity, Bottleneck as machine line balancing, TPM,GT, U-Cell formation, CM, CMM Inspection, Industry4.0 etc.
The manufacturing of Stub Shaft which is a critical component of helicopter and transmits the rotational power from Main gear box to Main rotor blade. The stub shaft is manufactured through many manufacturing processes and operations according to their required order of methodical operation on requisite machines of machine shop, heat treatment shop and process shop etc.
The manufacturing dataare taken from ABC Company and their associates suppliers and vendors and are morphed. This data is to profound a relationship and concept between machine set up time and machine run time, through developed and derived tables, chart and graph model, to arrive the result as per stipulated objectives

Machines, Bench	Operations	Set up time (Min)	After tool apply, Set up time (Min)	Machine run time (Min)	After tool apply, Machine run time (Min)	Existing Manufacturing Time= Set up time + Machine run time (Min)	Arrived Manufacturing time against m/c & operation after tools applying.(Improvement in Existing manufacturing system) (Min)	Difference between Existing time and Arrived time (Min)	% of Time reduction = [(Existing Time- Arrived Time)/Existing Time]*100 (In %)
HMT LATHE	Hold in fixture and polish copper plate	75	60	30	20	105	80	25	24
BENCH	Deburr	35	25	15	10	50	35	15	30
Drill machine	Set part and open out the holes.	90	75	30	20	120	95	25	21
102 HMT LATHE	Hold in soft jaw and clean the grooves.	75	62	60	47	135	109	26	19
Cylindrical Grinding m/c	Grinding between centers, make chamfer and hone sharp edge and make concentricity	75	62	60	50	135	112	23	17
Bench Work	Deburr	35	25	15	11	50	36	14	28
Cylindrical Grinding m/c	Grinding between centers and obtain requisite dimension.	135	115	135	120	270	235	35	13

Process shop	Shot peening on diameter.	60	45	90	75	150	120	30	20
Process shop	Shot peening on diameter.	60	45	90	72	150	117	33	22
Process shop	Clean chemicals to remove corrosion	60	45	10	7	70	52	18	26
Process shop	Nickel plating	180	150	300	260	480	410	70	15
Process shop	De and Re coppering as per required dimension.	180	150	200	175	380	325	55	14
Cylidrical Grinding m/c	Grinding between centers as per IS.	135	120	210	185	345	305	40	12
Cylidrical Grinding m/c	Grinding between centers as per IS.	135	120	120	105	255	225	30	12
102- HMT LATHE	Rework to remove materialand cut and hone sharp edge	75	60	90	70	165	130	35	21
BENCH	Remove burr	60	46	20	15	80	61	19	24
102 -HMT LATHE	Remove Nickle plating on grooving	90	75	45	30	135	105	30	22
Bench work	Remove Nickel plating on teeth	15	10	120	100	135	110	25	19
Cylindrical Grinding	Grinding between centers and hone the sharp edges	135	120	150	120	285	240	45	16
Process shop	Shot peening	60	45	270	240	330	285	45	14
Process shop	Nickel plating	60	45	240	210	300	255	45	15
Process shop	De and Re copper plating	60	45	80	55	140	100	40	29
Cylindrical Grinding	Grinding between centers as per IS.	135	120	150	120	285	240	45	16
Internal Grinding	Grinding to remove Nickel.	90	75	90	70	180	145	35	19
TOTAL		2110	1740	2620	2187	4730	3927	803	17

Table-1	Time
Set up time (Min)	2110
After tool apply, Set up time (Min)	1740
Machine run time (Min)	2620
After tool apply, Machine run time (Min)	2187
Existing Manufacturing Time= Set up time + Machine run time(Min)	4730
Arrived Manufacturing time against m/c & operation after tools applying. (Improvement in Existing manufacturing system) (Min)	3927
Difference between Existing time and Arrived time	803
% Time reduction = [(Existing time- Arrived time)/Existing time]*100(In %)	17

Graph-1

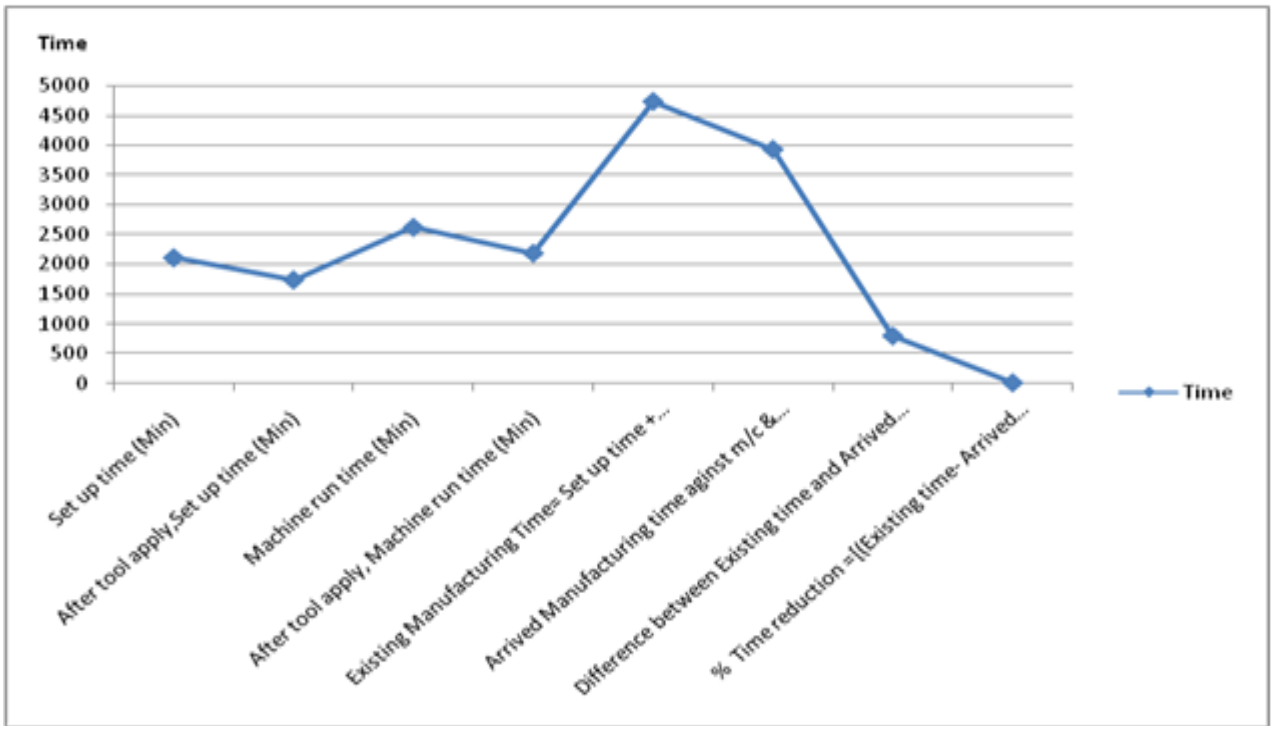
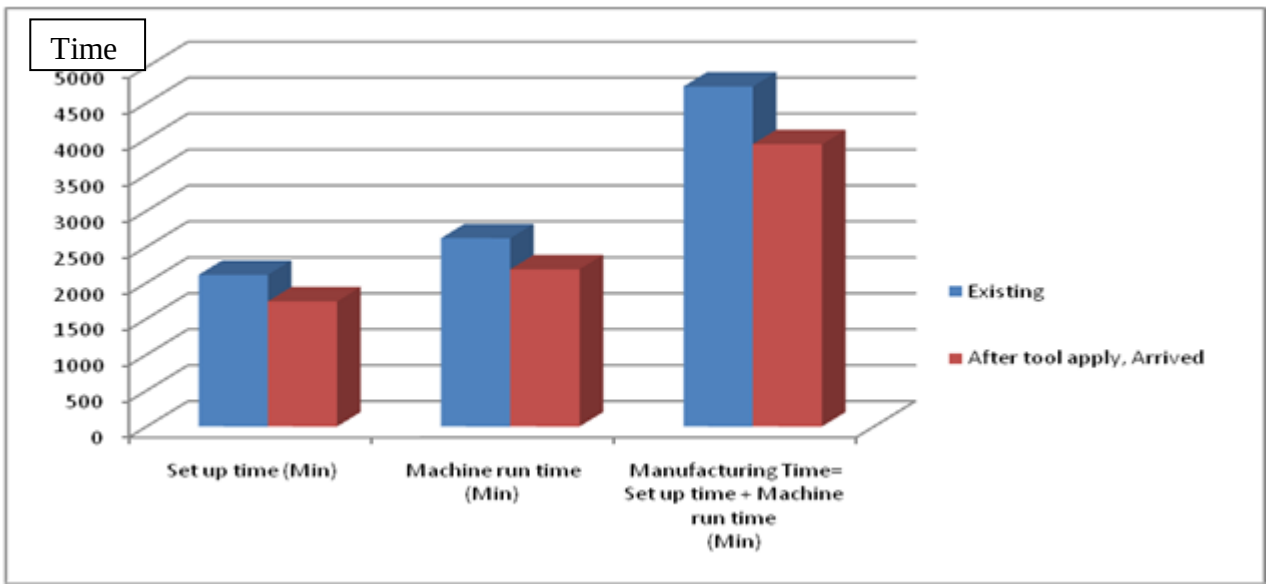


Table-2

Time	Existing	After tool apply, Arrived
Set up time (Min)	2110	1740
Machine run time (Min)	2620	2187
Manufacturing Time= Set up time + Machine run time (Min)	4730	3927

Chart-2



Findings/ Results:

1) The manufacturing throughput time is reduced.
2) The operational cycle time is reduced.
3) Reduced the existing standard man hour (SMH).
5) Reduced the idle time of man and machines during manufacturing.
6) Man power is reduced for prefixed existing load on machines.
7) The movement of components is reduced.
8) To deliver the components to customer on time or in less time.

9) To research the innovative and creative methodologies and approaches in field ofaviation manufacturing.

Limitations

1) High capital is involved to execute the layout change and revival of old machine or purchase high capital involved machine. Capital deficit may be.
2) Space constraint may be in cell or near to machine shop, to set up the low cost and small sized heat treatment shop and processing shop.
3) Skilled operators are required for CNC machine.
4) Heat treatment shop & process shop should be in order or just near to machine shop to reduce the movement time of material for concerned operation.
5) A high valued capital machines are required.
6) Varieties of structural components and equipping components of helicopters cannot be machined in one cell because of many operation but those are not as per order of machine layout.
7) A heat treatment units and process shop units are required near to U-Cell but space constraints are there.
8) Many components of medium & short cycle items having least operations & diversified operations, then all machines and materials cannot be uniformly balanced in term of loading and machining. Hence capacity of machine shop may have to increase.
9) Provisioning of high cost machines.
10) Skilled man power & machine capacity enhancement.
11) Space constraint in m/c shop area.
12) Lack of budget allocations for new technology and advance machines.

Significance of study

1) SMH means standard man hour is reduced.
2) Timely delivery is possible.
3) Quality can be enhanced by applying CAD & CAM technology.
4) To reduce and control the excess hours which are used in conventional machine or older machine of all kind.
5) Improve productivity.
6) Lead time reduction.
7) Reduce engineering personal requirements.

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E-BOOKING DISTRIBUTION STRATEGY FOR TOURISM INDUSTRY 4.0

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ABSTRACT

The tourism sector is at the forefront of transforming the perspective of tourism distribution strategy and the business sector around it, thanks to revolutionary technologies from Industry 4.0. Customer adoption of the Internet as a suitable medium for booking tourism services has accelerated due to structural developments in the tourism industry. Any insight into how consumers make decisions in the internet world could be crucial to a company's success. In this context, the aim of this study is to analyse the perceived advantages of e-booking in different sectors of the tourism industry.The field of the current study is the various registered business units in different sectors of the tourism industry in the state of Kerala in India. For this a set of perceived advantages have been identified. Primary data was collected using structured interview schedules from 775 tourism units comprising different categories of tourism sectors. The resultshows that there is significant difference between Hotels & Resorts, Homestays, Houseboats, Ayurveda centres and Travel agent/ Tour organiser in level of perceived advantages of using e-booking facility.

Key words: *E-booking, perceived advantages, ICT, distribution strategy*

Introduction

The use of electronic devices in tourist operations is becoming increasingly important in the tourism and travel business. The tourism sector is at the forefront of transforming the perspective of tourism distribution strategy and the business sector around it, thanks to revolutionary technologies from Industry 4.0. The digitization era is increasingly altering consumers' thinking and decision-making processes.Because of the rapid advancement of ICT(Information and Communication Technology), a new concept in tourism has emerged: electronic tourism (e-tourism) (Shaffee, et al. 2019). One of the most prominent users of ICT is the tourism industry. The tourism sector employs the e-booking system to interact, market, and sell its products to customers who are located outside of the location. E-booking is a significant instrument for a tourism business unit that gives it access to a global market.The Internet has been a major driver of tourism growth, particularly in recent years. Customer adoption of the Internet as a suitable medium for booking tourism services has accelerated due to structural developments in the tourism industry. The advent of online platforms, cell phones, and apps has drastically altered how tourists book tourism products, as individuals may now communicate directly with tourism service providers. (Buhalis and Law, 2008). New technologies make tourism services more accessible by providing customer-friendly services. If tourism units utilised websites to promote their products and services in the past, they now use them to attract clients and offer them the option of booking services directly online without the use of other intermediaries.

Tourists are increasingly booking tourism services online, which has become one of the most important distribution channels.Tie-up with other sectors of the industry or intermediaries necessitates tourism units paying high commission fees for intermediation, which can result in lower revenues in some cases. (Gazzoli et al., 2008; Thakran and Verma, 2013; Lei et al., 2019).Travelers' purchasing and travel decisions were influenced directly by tourism-related businesses and their online marketing communications, as well as indirectly by other important elements such as online PR, influencers, bloggers, and vloggers, and online word of mouth.

Literature Review

The use of Internet technology by tourism businesses was the focus of some of the early studies in this area. Tourism firms such as tour operators, hotels, and destination marketing groups were interviewed or surveyed as part of the research. (Siguaw, Enz, & Namasivayam, 2000; Yuan, Gretzel, & Fesenmaier, 2003).Some other studies that addressed varied aspects of operations in the context of web-

based tourism services are: international access operations (Nedelea & Balan, 2010), e-travel market problems (Oorni & Klein, 2003), effectiveness of e-tourism operations in the generation of customer satisfaction through value addition (Qirici, Theodhori, & Elmazi, 2011), benefits of value-added services offered through tourism websites (Buhalis & O'Connor, 2005), and the role of websites in generating visitors' interest (Skadberg, Y. X., Skadberg, & Kimmel, 2005).

Benckendorff, P (2006) investigated the preferences of airline passengers from Australia and New Zealand for various content features on airline websites, suggesting that airline website attributes can be classified into at least seven categories. Customers consider the fundamental "look and book" qualities to be the most significant of these.Guang and Jian (2021) has found that transaction cost has great influence on the hotel's operational decision and booking through online travel agency can induce customers to choose the option with the lowest transaction cost.Lorenzo M (2020) studied into strategic consumer behaviour in online hotel booking and observed that risk-averse consumers prefer a free cancellation rate, which increases when an automatic rebooking service is available. Although a longer booking window enhances the utility of the free cancellation rate, as risk propensity rises, this effect reduces.

Hotel management may suffer major consequences as a result of a rise in online bookings and last-minute cancellations. Building a quantitative revenue management strategy for online hotel booking systems that incorporates overbooking strategies is critical. Taiga (2019) developed a quantitative overbooking model for online booking systems using data from online bookings to estimate customers' choosing behaviours.From the perspective of Lithuanian tourist users, Daiva et al. (2020) investigated the possible improvements of e-marketing in the tourism business. Their results indicate that the e-marketing tools they utilise are effective, even if some methods aren't completely operational or aren't used at all.After analysing 258 Chinese tourist websites with a content analysis technique, Kaijun and Zhaoping (2016) showed that there are considerable disparities in performance between the categories of websites, and online travel agencies (OTAs) doing better than other types of tourism websites. The findings also revealed that these websites are not taking significant advantage of the Internet.

According to Buhalis and O'Connor (2005), the future of e-Tourism will be focused on consumer-centric technologies to ensure that the new sophisticated and experienced consumers are served.Davis' (1989) technology acceptance model examines and predicts an individual's attitude toward the acceptance and application of technology. The theory identifies perceived usefulness and perceived ease of use as technology adoption determinants.Expected consumer problems in Internet travel bookings, according to Anckar and Walden (2002), include increased time requirements, complexities in price comparisons, limited industry knowledge, limited usability of websites, difficulties in locating service provider websites, technical issues, and availability of hotel rooms and flights.

Objectives of the study

Any insight into how consumers make decisions in the internet world could be crucial to a company's success. In this context, the aim of this study is to analyse the perceived advantages of e-booking in different sectors of the tourism industry in Kerala.For this a set of perceived advantages have been identified such as: increased speed of service, 24hour operation, lower information distribution service, save personnel cost, increased sales turnover, provide customers with lower prices, improve service quality and easy cancellation and refund.

Hypothesis

H_0: There is no significant difference in individual perceived advantages of e-booking on the nature of business.

Methodology

This study analyses and examines the perceived advantages of e-booking facility provided by different categories of business units in the tourism industry of Kerala, India. The study was an empirical one based on the survey method. Both primary and secondary data were used for this study.Primary data was

collected from 775 tourism business unitsusing structured interview schedules for the different business units of the various sectors of the industry.The interview schedule aims to obtain information on the perceived advantages of e-booking in the tourism industry in Kerala. Table 1 gives the detailed information regarding the sample design.

Tourism sector	Subdivisions	Population (Registered units)	Sample size(at 90% confidential level)
Accommodation sector	Hotels and resorts	1475	229
	Home stays	600	187
Attraction sector	Houseboat operators	715	197
	Ayurveda centres	156	100
Travel organisation sector	Tour operators and travel agents	80	62
Total		**3026**	**775**

Table 1 - Sample design

Study area and Data Collection

The field of the current study is the various registered business units in different sectors of the tourism industry in the state of Kerala in India.A pilot survey was conducted with a sample of 25 units to test the interview schedule one month ahead of the data collection. The data was gathered with the interview schedule over a period of one year from March 2018 to February 2019, covering all the tourist seasons. The sample selected statistically well represents the population of the respondents. The survey data were analysed using the Statistical Package for the Social Science (SPSS).

Results and Discussion

Individual and institutional consumers can now book directly on the internet, revolutionising tourist distribution systems. Table 2 shows the access to e-booking facility by the respondents.

e-booking facility	Frequency	Percent	Cumulative Percent
Yes	562	72.5	72.5
No	213	27.5	100.0
Total	775	100.0	

Source: Primary data

Table 2 - e-booking facility

A vast majority of the respondents are having e-booking facility in their organisation (72.5 per cent), whereas 27.5 per cent of the respondents are still not having access to the e-booking facility.

a. Nature of business-wise e-booking facilities

Table 3 shows the comparison of e-booking facility within the category of business and to the total respondents. In the case of access to e-booking facility, Ayurveda centres are prominent with 98 per cent access to the facility. Hotels and resorts are having least access to e-booking facility compared to other categories of business units (63.3 per cent) closely followed by Homestays with 64.2 per cent access to e-booking facility.

		e-booking facility		Total
		Yes	No	
Hotels & Resorts	Count	145	84	229
	% within Hotels & Resorts	63.3%	36.7%	100.0%
	% within e-booking facility	25.8%	39.4%	29.5%
	% of Total	18.7%	10.8%	29.5%
Homestays	Count	120	67	187
	% within Homestays	64.2%	35.8%	100.0%

	% within e-booking facility	21.4%	31.5%	24.1%
	% of Total	15.5%	8.6%	24.1%
Houseboat	Count	153	44	197
	% within Houseboat	77.7%	22.3%	100.0%
	% within e-booking facility	27.2%	20.7%	25.4%
	% of Total	19.7%	5.7%	25.4%
Ayurveda center	Count	98	2	100
	% within Ayurveda center	98.0%	2.0%	100.0%
	% within e-booking facility	17.4%	.9%	12.9%
	% of Total	12.6%	.3%	12.9%
Travel agent / Tour organiser	Count	46	16	62
	% within Travel agent / Tour organiser	74.2%	25.8%	100.0%
	% within e-booking facility	8.2%	7.5%	8.0%
	% of Total	5.9%	2.1%	8.0%
Total	Count	562	213	775
	% within Nature	72.5%	27.5%	100.0%
	% within e-booking facility	100.0%	100.0%	100.0%
	% of Total	72.5%	27.5%	100.0%

Source: Compiled from primary data

Table 3 - Nature of business Vs e-booking facility – Cross Tabulation

b. Advantages of using e-booking facility

The 5-point scales responses obtained on perceived advantages of using e-booking facility were initially analysed with nature of business as fixed factor. The significant differences, if any that exists across Hotels & Resorts, Homestays, Houseboats, Ayurveda centres and Travel agent/ Tour organiser were tested for the overall combined awareness using MANOVA and awareness of individual terms using ANOVA. The descriptive statistics of the dependent variables with respect to each of the independent variables namely categories of nature ofbusiness are shown in Table 4.

		Mean	Std. Dev	N
Increased speed of service	Hotels & Resorts	4.24	.739	145
	Homestays	4.17	.823	120
	Houseboat	4.33	.778	153
	Ayurveda center	4.85	.415	98
	Travel agent / Tour organiser	4.48	.505	46
	Total	4.38	.743	562
24 x 7 operation	Hotels & Resorts	4.03	.877	145
	Homestays	3.94	.892	120
	Houseboat	4.20	.861	153
	Ayurveda center	4.73	.529	98
	Travel agent / Tour organiser	4.33	.474	46
	Total	4.21	.840	562
Lower information distribution service	Hotels & Resorts	3.90	.758	145
	Homestays	3.88	.747	120
	Houseboat	4.10	.812	153
	Ayurveda center	4.76	.478	98
	Travel agent / Tour organiser	3.96	.595	46
	Total	4.11	.780	562
Save personnel cost	Hotels & Resorts	3.89	.973	145
	Homestays	3.60	1.095	120
	Houseboat	3.92	1.019	153
	Ayurveda center	4.47	.560	98

	Travel agent / Tour organiser or	4.02	.577	46
	Total	3.95	.967	562
Increased sales turnover	Hotels & Resorts	3.92	.809	145
	Homestays	3.84	.756	120
	Houseboat	4.16	.836	153
	Ayurveda center	4.74	.504	98
	Travel agent / Tour organiser	3.70	.511	46
	Total	4.09	.808	562
Provide customers with lower prices	Hotels & Resorts	3.93	.984	145
	Homestays	3.83	.901	120
	Houseboat	4.12	.883	153
	Ayurveda center	3.41	.983	98
	Travel agent / Tour organiser	3.54	.780	46
	Total	3.84	.955	562
Improve service quality	Hotels & Resorts	4.39	.627	145
	Homestays	4.37	.579	120
	Houseboat	4.44	.648	153
	Ayurveda center	2.13	1.052	98
	Travel agent / Tour organiser	4.17	.383	46
	Total	3.99	1.106	562
Easy cancellation and refund	Hotels & Resorts	3.90	.948	145
	Homestays	3.81	.946	120
	Houseboat	4.17	.916	153
	Ayurveda center	4.31	.582	98
	Travel agent / Tour organiser	3.85	.698	46
	Total	4.02	.884	562

Table 4 - Advantages of using e-booking facility - Descriptive Statistics

All the constructs of advantages of e-booking, except 'Improved service quality' were prominent in the case of Ayurveda centres (Mean 2.13 ± 1.052), as indicated by the higher means. The lowest mean was observed among Homestays (Mean 3.60 ± 1.095) comparing to other categories of business in case of 'saving personnel cost'.A one-way multivariate analysis of variance was run to determine the level of agreement of nature of business on constructs of perceived advantages of using e-booking facility and the combined effect of all the eight constructs of perceived advantages of using e-booking facility is shown as MANOVA results in Table 5.

	Value	F	Hypothesis df	Error df	Sig.
Wilks' lambda	.190	36.014	32.000	2029.895	**0.000**

Each F tests the multivariate effect of Nature of business
Figure in bold indicates significant at 5% level.

Table 5 - MANOVA Results

The differences between the nature of business on the combined dependent variables of perceived advantages of using e-booking facility was statistically significant, $p<0.05$; Wilks' $\Lambda = .190$ and $F=36.014$. It is inferred that when all the test variables are considered as a whole, significant difference exists across categories of nature of business.

Follow-up univariate ANOVAs was made for each of the eight dependent variables to identify whether statistically significant differences exist between the categories of nature of business. The results of univariate tests in terms of estimated Means, Standard Errors and ANOVA test results are depicted in Table 6.

Dependent Variable	Nature of Business	Mean	Std. Error	Hyp df (Error df)	F	Sig
Increased	Hotels & Resorts	4.241	.059	4 (557)	15.141	**0.000**

speed of service	Homestays	4.167	.065			
	Houseboat	4.333	.057			
	Ayurveda center	4.847	.072			
	Travel agent / Tour organiser	4.478	.104			
24 x 7 operation	Hotels & Resorts	4.034	.066	4 (557)	15.952	**0.000**
	Homestays	3.942	.073			
	Houseboat	4.203	.065			
	Ayurveda center	4.735	.081			
	Travel agent / Tour organizer sector	4.326	.118			
Lower information distribution service	Hotels & Resorts	3.903	.060	4 (557)	26.271	**0.000**
	Homestays	3.883	.066			
	Houseboat	4.105	.058			
	Ayurveda center	4.755	.073			
	Travel agent / Tour organizer sector	3.957	.106			
Save personnel cost	Hotels & Resorts	3.890	.077	4 (557)	12.150	**0.000**
	Homestays	3.600	.085			
	Houseboat	3.915	.075			
	Ayurveda center	4.469	.094			
	Travel agent / Tour organizer sector	4.022	.137			
Increased sales turnover	Hotels & Resorts	3.924	.061	4 (557)	27.986	**0.000**
	Homestays	3.842	.068			
	Houseboat	4.157	.060			
	Ayurveda center	4.745	.075			
	Travel agent / Tour organizer sector	3.696	.109			
Provide customers with lower prices	Hotels & Resorts	3.931	.077	4 (557)	10.504	**0.000**
	Homestays	3.833	.084			
	Houseboat	4.124	.075			
	Ayurveda center	3.408	.093			
	Travel agent / Tour organizer sector	3.543	.136			
Improve service quality	Hotels & Resorts	4.393	.058	4 (557)	209.196	**0.000**
	Homestays	4.367	.064			
	Houseboat	4.444	.057			
	Ayurveda center	2.133	.071			
	Travel agent / Tour organizer sector	4.174	.103			
Easy cancellation and refund	Hotels & Resorts	3.897	.072	4 (557)	6.794	**0.000**
	Homestays	3.808	.079			
	Houseboat	4.170	.070			
	Ayurveda center	4.306	.088			
	Travel agent / Tour organizer sector	3.848	.128			

Table 6 - EMM, SE and ANOVA Test Results

The following null hypothesis was tested:

H_0: There is no significant difference in individual constructs measuring level of perceived advantages of using e-booking facility across categories of nature of business.

The follow-up univariate ANOVAs showed that all the constructs measuring level of perceived advantages of using e-booking facility were statistically significantly different across categories of nature of business. This leads to the inference that there is significant difference between Hotels & Resorts, Homestays, Houseboats, Ayurveda centres and Travel agent/ Tour organiser in level of perceived advantages of using e-booking facility. The null hypothesis stated above gets rejected, at 5 per cent significance level, in all the cases, since the p value of F statistics falls below 0.05.

Conclusion

With its intangible products and services, the tourism business is ideally suited to Internet marketing. The results of this study highlight the elements that impact future online booking portals, such as perceived benefits of e-booking from various kinds of tourism units. As a result, we believe that the deployment of Industry 4.0 technologies will improve the convenience of e-booking. Tourism businesses that do not take advantage of this new potential will be at a significant disadvantage in the near future.

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INDUSTRIAL INFRASTRUCTURE DEVELOPMENT PROGRAMME AND PROMOTION OF SMALL-SCALE INDUSTRIES IN ASSAM

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ABSTRACT

Small scale industry flourishes the growth of industrial pace. Small scale industry can make people realize zeal towards entrepreneur. An attempt was made to examine the role of Assam Industrial Infrastructure Development Corporation in promotion of Small-scale industries infrastructure. Industrial infrastructure includes Industrial Estate, Industrial area, Mini industrial Estate, Integrated Infrastructure development centre etc. build by Assam Industrial Infrastructure Development Corporation in the state. A research enquiry was done in 105 Small scale industries located in Industrial Infrastructure situated in the Kamrup (Metro) and the Kamrul (Rural) district of Assam. It was found that Entrepreneurs are influenced by Land and constructed factory Sheds for setting up small industries and attracted towards availability of power and easy access to finance.

Keyword: *Industrial infrastructure, Assam Industrial Infrastructure Development Corporation, Industrial Estate, Entrepreneurs.*

Introduction

Industrialization is essence mechanism for a development of Indian economy. Country's socio-economic growth depends on planned structural design of industry. Development of small-scale industry was considered as a pillar of industrial policy. Being labour-intensive small-scale industry can make optimum resource utilization.Small scale industries are vibrant and dynamic sector for economy of India. Central and state government has introduced various policies for strengthening small scale industry in India. Growth of small-scale industries can be accelerated through industrial infrastructure such as industrial estate, industrial area, mini-industrial estate etc. MSME provides second largest employment after agriculture in India.

The Micro Small and Medium Enterprises Development Act, 2006 has been introduced and abolished the concept of reserved items for manufacturing in small scale industry. Enlarging the scope of MSME as a part of Aatmanirbhar Bharat Abhiyaan on 13th May, 2020 the concept of MSME redefined by the government and the differences between manufacturing and servicing enterprises diluted. (msme.gov.in).

Definition of Small-Scale Enterprises-

Revised MSME Classification (2020)			
Criteria –Investment and Annual Turnover			
Classification	**Micro**	**Small**	**Medium**
Manufacturing & Service Enterprise	Investment <Rs 1 Cr and Turnover <Rs 5 Cr	Investment <Rs 10 Cr and Turnover <Rs 50 Cr	Investment <Rs 50 Cr and Turnover< Rs 250 Cr

Source: msme.gov.in

Theindustrial estate Programme was launched in India in 1952 for growth of the small-scale enterprises. The Programme promotes creation, expansion and upgradation of small-scale enterprises by providing accommodation of factory, common service facility and encourage regional balance development. Various infrastructure facilities such as water, transport, electricity, bank, post office, drainage, and technical guidance are facilitated for promoting of entrepreneurs under government sponsored industrial infrastructure.

Review of literature

Nagaraja B and Anitha H.S (2018) "Studied the role of Industrial infrastructure estates programmes in promotion of micro small and medium enterprises in Davangiri Zone. It was found that the power supply is excellent in the estates and the quality of building is moderately in good position. Other

infrastructure such as railway connectivity and internal Roads and transportation found to be poor. The researcher conclude that Government agencies play important role in facilitating infrastructure for industrialization in Indian economy.

Selvaraj N (2016) studied the role of Industrial Estates in enhancing performance of Entrepreneurs in Southern districts of Tamil Nadu. It was found that better performing entrepreneur found lack of innovation and high credit sales as highly perceived problem. The less perceived problem for good performer was limited demand and lack of network. The researcher suggested that performance level of entrepreneurs can be increased by increasing managerial skill and by providing necessary industrial infrastructure. It was observed that entrepreneurs background had little connection with success.

Poornima M. Charantimath (2014) studied role of clusters in promoting MSMEs and the United Nations Industrial Development Organization's initiative for cluster development in India. The researcher found that cluster provides economies of scale for competitive advantage by promoting higher productivity.

Ayozie D. Ogechukwu, et al, (2013) studied the role of Nigeria government in historical development of Small and Medium Enterprises. The researchers emphasized on importance of marketing for growth and survival of enterprises. The study also explores the importance of manpower development, provision for enactment of supportive law, infrastructural facilities, establishment of financial institution for survival of enterprises.

Tulu Tambunan (2009) observed in variation of development of Small and Medium Enterprises with degree of development of economy of member country of ASEAN. The researcher studied foreign direct investment, export competitiveness, innovation, cluster and supporting industries and development of Small and Medium Enterprises in ASEAN countries. It was found that higher the per capita income, lower the share of Small Medium Enterprises in light manufacturing than heavy industries.

Many researchers have conducted various studies on small scale industry and its importance on national economy. Though number of studies has been undertaken on the working of industrial infrastructure and on the small industries problems but, no study has been made on small scale industry under government sponsored industrial infrastructure in the state of Assam. The study will highlight the importance of industrial infrastructure for growth of small-scale entrepreneurs in Kamrup (Metro) and Kamrup (Rural). The study will also analyze the motivating factors of small entrepreneurs to set up enterprises under government sponsored industrial infrastructure.

Objectives

Following are the objectives of the study-

1. To study the overview of industrial infrastructure in Kamrup districts of Assam.
2. To study the factors influencing entrepreneurs to set up industries under industrial infrastructure.

Research Questions

Following are the research queries for the study-

1) Whether Assam Industrial Infrastructure Development Corporation is promoting Small Scale enterprises under industry infrastructure?

2) Whether Entrepreneurs are influenced with any factors to set up industries under Industrial Infrastructure?

Research Methodology

Area of the Study: The researcher conducted the study in Kamrup (metro) and Kamrup (Rural) as the district has highest numbers of sheds in the state.

Universe of the study: The universe of the study is small scale industry under industrial infrastructureofAssamIndustrialInfrastructure Development Corporation.

Population size: The population size of the universe is 143.

Sample size: The researcher has applied Taro Yamane formula and the size of the sample is

n =N/1+N*(e)2

=143/1+143*(.05)2

=105.33 (after rounding 105)

=105

Sampling frame: The list of small-scale industry collected from Assam Industrial Infrastructure Development Corporation and

Assam Statistical Handbook from 2014-15 to 2018-19 is the sampling frame.

Sampling technique: The researcher has applied stratified random sampling technique.

Industrial infrastructure	Total units functioning	Population (no of SSI)	Sample Respondents
Industrial Estate	73	45	33
Mini Industrial Estate	31	15	11
Industrial Growth Centre, Jambari	31	23	17
Industrial Growth Centre, Patgaon	31	5	4
Integrated Infrastructure Development Centre, Rangia	19	17	12
Industrial Area, Rani	146	38	28
Total	**331**	**143**	**105**

Role of Assam Industrial Infrastructure Development Corporation in promotion of infrastructure

For orderly growth and development of industrial infrastructure in Assam, Assam Industrial Infrastructure Development Corporation was established in 1997, June7th pursuant to the provision of Assam Industrial Infrastructure Development Corporation Act 1990. The corporation has been started with the objective of assisting establishment and management of enterprises under industrial infrastructure such as industrial estate, growth centre, industrial area, mini-industrial estate etc. The mission of the corporation is to create industrial infrastructure and to maintain the quality of existing industrial infrastructure for betterment. The industrial infrastructure includes constructed sheds, developed plots, power supply, water supply, communication and transportation facility, common utility services, security services etc. The corporation specially provides sheds and land at concessional rate on lease and rent,which is a major reason for setting up industries under the industrial infrastructure. There is long time gap between development of sheds and allotment of sheds which has reduced the efficacy. Assam Industrial Infrastructure Development Corporation should draft plan to reduce time gap.The small-scale enterprises under industrial infrastructure are influenced by the infrastructure provided by Assam Industrial Infrastructure Development Corporation. Small scale units are manufacturing units and the ownership pattern is mainly sole trading followed by partnership. The number of industrial infrastructures is increasing in the last five years. Assam Industrial Infrastructure Development Corporation facilitates the developed land and constructed at lower rate. But, along with this infrastructure the entrepreneurs also need other infrastructure such as power, communication, transportation, raw materials and common utility services at subsidized rate. Availability of raw material is one of the most important factors for choosing location of the units. Availability of raw material helps in optimum utilization of various resources. It was found that units must purchase raw materials of its own, in some cases units have to purchase from other States and Countries as well. Industrial infrastructure has influenced the entrepreneurs for setting up the enterprises. The facility providedunder the industrial infrastructure has reduced the setting up cost for the enterprises which is a major hindrance of growth of new entrepreneurs. The institution is performing the role of facilitator for industrial growth throughout the state. Assam Industrial Infrastructure Development Corporation has taken various programmesfor development and maintenance of existing infrastructure for promotion of entrepreneurship and to attract the investors for growth and prosper of industries. Raw Material should be available in right Price and in right quantity from right sources. Assam Industrial Infrastructure Development Corporation should establish its own raw material depot in Industrial infrastructure for procurement and distribution of raw materials. There should be proper warehouse for storage of goods in proper manner. Emphasis should be given on setting up of material testing Centre and quality control Centre so that units can manufacture quality product and need not to face hassle in

testing material and checking quality. Small Entrepreneur should be equipped with sound management Principles and Techniques. The organization or policy implementing Agency should conduct Entrepreneurship Development Programme or cash and subsidized programmes for promoting small Entrepreneurs for setting units

.

Industrial Infrastructure	2015-16				2016-17				2017-18				2018-19			
	Numbers	Total area	Total sheds	Functioning unit	Numbers	Total area	Total sheds	Functioning unit	Numbers	Total area	Total sheds	Functioning unit	Numbers	Total area	Total sheds	Functioning unit
Industrial Estate	21	2064429.81	343	293	22	1283525.40	355	299	24	1270813.64	315	259	24	1622269.9	369	299
Industrial Area	17	2158661.56	167	229	20	3118671.48	170	232	21	2598246.44	160	229	21	2249565.3	173	229
EPIP	1	275834.00	3	47	1	275586.00	3	42	1	275586.00	3	7	1	275628	3	7
Food Park	2	363042.00	8	9	3	533003.82	2	11	3	506225.82	0	13	3	532990.82	8	14
IID	11	1601452.70	11	44	11	1601510.09	11	61	11	1602110.09	11	71	11	1643795.9	7	63
Mini industrial estate	8	49963.94	80	45	7	46658.29	77	54	7	47756.09	77	48	7	52284	79	47

Table 1

Industrial Infrastructure in Assam- [In terms of Number, total area (Sq. Mtr.), total sheds and functioning units]

Source – Statistical Handbooks of Assam from 2016-2019.

Results And Discussion

It is showing that the industrial infrastructure is increasing in Assam from2015-16to 2018-19.The industrial estate has been increasing from 21 (2015-16) to 24(2018-19).Industrial area has been increased from 17(2015-16) to 21 (2018-19), Export Promotion. Industrial Park has been remained constant in the years; Food Park has been increasedfrom 2(2015-16) to 3 (2018-19), Integrated Infrastructure Development centrehas remained constant in the years and Mini Industrial Estates has been reduced7 (2018-19) from 8(2015-16) as there was non-availability of functioning units in Barpeta. The total area forindustrial estate was 2064429.8 Sq. Mtr. in 2015-16 and in 2018-19 it was 1622269.9 Sq. Mtr.For industrial Area it was 2158661.5 Sq. Mtr.in 2015-16 and in 2018-19 it was 2249565.3 Sq. Mtr.For Export Promotion Industrial Park, the area was275834.00 Sq.Mtr. In 2015-16and in 2018-19it was 275628.00 Sq.Mtr. For integrated infrastructure development centre, the area in 2015-16was 1601452.70 Sq. Mtr to 1643795.9 Sq. Mtr. In 2015-16, the area for mini-industrial estatewas 49963.94 Sq. Mtrto 52284 Sq. Mtr. The no.of unit sunder industrial estate are293(2015-16),299(2016-17),259(2017-18),299(2018-19). The units under industrial area are 229(2015-16),232(2016-17),229(2017-18),229(2018-19). The units are Export Promotion Industrial Parkare 47(2015-

16),42(2016-17),7(2017-18), 7 (2018-19).The units under Food Park are 9(2015-16,11(2016-17),13(2017-18), 14(2018-19)The units under Integrated InfrastructureDevelopment are 44(2015-16),61)106-17),71(2017-18),63(2018-19) and the units under Mini industrial estates are45(2015-16), 54(2016-17),48(2017-18),47(2018-19).

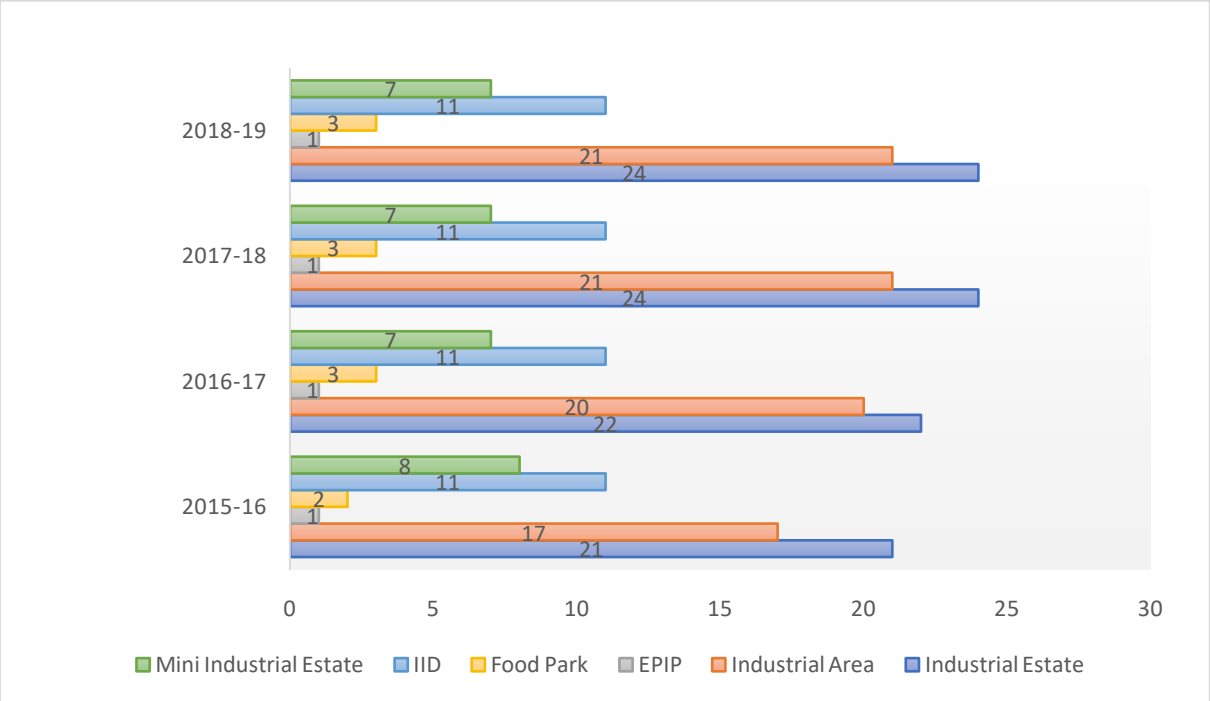


Diagram 1

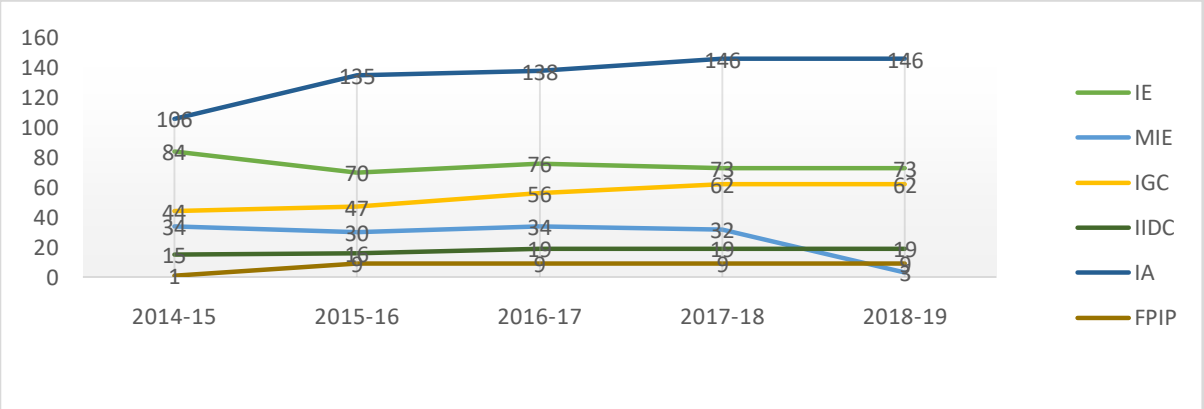
It showing that the number of industrial infrastructures is increasing from 2015-16to 2018-19.The industrial estate has been increasing from 21 (2015-16) to 24(2018-19).Industrial area has been increased from 17(2015-16) to 21 (2018-19), Export PromotionIndustrial Park has been remained constant in the years; Food Park has been increased from2(2015-16) to 3 (2018-19), Integrated Infrastructure Development centre has remainedconstant in the years and Mini Industrial Estates has been reduced to 7(2018-19) from 8(2015-16) as there was non-availability of functioning units.

Table 2: No of units functioning under Industrial Infrastructure in Kamrup (M) and Kamrup (R)

Industrial Infrastructure	2014-15	2015-16	2016-17	2017-18	2018-19
IndustrialEstate(Bamunimaidam)	84	70	76	73	73
MiniIndustrialEstate(Kalapahar)	34	30	34	32	31
Industrialgrowthcentre(Chaygaon/Patgaon)	44	47	56	62	62
Integrated infrastructure development centre(Rangia)	15	16	19	19	19
Industrial Area	106	135	138	146	146
Food processing industrial park(Chaygaon)	1	9	9	9	9

Source: NEDFI handbook and Directorate of Economics & Statistics, Statistical Handbook Assam 2015 to 2020, Government of Assam.

Diagram- 2



It showing an upward trend for number of units functioning under industrial infrastructure in Kamrup (M) and Kamrup(R). The number of unites under industrial estate has been reduced by 3 units in 2017-18 as they have shifted to other industrial infrastructure. In the same way units under mini-Industrial estate has been reduced by one two number in 2017-18 and in one number in 2018-19 as they also been shifted to other industrial Infrastructure.

Factors influencing entrepreneurs to set up under industrial infrastructure

Factor Analysis

Table 3: KMO and Bartlett's Test

Kaiser-Meyer- Olkin Measure of Sampling Adequacy.	**0.642**
Bartlett's Test of Sphericity Approx. Chi-Square	
Df	**28**
Sig.	**.000**

Bartlett's test found significant; a more discriminating index of factor analyse ability is the KMO. For this data set, it is **0.642**, which is large,so the KMO supports factor analysis for the observed statements.

Table 4 Communalities

	Initial	**Extraction**
Land	1.000	.602
Factory shed	1.000	.478
Raw Material	1.000	.275
Transportation	1.000	.478
Market proximity	1.000	.564
Economical in setting	1.000	.395
New market opportunity	1.000	.360
Common facility	1.000	.724

Principal component Analysis was utilized to extract the communalities shown in the above table. The higher the communality, the more reliable it is an indicator, the communality for a variable is the variance accounted for by all the extracted factors.

Table 5 Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.727	34.084	34.084	2.727	34.084	34.084
2	1.148	14.354	48.439	1.148	14.354	48.439
3	.987	12.336	60.775			
4	.903	11.289	72.063			
5	.787	9.840	81.903			
6	.674	8.430	90.333			
7	.460	5.748	96.080			
8	.314	3.920	100.000			

Extraction Method: Principal Component:

According to Kaiser's(1958) stopping rule states that only the number of factors with Eigenvalues over 1.00 should be considered in the analysis. In the above table it shows that two components with an Eigenvalue of 1.0 or greater explain almost 48% of the total variance. Higher percentages of total variance explained is an indicator that a strong relationship exist among a group of variables under study.

Table 6 : Component Matrix[a]

	Component	
	1	2
Land	.766	
Factory shed	.666	
Raw materials	.463	
Transportation	.691	
Market proximity		.668
Economical in setting	.601	
Market opportunity	.502	
Common facility	.523	

Extraction Method: Principal Component Analysis:

Two components extracted.

According to Comrey& Lee, (1992) it is generally accepted that loading should be.30 or greater to provide any interpretive value. A loading is simply the Pearson correlation between the variables and the extracted component. The greater the loading, the more the variable is a strong measure of the components. In component one, land(.766), transportation(.691), factory shed(.666), economical in setting(.601),common facility(.523), market opportunity(.502), raw materials (.463) are correlated. In component two market proximity(.668) is not related with other variables.

Availability of infrastructure under industrial infrastructure

Factor Analysis:

Table 7: KMO and Bartlett's Test
Important Infrastructure Facilities to set-up enterprise

Infrastructure Facilities	
Kaiser-Meyer-Olkin's Test(KMO)	.677
Bartlett's Test of SphericityApprox. Chi – Square Df Sig	263.706 66 .000

In above table Bartlett's test found significant, a more discriminating index of factor analysability is the KMO. For this data set, it is **.677**, which is large, so the KMO supports factor analysis for the observed statements.

Table 8: Important Infrastructure Facilities

	N	**Minimum**	**Maximum**	**Mean**
1.Developed plot	105	3	5	4.61
2.Constructed factory shed/building	105	3	5	4.55
3.Power	105	3	5	4.77
4.Roads	105	3	5	4.00
5.Water Supply	105	2	5	3.53
6.Communication	105	1	5	4.14
7.Pollution control measures	105	2	5	3.30
8.Marketing services	105	2	5	3.71
9.Warehousing facility	105	2	5	3.08
10.Security service	105	2	5	2.36
11.Common Amenities	105	2	5	2.89
12. Finance	105	3	5	4.84

The above table shows that finance is the most important infrastructure followed by power. Security service is less important for establishing units under industrial infrastructure. The study found that most of the entrepreneurs are influenced by developed land, factory sheds and location of the infrastructure. The developed sheds will strengthen and increase profits. The study shows there is more demand for plot than constructed shed as the Entrepreneurs prefer to develop own sheds as per their requirement. For setting up enterprises industrial infrastructure is a factor and power and finance are found to be the most important. There is inadequate warehousing facility for raw materials and finished goods. The Study found that many Entrepreneurs store in congested area or open space.

Principal Components Analysis was utilized to extract the communalities shown in Table below. The higher the communality, the more reliable it is an indicator. The communality for a variable is the variance accounted for by all the extracted factors.

Table 9

Communalities		
	Initial	**Extraction**
1.Developed plot	1.000	.509
2.Constructed factory shed/building	1.000	.564
3.Power	1.000	.712
4.Roads	1.000	.663
5.Water Supply	1.000	.648
6.Communication	1.000	.637
7.Pollution control measures	1.000	.428
8.Marketing services	1.000	.490
9.Warehousing facility	1.000	.661
10.Security service	1.000	.689
11.Common Amenities	1.000	.582
12. Finance	1.000	.702
Extraction Method: Principal Component Analysis.		

Table 10

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.696	22.469	22.469	2.696	22.469	22.469
2	2.257	18.808	41.276	2.257	18.808	41.276
3	1.199	9.994	51.270	1.199	9.994	51.270
4	1.134	9.450	60.720	1.134	9.450	60.720
5	.899	7.491	68.211			
6	.835	6.955	75.166			
7	.672	5.602	80.767			
8	.655	5.462	86.229			
9	.562	4.685	90.914			
10	.437	3.646	94.560			
11	.376	3.136	97.696			
12	.277	2.304	100.000			
Extraction Method: Principal Component Analysis.						

According to Kaiser's (1958) stopping rule states that only the number of factors with Eigenvalues over 1.00 should be considered in the analysis.

In above table it shows that four components with an Eigenvalue of 1.0 or greater explain almost 61% of the total variance. Higher percentages of total variance explained is an indicator that a strong relationship exists among a group of variables under study.

Table 11

Component Matrix[a]				
	Component			
	1	2	3	4
1.Developed plot			.609	
2.Constructed factory shed/building	.649			
3.Power	.812			
4.Roads	.586			
5.Water Supply		.		.643
6.Communication				.605
7.Pollution control measures		.648		
8.Marketing services	.674			
9.Warehousing facility		.713		
10.Security service		.808		
11.Common Amenities		.604		
12. Finance	.777			
Extraction Method: Principal Component Analysis.				
a. 4 components extracted.				

According to Comrey & Lee, (1992) It is generally accepted that loadings should be .30 or greater to provide any interpretive value. A loading is simply the Pearson correlation between the variables and the extracted component. The greater the loading, the more the variable is a strong measure of the components. Component one contained the 41.7% of (5) infrastructures out of total important infrastructures. In component two, 4 infrastructures representing 33.3% of the total variables third component have only one variable and in component four two variables are representing out of total variables.

In Component one, Power (.812) Finance (.777), Marketing service (.674), Constructed factory shed/building (.649) and Roads (.586) have higher relational link with the other infrastructure facilities respectively. In Component two, Security Service, Warehousing facility, Pollution control measures and Common amenities are correlated with the other facilities respectively. Developed plot is not correlating with the other variables while Water supply and Communication facilities as infrastructural facilities have correlation.

Conclusions

Small Scale Enterprises plays an important role in development of industry for developing the economy. There is a direct relationship between growth of small-scale industries and Infrastructure. Assam Industrial Infrastructure Development Corporation is playing a role of incubator by developing infrastructure for small scale industries Entrepreneurs for continuous growth & prosperity. The units under industrial infrastructure are more efficient and have better performance though there is demand for Industrial Infrastructure as it is providing various infrastructure at concessional and lower costs. Government should emphasize on proper drafting of plans for more prosperity. Red tapism and lack of personal interest in the Administration of attitude must be change for reducing dissatisfied among Entrepreneurs. There Should be proper interaction among multi-dimensional agency like warehousing corporation, water Board, Assam Power distribution company limited, District Industry Centre, Assam small industries development corporation limited etc for generating growth.

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ACCESSIBLE MANAGEMENT INFORMATION SYSTEM (MIS) TECHNOLOGIES ON INSURANCE INDUSTRY IN INDIA

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ABSTRACT

The study provides a detailed description about the importance and contribution of information technology in the development of Insurance Industry. Financial intervention and financial maintenance are the key factors deciding the position of any sector in present competitive market. Since most of the sectors deal with massive data there is a significant need of technology support in compilation and maintenance of such records. Though insurance industry is lacking in its technical aspects, other sectors such as finance sectors, stock markets and credit markets are well versed in using technical interventions. At present the insurance sector is facing a huge demand for its traditional products such as life insurance, insurance against cybercrime, health insurance, motor insurance, property insurance and retirement based insurance which has led to anecessary breakthrough for technology and management information systems. This article is all about identifying a probable variant of systematic business proceedings within the MIS of the respective insurance industry.

Keywords: *Technology, customer support, security, service quality and economic viability.*

Introduction

A company can successfully compete in today's financial market, only when the information technology is properly utilized by them. Their use enables the insurance firm to recruit new consumers, save expenses, and do more accurate actuarial accounting. The primary reason for switching from one insurer to another is the cost of the insurance world would be unimaginable without technical solutions, those insurance businesses that have the opportunity to expand their use of information systems alone can prosper.The research of the key directions in the application of information technologies in the insurance sector is presented in this work. It also lays out a proposed method for the insurer's business processes to be interconnected within the insurance company's information system.

Review Of Literature

Ching-Chang Lee, Kenneth Cheng & Hui-Hsin Cheng (2007) in their research findings, highlighted that the PDA mobile commerce solution is appropriate for the insurance industry. When it comes to the development of customized variations, they found that job experience, learning ability, and e - learning self are all important variables that determine the suitability of using PDA computing for insurance activities. Other demographic characteristics, such as gender and age, were revealed to be non-significant, contrary to popular belief. They also discovered that PDA information devices offers the maximum degree of support in post-contract customer support, accompanied by hiring new insurance contracts, financial and regulatory data services, among three primary insurance jobs.

G N Kaigorodova, A A Mustafina & D P Alyakina (2018) explained that generally, there are prospects for a technical revolution in the insurance industry and that the traditional insurance products such as property insurance, auto insurance, and health insurance are in high demand. The need for death benefit and technology risk insurance is also steadily increasing, hence they highlighted that the insurance business should effectively employ information systems to execute insurance cover under various contexts. The report also described a potential solution of formalizing the insurer's internal operations within the insurance company's data system.

Alexander Bohnert, Albrecht Fritzsche & Shirley Gregor (2019) found that the insurance businesses have frequently employed digital strategies in their commercial activities as they become more aware of the possibilities for creativity given by digitalization. From 2007 to 2017, they looked at the association between the representation of a digital strategy in financial statements and the financial success of 41 state owned European insurance

businesses. Their results demonstrate a positive association, which is especially evident in instances where organizations take a holistic framework for digital technology, considering it both in the field of internal operations within the company and business influences with clients and stakeholders.

PooraniMithila.S and Dr.B.Menaka (2021) in their research article elaborated the contributions of cloud-based and ai-based technologies to enhance operational competence in insurance industry. They also found that regardless of their collaboration, they provide excellent services to all industries that contribute to the country's economic growth, along with the insurance industry. Even on the worst business day, a firm can prosper if these services are utilized and controlled effectively. It is just as significant to use the services as it is to be aware of the negative consequences. Long-term conventional users will find it more difficult, as they will be subjected to a greater intensity of modifications.

Employees from each unit, each of which is responsible for a specific type of insurance, work in the insurance company's single information system, where all of the data has accumulated.

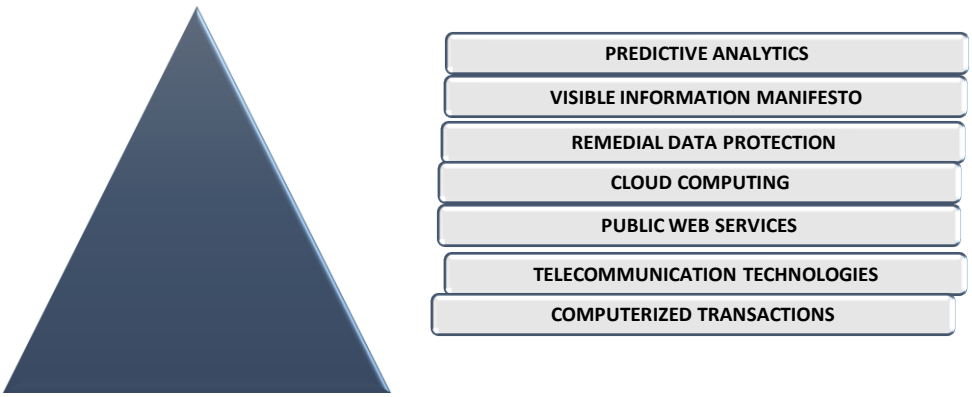
Such a structure is reasonable, but it has a number of flaws, the most significant of which is a conflict of interests among the units, which ultimately leads to a drop in customer service quality.

Following are some of the accessible technologies that must be utilized by the insurance industry.

available application of technologies in insurance industry

In general, insurance firm's information systems are geared at either internal or external users. They do, however, tie the insurer's business operations together.In the context of information systems, researchers look at how the insurer organizes its business processes.

The majority of them agree that it is normal to construct a separate unit that is responsible for sales, underwriting, support, and loss settlement for each type of insurance.



Predictive Analytics

Predictive analytics makes forecasts about an unknown fact, trait, or event using mathematical modelling methods. It's about taking data that you already have and constructing a mathematical model from it. Predictive analysts can now gain a level of understanding that goes beyond a depiction of historical behavior and instead looks ahead at future possibilities by deliberately using the available data. This technology is most widely targeted at the **insurers.** They are frequently tasked with efficiently and persuasively conveying required results to stakeholders. It allows the insurers to offer the correct product to the right customer at the right time, it also helps in enhancing the cross-selling of insurance products and by taking required measures to avoid insurance fraud. Insurance firms with the help of this technology can now estimate whether a new client is a threat based on their age group, past medical information and other factors. They can use this information to form an opinion as to whether or not cover that person.

Visible Information Manifesto

A visible information manifestois a comprehensive solution for receiving,

analyzing, interpreting, and exhibiting data gathered by modern digital organizations' platforms, procedures, and structures. Individual solutions are often difficult to integrate well with one another, despite the fact that today's enterprises can design a network out of hundreds of apps and services to satisfy unique demands. Centralization, an effective barrier that can be used throughout a whole organization, preventing boundaries and giving valuable insights based on a comprehensive framework of the organization's data is one of the numerous advantages of employing a modern data platform. This technology is mostly targeted at **policyholders, clients and partners.** It helps in faster and convenient data access from any place. The technology also allows the creation of a user-friendly unified information environment to allow easy data manifestation. This leads to an increase in the efficiency of performance and involvement of targeted users thus resulting in amplified responsiveness of customer support.

Remedial Data Protection

Privacy, Authenticity, and Resilience are three security standards that are supported by this technology. The term "Remedial Data Protection" refers to a subset of AAA services. Data Protection services are often used to enforce aspects of risk assessment through network security. Data encryption, intrusion detection, and validation are examples of security services. It is supplied by a level of interconnecting communication protocols that provides the platforms' or data flows' access to adequate security. This technology is mostly targeted at **insurers, clients and partners** by providing insurance data protection, initiating trade secrets protection, and implementing consumer information security.

Cloud Computing

The formation of proceedings, arrangement of networks, inventiveness of the human resources and adaptability of many industrial sectors including insurance sector have been revolutionized by cloud competing. Over the years, the number of working personnel has risen in tandem with the methodology and strategies of corporate success. Because their IT rates are likely to rise on a regular basis, the insurance sector incorporates not just to cloud computing advancements but will still be a huge part in the business model. This technology is mostly targeted predominantly at insurers by allowing access to underwriting efficiency, report creation enhancement, and cost reduction in a variety of areas. Recognition and implementation of "Bring Your Own Device" policies, as well as the growing volume of information being released, are driving the development to use new technologies to toughen and ensure their data security.

Public Web Services

A Public Web Service (PWS) is an online tool for connecting with people who share a common interest, history, or real-life relationship. Users of social networking sites build a profile with personalized content, then link with other individuals' profiles. This technology is mostly targeted predominantly at insurers and clients. It offers an extra communication channel, a gradual growth in sales, and an improvement in service quality. The business model of public web services is built on web marketing, either through ad targeting that uses a person's individual information, search preferences, geography, or other similar data, or by marketing private details to third parties. Smartphones and tablets, which are widely available, have aided in the acceptance and use of social media sites. They may assist in the formation and development of ties among persons who have similar career or business connection. They can be used to assist people in finding necessary information, products, services, or resources.

Telecommunication Technologies

The way insurance companies function has altered as a result of advances in telecommunication technology. Because of their flexibility and versatility, insurance telecom solutions have gained popularity**.** It allows for the reduction of insurance contract costs by increasing sales volume, as well as the receiving of a huge amount of data by the insurer in order to develop tariff policy and settle claims.They allow users to file claims for damages immediately, and their corporate

economic output model keeps insurance companies connected to their offices round the clock. Telecommunication technology in the insurance industry is helping to raise the standard for service quality by establishing to be extremely advantageous and accessible for insurance businesses, agents, and customers.Insurance Mobile Solutions are no longer a priority for insurance companies, but instead a requirement to stand out from the competition and provide outstanding client service.

Computerized Transactions

The insurance sector has been highly dependent on printed documents for many years.Increased sales volume leads to lower insurance contract costs as a result of high complexity of the insurance field. Most insurance firms are consistently holding hundreds, if not thousands, of paper records for each of its unique clients, between files of policy initiatives, agreements, claims, and other documentation. An insurance firm might eliminate all of its physical files by computerizing them and organizing them in a clever electronic document organizer. The freed up space could then be put to other uses or eliminated entirely from the company's expenditure sheet.

Document cabinets are similarly ineffective in organizing documents. A health or auto insurance company would have to send someone into the file room to get an outdated customer document. Given the likelihood for material folders or pages to be missing or misfiled, identifying necessary documentation in physical printed documents is almost always difficult and occasionally impossible.

Conclusion

The findings of the study reveal the fact that the insurance business employs a wide range of management information system (MIS) technologies. The tasks that can be solved with the help of such systems have been identified in the article. The use of digital technologies allows insurers to expand the spectrum of risks they may insure, increase market penetration, and improve their economic viability.

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INVESTORS GRATIFICATION TOWARDS EMERGING ONLINE TRADING MOBILE PHONE APPLICATIONS: A STUDY IN TAMILNADU

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ABSTRACT

Investors need for online trading platform in their mobile phones not become neglected, due to the advancement in technology and the effortless handling of mobile phones. Most of the Indian stock brokers have started to provide their online trading platform in the form of mobile application for their clients to meet the competition in their business. This study investigates the investor's gratification towards online trading mobile applications. It also puts forth the factors that influence the investor's gratification towards online trading mobile applications. This study also reveals the major advantages and disadvantages of online trading mobile applications.

Keywords: *Trading Apps, Stock Market, Investors*

Introduction

Technology development steers up all the business sectors to uphold their products and services with innovative ideas. "*Enabling customer friendly*" is become a prime motto for all form of businesses. This also led the stock market brokers to upgrade their trading platform from time to time according to their customer's requirement. Since, gratification of customers is a major concern for the stock brokers business. The stock brokers need to improve the trading platform, which they offer for their clients. For the past few years, the online trading platforms where enabled in the form of mobile applications for the interests of the investors.

Literature Review

Dr. A. Abdul Rahim (2013) identified the drawbacks that related to online trading. He insisted that investors should be aware of all the troubles and problems and secure enough while online trading

Nidhi Walia and Ravinder Kumar (2007) stated that trading through online minimizes the cost but most of the Indian investors were unaware about it. So, it focused only by the educated investors

Sarika Srivastava (2011) analysed the impact of internet availability for trading online. She considers it as a major problem, that has to sorted out for hassle free trading

Objective of the Study

- To know the investors preference towards mobile apps for online trading
- To analyze the factors influencing the gratification level of online trading mobile app users
- To understand the difficulties experienced by the online trading mobile phone app user.
- To study the overall gratification level of online trading mobile app users
- To examine whether the investors switch over of stock broker due to the performance of mobile app

Methodology

- 100 respondents were considered for this study as a sample size, limited to Tamil Nadu.
- Snowball sampling method has been used for selecting respondents.
- Both the primary and secondary data has been taken for
- Primary Data has been collected throughstructured questionnaire
- The collected responses were compiled by using percentage analysis and factor analysis.

Interpretation of Data

S. No	Socio-economic Characteristics		Response
1	Gender	Male	72
		Female	28
2	Age	<25	21
		26 – 35	33
		36 – 45	32
		45 – 55	06
		> 56	08
3	Educational	UG/Diploma	55
		Post graduate	42
		HSC	03
4	Occupation	Student	07
		Employed	24
		Professional	38
		Business	16
		Home Maker	09
		Full Time Stock Trader	06
5	Annual Income	<5,00,000	26
		5,00,001-10,00,000	41
		10,00,001-15,00,000	19
		>15,00,000	14

Table 1: Demographic Classification

S. No	Name of the mobile trading App	No. of Respondents
1	Kite App by Zerodha	16
2	Upstox	07
3	Angel One by Angel Broking	10
4	IQ Option	06
5	IIFL Markets	12
6	Sharekhan	07
7	Ventura Wealth	05
8	MothilalOswal	26
9	Mobile Invest by Adithya Birla Money Limited	11

Table 2: Investors preference towards mobile apps for online trading

Inference: Table 2 shows the analysis of Investors preference towards mobile apps for online trading. 26 per cent of respondents are using MothilalOswal Trader App.

Factors Influencing the Gratification Level of Online Trading Mobile App Users

FACTOR LOADING	1	2	3	4	5
Ease of Placing Orders	0.718				
Instant Access	0.791				
One Point Access	0.781				
Control on profit and loss by Limiting Feature		0.511			
Customized Watch List		0.505			
Interactive Charting			0.522		
Historical Charts and Analysis			0.673		
Live Related News				0.716	
Live Market Data and Portfolio				0.610	
Research Reports					0.521
Notification Facility					0.530

Extraction Method: Principal Component Analysis

Rotation Method: Varimax with Kaiser Normalization

a. Rotation converged in 11 Iterations

Table 3: Factor Analysis – Rotated Component Matrix a

Factor	Name of Extracted Factor	Selected Variable	Factor Loading
1	**Factor X_1**	Accessibility	0.791
2	**Factor X_2**	Customization	0.511
3	**Factor X_3**	Chart Analysis	0.673
4	**Factor X_4**	Live Updation	0.716
5	**Factor X_5**	Market Data	0.530

Table 4: Analysis on the factors influence the gratification level of online trading mobile app users

Inference: From the table 3 and 4, the following factors are highly loaded among the different variables they are: Instant access to the trading platform (FX_1 = 0.791), control on profit and loss by Limiting Feature is highly loaded.

Difficulties Experienced	No. of Respondents	
	Yes	No
Hidden Brokerage	66	34
Poor Connectivity	33	67
Unavailability of products for trading	18	82
Poor customer care	26	74
Monetary Transaction problem	41	59
Complexity in understanding the features	73	27

Table 5: Difficulties Experienced by the Online Trading Mobile Phone Application User

Inference:73 per cent of respondents were experienced complexity in understanding the features on online trading mobile phone application platform. 66 per cent of respondents were experienced hidden brokerage charges during trading.

Statements	Overall Gratification Level				
	Very Low (1)	Low (2)	Moderate (3)	High (4)	Very High (5)
1. Rank the Performance of Online Trading Mobile Phone App	03	16	18	41	22
2. Rate your overall Gratification towards Online Trading Mobile Phone Apps	-	09	22	56	13
3. Will you suggest the Online Trading Mobile app that you are using to others?	02	12	41	25	20

Table 6: Overall Gratification Level of Online Trading Mobile App Users

Inference:41 per cent of respondents are ranked high with regards to the Performance of Online Trading Mobile Phone App. 56 per cent are highly gratified with the Online Trading Mobile Phone Apps. 41 per cent of respondents are moderately like to suggest Online Trading Mobile app that you are using to others.

Statement	Yes	No
Have switch over the stock broker ever due to the performance of mobile app?	67	33

Table 7: Switch over of Stock Broker due to the performance of mobile app

Inference:

67 per cent of respondents have switch over the stock brokers due to the dissatisfaction towards the performance of mobile app that they used.

Major findings of the study

- 26 per cent of respondents are using MothilalOswal Trader App
- Investor's gratification level - Influencing Factor "Accessibility" is highly loaded in factor analysis.73 per cent of respondents were experienced complexity in understanding the features on online trading mobile phone application platform
- 41 per cent of respondents are ranked high with regards to the Performance of Online Trading Mobile Phone App. 56 per cent are

highly gratified with the Online Trading Mobile Phone Apps.

- 41 per cent of respondents are moderately like to suggest Online Trading Mobile app that you are using to others.67 per cent of respondents have switch over the stock brokers due to the dissatisfaction towards the performance of mobile app that they used.

Suggestion and Conclusion

Reengineering of business is become a need of the hour. Stock trading brokers have started to push bundle of innovative trading support features through the mobile application. This study evidenced that majority of respondents found difficulty in understanding the available features in the mobile app. To sort out this issue, the Stock broking companies can simplify their platform or they can strengthen the customer care support. Majority of respondents have switched over their stock broking companies due to the dissatisfaction towards the performance of their mobile application. This study suggests stock broking companies to retain the traders or investors, by regular communication with their clients to get feedback about their performance. This may help both the stock broking companies and clients to shore in their business.

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MILLENNIAL SATISFACTION ON AMAZON PRIME VIDEO PLATFORM WITH SPECIAL REFERENCE TO THRISSUR DISTRICT

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ABSTRACT

Consumer behaviour is being forced to change as a result of technological developments in the telecommunications infrastructure, increased smartphone ownership, low internet costs, and so on. The introduction of online video streaming apps like Netflix, Amazon Prime, and Hot Star, etc. has revolutionised the visual entertainment media sector. Mainly millennial consumers are shifting from traditional streaming to OTT video streaming platforms. The report of data sciences division of Dentsu Aegis Network (DAN) India, 65% of millennial and Generation Z prefer to use video content on an Online video streaming platform over TV. Today the people are watching multiple media entertainment outlets at the same time. In this COVID 19 pandemic and lockdown the big budget producers and directors will be release films directly on OTT platforms like Amazon prime video. This research focused on the satisfaction of millennial users of Amazon prime video platform with special reference to Thrissur district of Kerala.

Keywords: *COVID-19, Millennial Consumers, OTT, Satisfaction, Viewers*

Introduction

The Internet has grown at an exponential rate in recent decades. The internet has certainly revolutionised our perception of entertainment, extending beyond the mid-century notions of going to the movies or reading periodicals. Aside from that, the internet serves as a platform for millions of individuals all around the world to find amusement. Covid19 A pandemic and a nationwide lockdown, in India, OTT video streaming platforms such as Hotstar, Amazon Prime, Netflix, Aha, Zoom, Zee5, and others have historically governed and boosted. In this COVID 19 pandemic and lockdown the big budget producers and directors will be release films directly on OTT platforms like Amazon prime video. Over-the-top media services refer to the distribution of movies and shows over the internet to users or viewers without the usage of cable or satellite television. The 'over-the-top' is an internet-based services that permit users to stream media content over the internet without cable or satellite subscriptions. The primary aim of the study is to explore the satisfaction level of millennial users of Amazon prime video with special reference to Thrissur District.

Literature Review

(Upganlawar, Pawar, Deshmukh, & Syed, 2021) Examined the customer satisfaction towards Netflix users in Pune city. The study revealed the majority of the customers are satisfied with the content provided by the Netflix. And the study suggested that the revision of the pricing strategies adopted by Netflix.

(Yaeri Kim et. al., 2021) investigated the effects of O2O-based mobile shopping application (MSA)'s information and service quality on the user's perceived privacy protection, satisfaction, and loyalty. The study analyzed through PLS-SEM by using structured questionnaire collected from 969 respondents. The researcher concluded that qualified information and services of O2O MSAs positively affect both perceived privacy protection and customer satisfaction, which finally lead to customer loyalty through the lens of the information systems success model.

(Rajeev Ghode, 2020) explored media consumption and media preferences among millennial during lock-down period. The study found that during lock-down time, the millennial consumed more media; they are over connected on different media platforms and also overloaded with different content. The millennial consumed much of the media in the form of short social media posts, surf internet and consumes video content on YouTube and OTT platforms. The millennial found using more online media.

(Haridas & Deepak, 2020) Studied the viewer perception about the two online service providers Amazon Prime and Netflix through viewer opinions collected from different social media platforms like Instagram, Facebook, Twitter, blogs, discussion forums, etc. The

customer opinions were checked for sentiments relating to content, audio/video quality, ease of use, and price related aspects of Netflix and Amazon Prime using the lens of e-service quality. The result states that Ease of use is an important aspect of e-service quality since both Amazon and Netflix are offered through technology aided platforms.

(Gangwar et al., 2020) studied the preference of OTT platform in India. Technological advancement and content quality is the major preference that influence the Indian customers to adopt the OTT platform. The study concluded that the millennium is attracted towards the OTT platforms due to foreign content and video on demand facility.

(Sharma & Chakraborti, 2020)COVID-19 is a virus that affects the respiratory system and creates serious complications in the human body. To check the community spread of this virus many countries like China, Italy, Spain, USA and India resorted complete lockdown thus leading to a standstill in business operations. This has hit the Service Sector hard and there is a fear of job loss and loss in profitability. This study identified the economic impact of lockdown due to COVID-19 on the Service Sector in India and its economic impact.

(Scott Fitzgerald, 2019)studied the growth of over-the-top (OTT) video services in India, such as Voot, Hotstar, Netflix, and Amazon etc. This article assessed the specific dynamics of platform growth in the country in relation to the interplay between new digital infrastructures, including fiber-optic cables, broadband networks, and smartphones; corporate strategies among small and large, local and international players; and state policy and regulation, which seeks to both address concerns about economic, political, and cultural security and spur the socioeconomic development of India among "wired" nations.

(Sujith et al., 2019)analysed the customer perception towards mobile wallets the study reveals that the majority of the respondents are aware and prefer the mobile wallet and prefer for digital payment.

(Khadim et al., 2018) studied the factors affecting brand loyalty and impact of perceived social media communication with brand trust and brand equity. Social media is a very well-built platform and it has substantial and significant impact on BL.

(C. Christopher Lee et.al., 2018)explored the factors which consumers considered when choosing cable television and online streaming options. The study collected primary data through a survey questionnaire at a large public university. Multivariate regression models were developed to identify factors affecting each option. The result showed that statistical significance. The regression model for cable TV showedadditional purchase, social trend (negative), cost and customer service factorswere statistically significant. In contrast to the cable TV, only social trend and available options were significant in the regression model for online streaming. Media options were marginally significant.

(Arora et al., 2018) examined the impact of social media advertising on millennials' preferences. The study concluded that the respondents preferences for using social media websites as they regularly read blogs, used social media platforms for comparison of different products, sought opinions of experts before buying a product, and the number of likes and dislikes had a significant impact on their choices.

(Amin et al., 2017) studied attitude and preference of customers in Islamic mortgage sector. The study concluded that the service quality produces the strongest predictor for the Islamic home financing preference.

(Khattab & Alhadid, 2015)studied the student's satisfaction through Technology Acceptance Model (TAM) and seeks to understand the relationship between perception such as perceived usefulness, perceived ease of use, security and privacy, convenience and students' usage. The study shows that there is a significant and positive relationship between electronic banking services and students' satisfaction.

(S.Rana & Lokhande, 2015)examined the consumer Preferences &Attitude towards Passenger cars. Factors such as after sales service, resale value, and fuel efficiency along with customer preferences while buying Maruti& Hyundai brands. The study concluded that proper customer care strategy plays an important role in satisfying & delighting the customers.

Research Methodology

The study is descriptive in nature. Both primary and secondary data are used for this study. Primary data is collected from the users of Amazon prime video through a structured questionnaire. 75 samples are taken from Thrissur district of Kerala and convenient sampling method is used for this purpose. The secondary data for the study is collected from various sources like journals, magazines and websites. There are 8 construct such as perceived usefulness, perceived enjoyment, perceived ease of use, convenience, information quality, audio and video quality, customization, subscription fee are used to measure the satisfaction of the millennial consumers of Amazon prime video platform.

Objectives of the study

- To identify the factors influencing the satisfaction of millennial users of Amazon Prime Video and influence of these factors on satisfaction.

Result and discussion

Table 1: Demographic profile of the respondents

Variable	Attribute	Frequency	Percent
Gender	Male	52	69.33
	Female	23	30.67
Profession	Students	48	64.00
	Govt. Employees	6	8.00
	Private Employees	9	12.00
	Others	12	16.00
Area of Residence	Urban	49	65.33
	Rural	26	34.67

Table No.1 represents the demographic profile of the millennial users of Amazon Prime Video in Thrissur district. The overall respondents were numbering, 75 users out of that 52 respondents are belongs to male category and 23 respondents are belongs female category this shows male consumers more used amazon prime video compared to female users. In the context of profession of consumers, majority numbering, 48 respondents were belongs to students. In the context of area of residence of the amazon prime video users, Majority numbering, 49 respondents were belongs to urban area and only 26 respondents from rural area.

Regression Analysis

Multiple regression coefficient measures the relationships between variables in such a way that it identifies the effect of independent variables on dependent variable. Here the multiple regression analysis for user satisfaction of amazon prime (Y) was performed with 4 independent variables like price (X1), Perceived Usefulness (X2), Audio & Video Quality (X3), Content Quality (X4).

Y = a0+b1X1+ b2X2+ b3X3 +b4X4

Where b is the unstandardized beta coefficients of each variable and a0 is a constant value. Inter correlation between the variables of user satisfaction revealed that all the predictor variables were entered simultaneously for regression equation because no multicolinearity exists among the selected 4 predictor variables.

The model summary table 2 shows the overall predictability of the regression model. In this case Adjusted R2 value 0.805 states that all the 4 independent variables of user satisfaction have 80.5 percent influence on the dependent variables. The Durbin Watson statistics shows that the predictors are free from auto correlation.

Table 2 : Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.903[a]	0.816	0.805	0.147	2.213

a. Predictors: (Constant), Price, Perceived Usefulness, Audio & Video Quality, Content Quality

b. Dependent Variable: Satisfaction

Table 3: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.74	4	1.685	77.506	.000[b]
	Residual	1.522	70	0.022		
	Total	8.262	74			

a. Dependent Variable: Satisfaction
b. Predictors: (Constant), Price, Perceived Usefulness, Audio & Video Quality, Content Quality

Table 4: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.419	.247		1.694	.095		
	Audio & Video Quality	.221	.042	.332	5.281	.000	.666	1.503
	Content Quality	.296	.055	.381	5.395	.000	.528	1.895
	Perceived Usefulness	.183	.050	.231	3.620	.001	.649	1.541
	Price	.207	.037	.309	5.622	.000	.873	1.145

a. Dependent Variable: Satisfaction

Table 3, ANOVA results reveals p-value as 0.000 which is less than 0.05 and it indicates that regression model is statistically significant. Thus it has been identified that price, perceived usefulness, audio & video quality, content quality are closely associated and have an effect on the satisfaction of amazon prime video users.

It is identified from the coefficient table, the variables like audio & video quality (Beta Coefficient = 0.332, Sig = .000), content quality (Beta Coefficient = 0.381, Sig = .000), Perceived Usefulness (Beta Coefficient = 0.231, Sig = .001), price (Beta Coefficient = 0.309, Sig = .000) have significant positive effect on users satisfaction, since all the significant values of predictor variables is less than 0.05. It reveals that the variables such as price, perceived usefulness, audio & video quality, content quality has the highest significant positive effect on satisfaction of millennial users of amazon prime video.

Thus, the multiple regression equation for predicting the user satisfaction is as follows:

Satisfaction of amazon prime video users = 0.419 + 0.221(Audio & Video Quality) + 0.296 (Content Quality) + 0.183 (Perceived Usefulness) + 0.207 (Price)

Conclusion

The over-the-top media services (OTT) market in India is predicted to grow at a 21.8 per cent CAGR from INR 4,464 crore in 2018 to INR 11,976 crore in 2023, according to PwC's Global Entertainment and Media Outlook 2019–2023. The impact of COVID-19 and national lockdown continues to overturn everyday life, consumption of video streaming platforms continues to spike in India and the world. This study identifies the factors that affect the satisfaction of Amazon prime video millennial users in Thrissur district. Price, perceived usefulness, audio & video quality, content quality are closely associated and have an effect on the satisfaction of millennial users of amazon prime video.The study is limited to only four variables further study may conducted adding some other variables. And the study cover only the amazon prime user's point of view further study must be conducted with different stakeholders and different age groups.

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EMERGING TREND IN THE EMPLOYMENT LANDSCAPE POST COVID-19.

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ABSTRACT

Covid-19 pandemic has created a grave situation for people across the world. No one knows when the situation will normalise. While the pandemic has affected almost all sections of human life, it has created a barricade for the Workforce as we witnessed lot of job losses and salary cuts by the companies. India is not far behind the situation. Unemployment was at high in India during the covid-19 outbreak. But people learned to strive in this uncertainty by started learning new tools to equip themselves to face the grim situation. This present paper discusses on the new emerging trend that is driving the current employment scenario. The paper is discussed in three sections. 1. Technology and digital skills 2. Remote work culture 3. Gig Economy. The first section discusses the impact of technology post covid-19 on the employability skills of the workforce. It is identified that how digital skill will embrace the whole business models and there's a need to equip the workforce with the current digital skills. The second section of the paper discusses how remote work culture has now been the new work model for almost all the organisation. The third section discusses the role of gig workers and identifies that gig economy will be the new work environment model.

Keywords: *Covid-19; Digital skill; Employability; Employment; Remote work culture*.

Introduction

In this Covid-19 pandemic, India witnessed a drastic shift in the employability landscape setting a new trend in the working environment. When Covid -19 shook the world, India was not far behind the spread of this epidemic and was affected badly with its economy going down. Many large industries had a massive hit during the pandemic. Small and medium industries suffered the worst. Healthcare industry was seen in a very challenging situation, many of them not able to meet the demand of the three billion population. due to the series of lockdown and travel restrictions, tourism industry suffered. IT Industry which is the most sought-after industry for many of the youth stopped hiring, resulting in an unemployment rate coming down to nearly 24% in 2020 (CMIE, 2021). Covid-19 pandemic though bought lot of economic shocks, and created a new wave of employability and work culture. The remote work culture showcased India's skilled workforce both in formal and informal sector. With the revolution of Industry 4.0 and the digital Innovations, the unemployment rate showed rising with the widespread use of internet technologies and smart devices. Technologies like Artificial Intelligence are increasingly used in healthcare industry, biotechnology and tele-medicines. Data science professional are the most demanded professional post Covid-19. Remote work culture has helped professional to collaborate remotely over their gadgets and devices to meet the various business demands. (India skill Report. 2021**).**Challenges are emerging on both the supply and the demand side of work and education Post Covid -19. On the supply side, there's an increase in demand for network connectivity and digital skills, on the demand side, there is a greater need for the creation of an congenial environment with adequate recovery packages by the Governments conducive to decent job creation and to successful implementation of lifelong learning.**"(**ILO,2021**)**

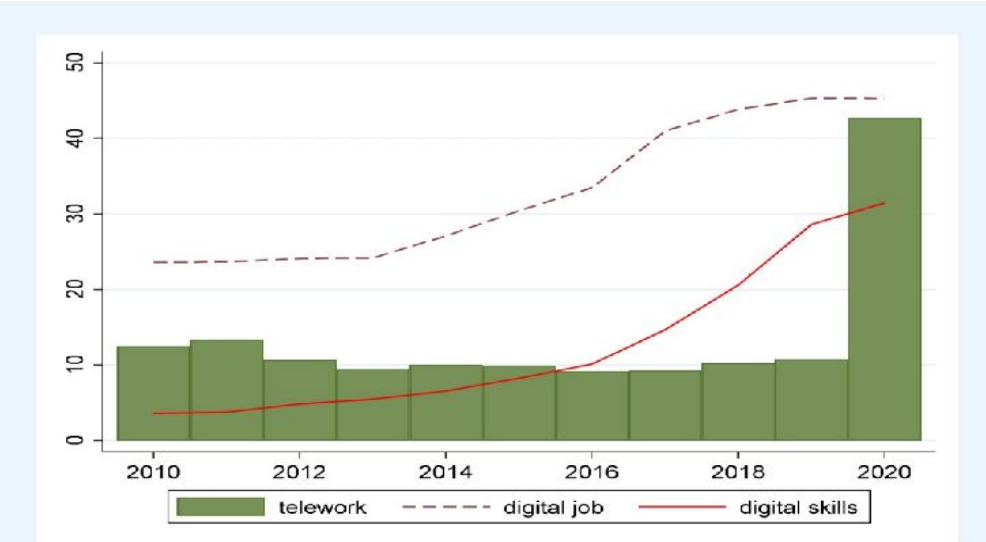

Figure1:Trend Showing Increase In Digital Skills

Corona virus pandemic has changed the entire business model making it technology driven. It has necessitated that citizen across the globe practice social/physical distancing. Public places and businesses where people earlier used to gather were closed, educators who are not well versed in technology where forcedto move towards online teaching; (Beth A. Buchholz, Jason DeHart, Gary Moorman,2020). Online certification programmes were extensively undertaken by people especially job seekers and employees to equip with the upcoming technology. A steep incline in the inclusion of technology in businesses was seen in both the formal as well as in the informal sector. According to Kanwal Kaul**,** Director – Human Resources, Talent Acquisition / Chair D&I Council-2019 NatWest Group**"**Foundation of skills required in the future will be technology driven which will then cut through the functions. For example, in retail banking, regulatory operation skills such as modelling, valuation, equity fund search, consumer wholesale, Treasury, banking, operation analytics, RP, data Sciences, cloud product engineering are going be in demand in the retail space". Sahil Sharma, Co-founder of Gig India, also pointed out that the "technical skillset is steadily emerging as complementary to every other skillset, skills such as marketing, sales, accounting or even art which were non-technical earlier, are now greatly impacted by technological disruptions". The new normal and social distancing has actually resulted in the promotion of freelance job /gig workers thereby, shifting the focus sharply to gig economy. The Associated Chambers of Commerce and Industry of India (Assocham) has projected India's gig economy would grow at a compounded annual rate of 17% to reach $455 billion by 2023. The global embrace of remote work or working from home has reset expectations, employment choices and work cultures. According to industry expert Sandip Patel, managing director of IBM India and South Asia; there is going to be a structural shifts as part of the hybrid workforce that blends in-person employees with virtual. (CNBC,2021)

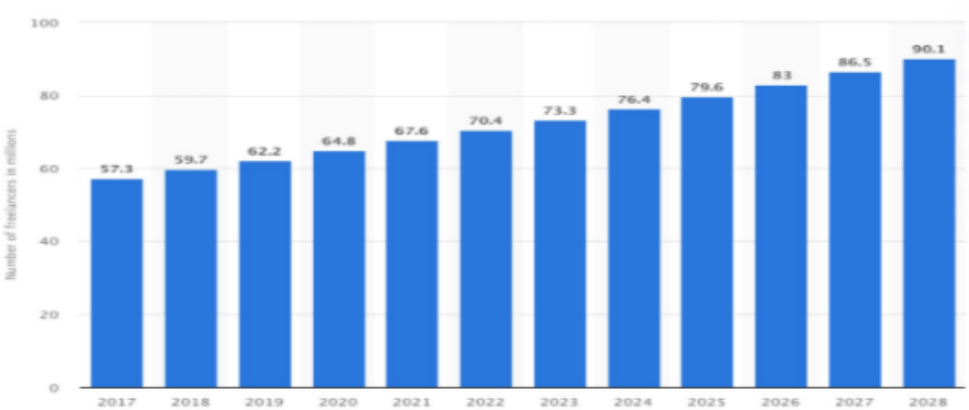

Fig 2: Growth for Gig Economy Over Years

Rationale of the Study

Covid-19 pandemic has interfered in every walk of the human life. The International Monetary Fund Report in 2020 observed that in the face of Covid-19 pandemic, the global economy faces its worst downturn since the Great Depression following the IMF, the Oxfam International in there 2020 report warned that half a billion people could be pushed into poverty as a result of the Covid-19 pandemic, (Kanu Ikechukwu Anthony,2020). Thus, the impact is profound on the employment and employability of workforce. Even before the Covid-19 occurrence, there has been a serious discussion on the changing employability scenario due to the influence of Industry4.0. After the pandemic the discussion on the employability literally became inevitable due to the New normal post covid-19. Pandemic has affected in all sectors of the economy and has raised to serious research questions on the employability and employment of citizens. How Covid-19 will change the working environment with the technologies like AI and data science? The need for digital skills, and how remote work culture is going to affect the jobs? what will be role of gig workers? This paper reviews and discusses on the employment and employability scenario highlighting some of the key trend which is bringing a significant change and challenge in the hiring of the workforce. The paper reviews employability and post Covid-19 challenges explained in three section. These three sections are inter-related cutting –edge concepts, **a**. Digital skills **b.** Remote work culture and **c**. Gig economy. All these trends are having a tremendous influence on the future employment and employability scenario.

a. Digital Skill

Even before the outbreak of covid-19, Industry 4.0 already started to transform the world of work. What is Industry 4.0? Industry 4.0 is the technology that is going to rule the future economy. The fourth industrial revolution is led by Cyber Physical System (CPS) technology to integrate the world with the new information age for future industrial development **(**Keliang Zhou ,Taigang Liu, Lifeng Zhou ,2015**)**This technology will transform the business models with greater efficiency and productivity. It is a blend of Advanced analytics, Big Data, Robotics, Animation, Artificial Intelligence, Internet of things, Augmented Reality and Process Digitisation across the business value chains. Since India's manufacturing sector is in a state of industrial transformation and upgrading, India too is having opportunities and encountering some challenges due to this transformation. India is the fourth country after US, China and Japan to embrace the massive digital technological transformation. Industry 4.0 will play a major role in some of the recent initiatives of Government like Athmanirbhar Bharath.Post Covid-19 pandemic, digital transformation in work and workplace has become more concrete. Global tech companies like Microsoft, apple and Amazon were among the top 10 stock by market cap in the Mid-April, are firms which use innovative technologies such as online retail and food delivery with contactless delivery options,3D printing companies for personal protection equipment and video conferencing application such as Zoom (Hughes, P., Morgan, R. E., Hodgkinson, I. R., Kouropalatis, Y., & Lindgreen, A., 2020). With the digital transformation old skills are going to disappear and become obsolete faster. Aging workers are at risk falling into low-skilled and low-paying jobs (Lovász and Rigó 2013; Ilmakunnas and Maliranta, 2016)**.**Digital globalization in the twenty-first century is fostered by digital technologies and characterized byaccelerating and increasing flows of data and information. In the process of digitalization of the economies,global data flows are surging and digital platforms allow more countries and smaller enterprises to participate **(** Beheshti, A., Schiliro, F., Ghodratnama, S., Amouzgar, F., Benatallah, B., Yang, J & Motahari-Nezhad, H. R. , 2018). According to MckinseyCo Ltd., "A degree of technological skill will be essential to each employee. Basic digital skills will enable them to feel comfortable and maintain seamless contact with their organization's ecosystem – clients, partners, suppliers, and public authorities. This skill will also give employees a basic understanding of critical technology, data concepts, and processes including data

visualization, applied machine learning, and advanced analytics". The increase in remote work requires managers to demonstrate these skills in an increasingly autonomous environment. For example, what skills will a procurement officer now need to help company relocate production and rethink the supply chain? creativity? innovation? problem-solving? an ability to manage big projects remotely? Are certain need and skills in this uncertain situation (Mckinsey&Co., 2021**).** Digital technology plays an unprecedented role in the maintenance of daily life , economic and social activities, as well as the recovery of industries and business activities. Therefore, the Coronavirus-pandemic could become a tipping point for digitization, a dawn of a new era by accelerating the maturity of digital technology **(**Sneader & Sternfels, 2020**)**

b. Remote Work Culture

Remote work has not only defined the hiring process of 2021, but also has been the new way of work environment among corporations and businesses. It has become the 'new normal' overnight after the pandemic. The increased access to technology and the internet has allowed'working teams' to collaborate remotely over their gadgets and devices and to meet varied needs of businesses. The digital technology is affecting most of the processes of the firms, enabling communications to be even more efficient. The use of smartphones is becoming increasingly pervasive and accelerator of digital globalization (Donnan & Leatherby, 2019). The unprecedented outbreak of Covid-19 pandemic 2020 has pushed millions of people to work remotely, inadvertently leading to de facto experiment of remote working. (Kniffin et al., 2020)..During the pandemic,most of the people were surprised by how quickly and effectively technologies like videoconferencing and other forms of digital collaboration were adopted in the entire working space. For many, the results have been far better than imagined. According to McKinsey research, "80 percent of people questioned, reported that they enjoyed working from home, Forty-one percent said that they were more productive than they had been before and 28 percent answered that they are as productive as they were working offline". Thus work from home liberated employees from long commutes and travel and helped employees to discover more productive ways to spend travel time, enjoying with greater flexibility while balancing their personal and professional lives. Many organizations started to search new poolsof talent with fewer locational constraints, adopted innovative processes to boost productivity, created a stronger culture, and significantly reduced real-estate costs. The face of global IT has changed forever and "remote work" is now simply "work". This is the new cultural norm around the world where information technologies including cloud computing, video conferencing, collaboration platforms, and broadband Internet are extensively been used. We have reached a tipping point for remote work as more and more companies are forced to overhaul their IT infrastructure to enable their employees to be productive remotely (Watson, Ives, & Piccoli, 2020**).**The pandemic has introduced new areas of research such as the use of contact tracing apps, covid-19 infection dashboards, digital technologies to prevent the next pandemic, e-learning, and remote work (Recker, 2020). The increase in the reported deaths worldwide due to COVID-19, has forced large corporates to adopt remote working options. The potential for remote work is seen more among highly skilled workforce, among a handful of industries, occupations, and at certain geographies. Remote work has raised many issues and challenges for both employees as well as for employers. Companies are finding out ways to train their employees remotely and how to change workspaces to enhance employee safety. (Mckinsey,2020), But for certainbusiness activities which require physical and manual work like operating machinery, personal car, using laboratory, processing customer transactions etc., are struggling as they cannot be done remotely. Organisations which are technology dominant and involved in business activities like data processing and communication seemed to be more easily equipped with the remote working. Similarly, educational institute and training centres are also managing remote working quite comfortably. Activities like coaching,

counselling, building customer relationship, appointment of new employees,teaching and training, collaboration towards Innovation, problem-solving and creativity can be done effectively though remote working. The important advantage of remote working is greater flexibility and mobility benefitting both the employee as well as employer (Ludivine, 2017), but at the same time also faces certain challenges (Cooper & Lu, 2019) and criticism when activities are done remotely for example, lot of criticism were raised against the online teaching questioning the quality of delivering. Similarly,courtrooms when functioned remotely faced challenges as many defendants lacked adequate connectivity.(Mckinsey, 2020) Barrero et al. (2021) estimated that in US roughly 20% of the total working time will be delivered from home after pandemic is over, resulting challenges towards the mental health of the employees. In spite of the opportunity that remote working brings it also raises lot of question on the performance and emotional side of the employees. An employee may begin to feel lonely and socially isolated due to the absence of face-to-face interactions and less frequent opportunities for personal and professional relationship building. (Bell, B.S., 2012).Another important discussion related to remote working is that how it can help women to cope with their work and family life and reduce stress (Mas and Pallais, 2017; Angelici and Profeta, 2020).

c. Gig Economy

Participation in the gig economy has grown rapidly over the past few years, and expanded exponentially since the onset of the coronavirus pandemic. Covid-19 created multiple challenges of health problems and increased movement of people due to lockdown, necessitating a work environment which is entirely through digital or online platform. The new normal has changed the traditional working world and has forced many of the white and blue collar employees to pursue gig work for income during this unprecedented times.(WEF, 2020). Covid pandemic has resulted in a unique collaboration between full-time workers and part-time workers providing firms to hire workforce with minimum salary and incentives, thus giving rise to a unique workplace milieu: gig economy (Knowledge@wharton,2020).Gig workers are independent contractual workers who enter into a flexible agreement with companies or through certain platforms for on-demand work completion. **(**Donovan, S. A., Bradley, D. H., & Shimabukuru, J. O. ,2016**).** The popularity ofgig economyis that it facilitates a flexible working pattern based on service demands and gives workers the liberty to choose their own workplace with task being performed virtually(Stewart and Stand ford, 2017). Organisations are also preferring gig economy as it provides a temporary and flexible working space rather than hiring full-time employees. As the world started to fully embrace this new way of working, business leaders must plan for this inevitable shift and find new ways to support workers to ensure the gig economy's long-term viability. One of the biggest benefits of the gig economy is the flexibility it offers, both in terms of working hours and the types of jobs that workers can take on. In fact, before the pandemic, around 70 % of gig workers reported that they participated in the gig economy out of choice and because it provided more flexibility, and more income, than a full-time job.**(**Forbes, 2020). Even though COVID-19 pandemic has disrupted the current job landscape, gigemployment isgaining moreground and is offering huge potential for both blue-collar as well as white-collar job seekers. According to Kaushik Banerjee, Vice PresidentandBusiness Headof Teamlease.com and Freshersworld.com., "Gig economy has been there for a long time. It's being embraced like never before, in India, due to the challenging economic conditions along with the Covid-19situation,"(Economictimes, 2021).

Delivery agents are the biggest gig worker in demand and the other services like warehouse helpers, assemblylineoperators etc., has also entered into this new gig economy. In white-collar gigs, designers, content writers and digital marketers are in demand as e-commerce sites require more data driven activities. Gig India co-founder and CEO Sahil Sharma says that companies have now started shifting full-time entry-level roles to a gig model andexplains how their company GigIndia have

uploaded around 3,500-plus job opportunities for gigger's on their platform within six months. Another feature of the gig economy is the work from home gigs. It is said that there has been a 115 per cent increase in work-from-home gigs during the lockdown and the percentage of women gigger's grew from 12.07 per cent to 29.34 per cent withinsixmonthsbefore and post-Covid-19 job market. According to Abhay Mathur, Senior Vice President, Finance, Urban Company, a flexible workforce will help organisations to manage costs as well as deal with the peaks and troughs of demand. It also enables rapid scale up when exponential growth happens and helps provide specialist skills forone time"**(**www.economicstimes.com)

Conclusion

This is a conceptual paper which explores the new trend in the employment and employability scenario Post-Covid -19 pandemic. A heterogeneous workforce with digital skill tandem with the gig economy connected virtually will be the new trend in the employment scenario. The paper gives a broad picture on the Post Covid-19 employment and employability scenario and discusses it in three sections. 1. Digital Technology and employability skills; which discusses how digital technology has changes the concept of employment and employability and reiterate the need to equip the workforce with the new technology in order to survive businesses post-Covid-19. 2. Remote work Culture; Within just a few weeks post Covid-19 pandemic we witnessed a massive shift to remote work that changed the office as we know it forever. Many large companies are asking employees to work from home for months to come, and some companies are making plans to shed office real estate and permanently move some portion of their workforces to remote working. **(**Howard-Grenville, J. (2020). Remote work culture has helped in retaining the best talent in companies. Time and focus to work among employees has increased after working remotely. Companies has to come with new working strategies to meet the challenges that arise in the remote work. 3. The third section discusses about the gig economy and how it will help in creating a blended workforce to accommodate uncertainty that has arisen due to the Covid-19 pandemic. The current paper is expected to bring new insights into the three emerging trends that will affect the employment and employability scenario in a long run. This study can be further explored to study the impact of these new job market trends in terms of the employability, employment and the economy.

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CONSUMER RIGHTS AND PROTECTION IN CYBER SECURITY

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ABSTRACT

E-Commerce can be characterized as this purchasing and advancing of magnificent and administrations over the net. The cyber safety in now transforming into an enormous stage for substitute and exchange for advancing and looking for of item and administration. It is an emotional progression inside the systems administration focuses wherever in the world, Now the buyer are provided various benefits of forceful costs, various decision, less troublesome delivery administrations and numerous others. There are different worthwhile extraordinary potential outcomes which can be introduced on the web stage occasion e-banking and online payments. There are concerns, for example, online character theft, data protection, salami assaults etc,and ordinarily little yet reoccurring issues, for example, item not conveyed or the item doesn't affirm to the real portrayal are the standard undertaking. In such circumstances the consumer is regularly left with no cure due to different escape clauses in our laws that are worried about these issues. The current investigation expects to comprehend the consumer rights and their protection in cyber security reference to network protection, and examinations the issue looked by the online consumer. Hence the analyst has adjusted enlightening exploration plan and taken on Convenience sampling method and information was gathered from 150 distinct respondents in the study area.

Keywords: *E-Consumer, Cybercrimes, Consumer awareness, Lack of Security.*

Introduction

E-Consumer or (electronic consumer) are the sorts of buyers which are seen inside the internet, who utilize the net gateways of buying things and administrations. In these days time while the whole market is developing to its extreme utilizing online undertaking has extended moderately. Presently individuals like to plunk down inside the relief in their receiving area wear at home and buy something they need to with a depend of snap on. Every one of the consumer that utilization the net contributions are alluded to as e - consumer.

Consumer Rights And Cyber Crimes

Cyber security approach in which there might be a utilization of a PC people group or gadget to reinforce opposite end via the way of out of line rehearses. The term is a famous term that covers violations like phishing,MasterCard cheats, monetary organization burglary, unlawful downloading, business surveillance, child erotic entertainment, grabbing kids by means of talk rooms, tricks, digital illegal intimidation, approach as well as appropriation of infections, Spam, etc. Digital wrongdoing is a broad time span this is utilized to characterize criminal interest wherein PC frameworks or pc networks are a device, an objective, or a position of criminal intrigue and envelop the entire part from advanced breaking to disavowal of supplier assaults. It additionally covers the customary violations where PCs or organizations are utilized to permit the unlawful action

Chain Letters

Chain letters guarantee beneficiaries that if they follow straightforward advances and strategies as directed through them and records scope of ventures plans where you might place in their cash then the cash so contributed with the guide of them may be multiplied or significantly increased.

Bad Packaging Or Defective Item Sent

Every other very common trouble that can be seen almost day by day is that the transport of the gadgets isn't always in conformity with what have been promised and is either A substandard comma a faulty piece or just a horrific packaging lately many states have registered numerous wide variety of instances against numerous E-Commerce web sites regarding this problem in which the product is of substandard exceptional and does no longer conform to what were ordered.

Spoofing

Imitating another man or lady or an element that incorporates online Communications is alluded to as mocking. There are a different

characteristic of the virtual worldwide that makes this activity and the commitment one clean framework. The Identity of the area owner and the Communications are for the most part a ways off and the spaces are distributed with no confirmation of the equivalent.

Spamming

Majority of spontaneous business messages and making the mechanical situated of the subject newsgroup postings this can be alluded as spamming. This prominent utilization of the promoting approach changed into held in the US in 1994 in which a guideline firm in Phoenix Arizona started posting commercials and in the bunches of newsgroup contributions the administrations of that business and the administrations of the moved lawful experts and the shape have gotten very notable and became issue between the gatherings of the youths web clients. In any case, this turned into a break of web behavior and became viewed as an extreme offense.

Misleading Advertisements

Consider this you acquire an email that offers loose looking for the first buy that you make on-line via that web site otherwise you get unfastened journey for your first reserving of a web cab services. But there are possibilities which you never get those gives on numerous Grounds just like the offer isn't relevant on the product different services that got however on a few different one.

Creating Consumer Awareness

Consumer who's widely recognized about his rights and knows what's proper and incorrect for him will be tons much less accountable for getting trapped into any fraud towards him. It is the duty of the government to make attention programs for the consumers so one can realize about their rights and a way to feature them if there's any Need for redressal in case of any dispute that arises with the client. Now even two tier towns choose on-line purchasing but aren't much privy to their rights in case of on line buying does they ought to be made conscious genuine training or with the aid of creating cognizance campaigns the various humans. Children in faculty should be made aware about the customer rights that are to be had inside the consumer safety act, and additionally they ought to be made aware of the consumer rights in e-trade enterprise. Because if we make a toddler conscious. That way making a whole own family aware about the rights and duties as according to the customer protection act.

Literature Review

Sharma (2006) clarified the opinion computer crimes of restricted in India. But the intense of computer crime has been round the nook. Computer systems have unprecedented opportunity for illegal profits, for mischief and for exhilaration. The ignorance concerning the possibility and that continues to be the primary savior, can't remain for very long 1 the criminal recognizes the potential and the mechanics; he has been going to let free good on planet. The law keepers have to ready themselves to battle and keep control with the imminent onslaught of the menace. Paranjape (2007) has reviewed the advance of the personal computer era has unquestionably established a boon to humankind up to now as much faster marketing communications, access that has been easy to info and saving of the insightful expertise have been worried. For an offshoot of the improvement of computer engineering, criminal pursuits in the emphasis of cyber crime have emerged posing a task prior to police agencies. Cyber criminality has turned into a worldwide phenomenon; the international locations around the globe have been a string to dedicate the menace. India has additionally enacted an extensive legislative known as the Information Technology Act 2000 for the avoidance as well as balance of cyber crime. Policing function has been not restricted to avoid crime and keep public purchase but has turned into a program to assist the individuals in most emerging like catastrophes.

Research Objectives

1. To understand the consumer rights and their protection with special reference to cyber security.
2. To examine the problems faced by the online consumer.

Research Methodology

- **Primary Data:** Data collected from the target respondents through Structured Questionnaire.
- **Secondary Data:** Data collected from different source such as Journals, Books, Magazines, Publications, Report and Internet.
- **Sample size:** 150
- **Sampling Method:** Convenience sampling
- **Area of the study:** Sivaganga district

Result and discussion

Demographic Factor Of Respondents

The demographic factor of Respondentsare explain about Gender,Age,Marital status, Educational Qualification, Occupation,and Annual income

Table-I

Demographic Factor Of Respondents

		No of Respondents (N=150)	PERCENTAGE
Gender	Male	**88**	**58.7**
	Female	**62**	**41.3**
Age	Below 20 years	**34**	**22.7**
	21-30	**70**	**46.7**
	31- 41	**21**	**14.0**
	Above 41 years	**25**	**16.7**
Marital status	Married	**50**	**33.7**
	Unmarried	**100**	**66.7**
Educational Qualification	HSC	**18**	**12**
	Under Graduate	**65**	**43.3**
	Post Graduate	**27**	**18.0**
	Professional course	**40**	**26.7**
Occupation	Private	**26**	**17.3**
	Government	**41**	**27.3**
	Own business	**35**	**23.3**
	Professional	**48**	**32.0**
Annual income	Less than Rs20000	**29**	**19.3**
	21000-30000	**14**	**9.3**
	31000-40000	**33**	**22**
	Above Rs41000	**74**	**49**

Source: Primary data

Inference

The above table shows that the highest 58.7% of the respondents were male and 41.3% are female. 46.7% of the respondents were fall under the age below 20 years, 14% of the respondents were fall under the age group 31-41 years.33.7% respondents are married, 66.7 % of the respondents are married,43.3% of the respondents are under graduate, 12% are Hsc.32 % of the respondents are engaged Professional, Further, 17.3% of the consumers are private.49% of the consumer have annual income is above Rs41000, 9.3% of the respondents are belong to Rs21000-30000.

Table-II

Problems Faced By Online Consumer

S.No	Statements	Mean score	t- Value	Significant
1.	Delivery and logistics	**4.49**	**15.854**	**0.000**
2.	Quality issues	**3.66**	**3.572**	**0.000**
3.	Additional charges	**3.79**	**3.961**	**0.000**
4.	Unclear return and guarantee policies	**4.19**	**9.722**	**0.000**
5.	Digital payment failures	**4.28**	**8.648**	**0.000**
6.	Lack of security	**3.99**	**6.566**	**0.000**
7.	Damaging products in transit	**4.45**	**14.97**	**0.000**
8.	Receiving wrong products:	**3.98**	**7.384**	**0.000**
9.	Delay in delivery of products	**4.10**	**8.077**	**0.000**
10.	Concerns When Buying from Foreign Companies	**4.36**	**10.888**	**0.000**

Source: Primary data

The above table shows that all the above statements are with reference to the problem faced by online consumer is found to be significant, as the t-value for all the statements are positive and significant value less than 0.05

Discussions and Implications

58.7% of the respondents were male and 41.3% are female.

46.7% of the respondents were fall under the age below 20 years, 14% of the respondents were fall under the age group 31-41 years.

33.7% respondents were married, 66.7 % of the respondents were un married.

43.3% of the respondents are under graduate, 12% are Hsc.(Higher secondary level)

32 % of the respondents are engaged Professional, 17.3% of the consumers are private.

49% of the consumer have annual income is above Rs41000, 9.3% of the respondents are belong to Rs21000-30000.

Delivery and logistics mean score is 4.49

Quality issues mean score is 3.66

Additional charges mean score is 3.79

Unclear return and guarantee policies mean score is 4.19

Digital payment failures mean score is 4.28

Lack of security means score is 3.99

Damaging products in transit mean score is 4.453.96

Receiving wrong products mean score is 3.98

Delay in delivery of products mean score is 4.10

Concerns When Buying from Foreign Companies mean score is 4.36.

Inference

Conclusion

Today, the E-Commerce is essentially affecting all forms of groups. In a very short span of time within seconds the online websites Can appeal to numerous customers at one pass does it has emerge as a very huge market for almost all the growing corporations. The net has changed the sport plan a lot so that majority of the commercial enterprise sports at the moment are executed on line. As of now the rights of a purchaser are furnished within the purchaser protection act 1986 but there is no such discussion about the electronic clients in the Act there is a totally important want for the legislators to framesat loss where the eagles human beings can locate the place in those acts. After going thru all the styles of e-trade crimes and judicial pronouncements you can actually easily make out that there's no particular provision for infringement of rights of a consumer. If the rights of a consumer are violated in the cyber space there is no constant provision that may be applied immediately however we must take a mixture of various provisions of the diverse acts to carry it beneath one umbrella. There is a totally important want of amendment of the purchaser act in addition to the information era act to carry the infringement of the rights of a client beneath the ambit of cyber-security.

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PEOPLES' PERCEPTION ON SMART CITY DEVELOPMENT IN COIMBATORE CITY

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ABSTRACT

In India, Smart Cities Mission is an Atal mission for urban rejuvenation and urban transformation, which was launched by Prime Minister Shri Narendra Modi in 2015, under this scheme 20 cities were selected for the first phase project. Smart city development projects aims at developing the cities which are facing problems due to overpopulation with technologically equipped facilities, improved infrastructure facilities, effective resource management, e-governance, etc, Coimbatore was selected as one of the city for smart city scheme, so this study attempts to understand the perception of the people residing in Coimbatore on the smart city development projects proposed and carried out in Coimbatore city. The data collection was carried out by convenience sampling, a non-probability sampling method. The study found that the respondents have a positive opinion towards this smart city development scheme. Most of the respondents insisted that the scheme should concentrate on some necessities like proper infrastructure development of the city, which can help elevate their lifestyle.

Keywords: *Smart city, Scheme, Coimbatore, Awareness, perception, satisfaction*

Introduction

More than 50% of the world's population is now urbanized. Particularly in developing countries like India most of the rural population are gradually migrating to the nearby cities for their livelihood. These migrations cause various problems related to infrastructure facility, health, waste management, traffic, pollution, scarcity of resources, crowd and lack of governance, etc., which hampers the growth and development of functions and promote economic growth, and improves the quality of life of the people residing thereby using smart technologies and data analysis. An infrastructure based around technology, environmental initiatives, effective and highly functional public transportation, confident and progressive city plans, people able to live and work within the city using its resources is the main characteristic features of the smart city. In India, effective measures are being taken in order to develop their cities with technological development and efficient resource management. In India Smart Cities Mission (SCM), Atal Mission for Urban Rejuvenation and Urban Transformation (AMRUT), and Pradhan Mantri Awas Yojana-Urban (PMAY-U) were launched by Prime Minister Shri Narendra Modi, on 25th June 2015. Under these schemes, 100 cities were selected for the smart city development project with the proposed investment of RS. 2, 05,018 Crore. In Tamil Nadu, 11 cities were selected under the smart city project. Among these cities, the Coimbatore is one favorable place for migrating people because of its climatic condition, a notable development in service sectors particularly in the education and health sector, employment opportunities, etc. So this study attempts to understand the perception of the people residing in Coimbatore on the smart city development projects proposed and carried out in Coimbatore city.

Literature Review

D. Novita and E.Suryani (2019) conducted a study on the smart city on public perception. The research was conducted on Bekasi city, West Java, Indonesia. The main objective of the study is to know the public perception towards smart city program in Bekasi smart city. The study result shows that the community is already aware of the importance and implementation of the smart city but their knowledge is still very limited. From the public perception this program is still considered to be ineffective and the communication program run by the Bekasi city government is still unable to answer public information and communication needs. **Si Ying Tan and Araz Taeihagh (2020)** conducted a study on Smart city Governance in Developing Countries: A Systematic Literature Review. The research

was based on 56 studies of smart cities in different developing countries. The main objective of the study is to examine the state of smart city development in developing countries. The study result shows that the technology-enabled smart cities in developing countries can only be realized when human , legal, economic, and regulatory reforms are made and Government needs to fulfill the basic infrastructure to the citizen, develop human capital, a supportive ecosystem, support start-ups, and promote public-private partnerships need to be created to attain the smart city vision. **Vinothini V and Vishnu Sakravarthy N, Nalini Palaniswamy** conducted a study on consumer preference on Energy Management Schemes in the smart city proposal with special reference to the Coimbatore city. The research was conducted on some important locations in Coimbatore city. The main objective of the research is to find the preference of the public towards energy management, affordability, and adaptability. The study result shows that they perceive energy management with a positive attitude and are ready to adapt to the changes when given a specific time period along with government support irrespective of their affordability. **Kushboo Gupta and Ralph.P.Hall (2017)** conducted a study on the Indian Perspective of smart cities. The research is based on inspiration leading smart cities, how smart cities are likely to evolve in India. The main objective of the study is to know the priorities and perspective of citizen and city officials. The study result shows that citizens value smart living and mobility, whereas city officials prioritize smart living followed by environment and the economy. Cities in India have an opportunity to embed smartness into their infrastructure whereas other countries are embedding smartness into existing infrastructure system which is quite tough.

Statement of Problem

The invention of smart phone technology shrinks the distance between the persons' and upgrade the people with the updated information's which in turn uplift the life style of the individuals. Likewise the smart city development projects aims at developing the cities which are facing problems due to overpopulation with technologically equipped facilities, improved infrastructure facilities, effective resource management, e-governance etc. Indian government announced 100 cities which are selected under the smart city scheme. In Tamil Nadu Coimbatore is one of the 11 cities selected for smart city development. In Coimbatore many projects were proposed and some of them were implemented. Even though majority of the people in Coimbatore knows that the city was under smart city scheme but most of them were not aware of the projects proposed under the scheme. At the time of the announcement the residents of Coimbatore expected certain developments like metro train, water management, e-governance, proper infrastructure etc. So, in this study an attempt is made to find out whether the people are aware of the schemes announced under smart city development and to know their opinion on the schemes proposed under smart city development.

Objective of the study

The study "Peoples' Perception on Smart City Development in Coimbatore City" attempts;

- To find out the awareness level of the people and to understand their attitude towards projects proposed under smart city development in Coimbatore city.
- To know their level of satisfaction towards the smart city project in the Coimbatore city

Methodology

Data collection was carried out by convenience sampling, a non-probability sampling method. Data was collected from 50 respondents and structured questionnaire was used to collect the data from respondents through google form. The questions were framed based on literatures reviewed. Area of the study was Coimbatore city. The data collected was analysed using Jamovi tool. Due to covid the data collection was limited to smart phone users.

Analysis and Interpretation

1. Age of the respondent

Levels	No. of. Respondents	%
Less than 18 years	6	12 %
18 to 25 years	29	58 %
26 to 35 years	8	16 %
36yearsto50years	7	14 %
Above 50 years	0	0 %
Total	**50**	**100 %**

(Source: Primary Data)

respondents belong to the age group of 18 to 25 years followed by 16 percentage of respondents belong to the age group of 26 to 35 years. No respondents were comes under the category of 50 years and above because due to COVID the respondents effectively using smart phones are only used as a sample. The Majority of the respondents i.e. 74 percentage belong to the age group of 18 to 35 years.

2. Gender of the Respondents

Levels	No. of. Respondents	%
Female	25	50%
Male	25	50%
Total	**50**	**100%**

(Source: Primary Data)

Table .2 explains the classification of the respondents based on their gender. It has been inferred that both men and women are equally distributed.

3.Present status of the Respondents

Levels	No. of. Respondents	%
Student	31	62%
Government employee	1	2%
Private employee	9	18%
Business	3	6%
Profession	1	2%
Home maker	4	8%
Unemployed	1	2%
Total	**50**	**100%**

(Source: Primary Data)

Table.3 has described the present status of the respondent. It is understood from the table that more number of respondents are students (62 percentage) followed by the private employees (18 percentage). The least number of respondents comes under category of Government employee, Profession, Unemployed (each 2%).

3.a. If Student, their level of education

Levels	No. of. Respondents	%
School level	2	6.5 %
Under graduation level	23	74.2 %
Post-graduation level	5	16.1%
Professional course	1	3.2%
Total	**31**	**100%**

(Source: Primary Data)

Table.3.a. Elucidates the educational level of student , most of the respondents are at Under Graduation level (74.2 percentage) followed by 16.1 percentage of the respondents at Post Graduation level and only 3.2 percentage of the respondents are studying professional course.

3.b.Educational qualification (other than students)

Levels	No. of. Respondents	%
School level	3	15.8 %
Under graduate	7	36.8 %
Post graduate	4	21 %
Profession degree	1	5.3 %
Diploma	3	15.8 %
Post-graduation level	1	5.3 %
Total	**19**	**100%**

(Source: Primary Data)

Table.3.b. shows the educational qualification of the respondents other than students. The more number of respondents have completed their Under Graduation (36.8 percentage) followed by the respondents completed post-graduation(21 percentage).

4. Are the Respondent is a resident of Coimbatore city

Levels	No. of. Respondents	%
Yes	50	100%
No	0	0
Total	**50**	**100%**

(Source: Primary Data)

Table.4 shows the residential status of the respondents .All the respondents are residents of Coimbatore city

.

5. Are the Respondent aware that the Coimbatore city is selected for Smart City Scheme

Levels	No. of. Respondents	%
Yes	50	100%
No	0	0
Total	**50**	**100.0%**

(Source: Primary Data)

Table.5 shows the awareness of the respondents towards the Smart City Scheme. All the respondents are aware of the Smart City Scheme.

5. a. If yes, how they come to know about it.

Levels	No. of. Respondents	%
Newspaper/other print media	10	20.0 %
Radio	1	2.0 %
Television	8	16.0 %
Internet	22	44.0 %
Through friends ,relatives/colleagues	9	18.0 %
Total	**50**	**100 .0%**

(Source: Primary Data)

Table.5.a. shows how the respondents came to know about the Smart City Development Scheme. More number of respondents are comes to know about the scheme through the Internet (44 Percentage) followed by getting information through friends, relative or colleagues (18 percentage).

5. b. If yes, the awareness level of the respondents on smart city development scheme in Coimbatore.

S. no	Description	Highly aware		Aware		Moderately Aware		Not Aware		Total	%
		No. of. Respondents	%	No. of. Respondents	%	No. of. Respondents	%	No. of. Respondents	%		
1	Assured electricity supply with at least 10% of smart city's requirement is from solar	16	32 %	18	36 %	8	16%	8	16%	50	100 %
2	Adequate water supply including waste water recycling and storm water reuse	13	26 %	21	42 %	10	20%	6	12%	50	100 %
3	Sanitation including solid waste management	12	24 %	21	42 %	10	20%	7	14%	50	100 %
4	Rain water harvesting	21	42 %	14	28 %	11	22%	4	8%	50	100 %
5	Smart metering	14	28 %	21	42 %	11	22%	4	8%	50	100 %
6	Robust IT connectivity and digitalization	14	28 %	15	30 %	16	32%	5	10%	50	100 %
7	Pedestrian friendly pathways	23	46 %	15	30 %	11	22%	1	2%	50	100 %
8	Encouragement to non-motorized transport (e.g. walking and cycling)	24	48 %	16	32 %	8	16%	2	4%	50	100 %
9	Intelligent traffic management	21	42 %	16	32 %	9	18%	4	8%	50	100 %
10	Non-Vehicle streets /Zones	12	24 %	19	38 %	12	24%	7	14%	50	100 %
11	Smart parking	15	30 %	20	40 %	8	16%	7	14.6 %	50	100 %
12	Energy efficient street lighting	19	38 %	20	40 %	7	14%	4	8%	50	100 %
13	Innovative use of open spaces	12	24 %	20	40 %	14	28%	4	8%	50	100 %
14	Visible improvement in Area	17	34 %	19	38 %	10	20%	4	8%	50	100 %
15	Safety of citizen	23	46 %	13	26 %	9	18%	5	10%	50	100 %

	especially woman &children										
16	At least 80% buildings should be energy efficient &green buildings	13	26 %	19	38 %	12	24%	6	12%	50	100 %
17	Improved e-governance	17	34 %	16	32 %	10	20%	7	14%	50	100 %

(Source: Primary Data)

Table.5.b. shows the awareness level of the respondents on smart city development scheme in Coimbatore city. For the purpose the factors stated in the above table are measured to know the awareness level. More number of respondents are highly aware of the factors like rain water harvesting, pedestrian friendly pathways, encouragement to non-motorized transport, Safety of citizen especially woman &children. More number respondents were aware of factors like Assured electricity supply with at least 10% of smart city's requirement is from solar, Adequate water supply including waste water recycling and storm water reuse, Sanitation including solid waste management, Smart metering, Smart parking, Energy efficient street lighting, Visible improvement in Area, At least 80% buildings should be energy efficient &green buildings. The more number of respondents are moderately aware of factors like Robust IT connectivity and digitalization, Innovative use of open spaces, improved e-governance and the more number of respondents are not aware of the factors like intelligent traffic management, Non-Vehicle streets /Zones.

6. Respondent's perception on smart city development scheme in Coimbatore city.

S.NO	**DESCRIPTION**	**Strongly Agree**		**Agree**		**Moderately Agree**		**Disagree**		**Total Respondents**	**Total %**
		No. of. Respondents	**%**	**No. of. Respondents**	**%**	**No. of. Respondents**	**%**	**No. of. Respondents**	**%**		
1	A smart city promotes and celebrates its unique identity and culture of Coimbatore city	30	60 %	12	24 %	7	14 %	1	2%	50	100 %
2	Whether the smart city scheme creates large –scale employment opportunities for its citizens	24	48 %	17	34 %	8	16 %	1	2%	50	100 %
3	A smart city provides access to improved health care for its entire citizen.	20	40 %	19	38 %	10	20 %	1	2%	50	100 %

4	Whether the scheme concentrates on improving the quality of educational institutions in the city.	23	46 %	18	36 %	7	14 %	2	4%	50	100 %
5	Whether the scheme covers the development of smart classes and technologically enabled lab in all government and aided schools.	23	46 %	15	30 %	9	18 %	3	6%	50	100 %
6	A smart city has sufficient housing for all income groups.	24	48 %	13	26 %	9	18 %	4	8%	50	100 %
7	Whether the smart city has 24/7 electricity supply	23	46 %	12	24 %	11	22 %	4	8%	50	100 %
8	A smart city has an internet network allowing high-speed connection to all.	22	44 %	13	26 %	11	22 %	4	8%	50	100 %
9	Wi- Fi connection in all public places	17	34 %	20	40 %	8	16 %	5	10 %	50	100 %
10	Whether the smart city scheme covers the effective measures to improve air quality in order to meet international safety standards.	21	42 %	18	36 %	7	14 %	4	8%	50	100 %
11	Whether the smart city is effectively providing e-governance for its citizen.	21	42 %	17	34 %	9	18 %	3	6%	50	100 %

12	A smart city meets 24/7 water supply.	22	44 %	17	34 %	8	16 %	3	6%	50	100 %
13	Whether the smart city scheme covers the effective waste management system.	24	48 %	15	30 %	8	16 %	2	4%	50	100 %

(Source: Primary Data

Table.6 shows the perception of respondents towards the above given factors .From the above table most of the respondents strongly agree with the factors like the smart city promotes and celebrates its unique identity and culture of Coimbatore city, the smart city scheme creates large –scale employment opportunities for its citizens, the scheme concentrates on improving the quality of educational institutions in the city, The scheme covers the development of smart classes and technologically enabled lab in all government and aided schools, A smart city has sufficient housing for all income groups, the smart city scheme covers the effective waste management system. The more number of respondents are agree with factors like the smart city provides access to improved health care for all its citizen, the smart city scheme covers the effective measures to improve air quality in order to meet international safety standards, smart city meets 24/7 water supply. The respondents are moderately agree with factors like smart city has an internet network allowing high-speed connection to all, the smart city is effectively providing e-governance for its citizen, the smart city has 24/7 electricity supply and most of the respondents are disagree with factor Wi- Fi connection in all public places.

7. Respondent's level of satisfaction on Smart City Development Scheme in Coimbatore City

S.NO	DESCRIPTION	Highly Satisfied		Satisfied		Moderately satisfied		Highly Dissatisfied		Total Respondents	Total %
		No. of. Respondents	%	No. of. Respondents	%	No. of. Respondents	%	No. of. Respondents	%		
1	Are you satisfied with installation of Air Quality Monitoring System and display boards of air quality monitoring	16	32 %	20	40 %	9	18 %	5	10 %	50	100 %
2	Are you satisfied with smart citizen App for the public to share their ideas	17	34 %	19	38 %	11	22 %	3	6%	50	100 %
3	Are you satisfied with installation of flood lighting at Nehru Stadium	24	48 %	18	36 %	6	12 %	2	4%	50	100 %
4	Are you satisfied with	17	34 %	21	42 %	11	22 %	1	2%	50	100 %

	murals on government buildings that reflects the culture of Tamil Nadu.										
5	Are you satisfied with installation of solar power plants at Ukkadam	24%	48 %	19	38 %	4	8%	3	6%	50	100 %
6	Are you satisfied with open space coverage activities such as parks ,walk paths, gardens etc	19	38 %	17	34 %	12	24 %	2	4%	50	100 %
7	Are you satisfied with underground drainage system implemented at various locations of the city	21	42 %	20	40 %	6	12 %	3	6%	50	100 %
8	Are you satisfied with the installation of Solar Tree with smart benches across 25 locations	23	46 %	15	30 %	7	14 %	5	10 %	50	100 %
9	Are you satisfied with cleaning lakes and building pathway around the lake and making it as attractive destination (e.g. I love kovai at Periyakulam lake)	22	44 %	15	30 %	9	18 %	4	8%	50	100 %
10	Are you satisfied with model roads in RS Puram and Race Course	24	48 %	19	38 %	4	8%	3	6%	50	100

(Source: Primary Data)

Table.7 shows the satisfaction level of respondent. From the above table most no. of. Respondents highly satisfied with factors like installation of food lighting at Nehru Stadium, installation of solar power plants at Ukkadam, model roads in RS Puram and Race Course. The more no. of. Respondents are satisfied with factors like, installation of Air Quality Monitoring System and display boards of air quality monitoring, murals on government

buildings that reflects the culture of Tamil Nadu, underground drainage system implemented at various locations of the city. Few no.of. respondents are moderately satisfied with smart citizen App for the public to share their ideas, open space coverage activities such as parks ,walk paths, gardens etc, cleaning lakes and building pathway around the lake and making it as attractive destination (e.g. I love kovai at Periyakulam lake).Very less no. of. respondents are highly dissatisfied with factors like the installation of Solar Tree with smart benches across 25 locations.

Conclusion

The study conducted on people's perception on Smart City Development Scheme in Coimbatore City revealed that even though all the respondents are aware that Coimbatore city was selected under the smart city scheme but their awareness level on the various schemes initiated under the smart city scheme differs. The respondents are highly aware on the schemes like rain water harvesting, safety of citizen especially woman &children, non-motorized transport but not aware about schemes like Intelligent traffic management, Non-Vehicle streets /Zones. According to people's perception towards the scheme most of the people agree with the factors a smart city promotes and celebrates its unique identity and culture , scheme must provide facilities for educational as well as health care and also they disagree with wi -fi connection in all public places. Then the satisfaction level of people for the completed projects in the Coimbatore city under smart city scheme ,most of the respondents are satisfied with model roads, food lightning at Nehru Stadium ,solar power plants ,lake cleaning initiative, underground drainage system, murals painted on government buildings and only few were dissatisfied with the solar tree and smart benches because it very limited to access by everyone .Even though some of their expectations like metro are not considered under the scheme so for they are having positive opinion towards this smart city development scheme and most of the respondents insisted that the scheme should concentrate on some necessities like proper infrastructure development of the city which hinders their day to day life.

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A STUDY ON THE ONLINE SHOPPING HABITSOF CONSUMERS BEFORE AND DURING COVID19 PANDEMIC

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ABSTRACT

The internet and the World Wide Web has evolved over the period of time and has created huge opportunities for both the marketers and the shoppers, making it easy for both of them to sell and buy respectively in the online marketplace. During the early stages of online marketing in India, consumers were hesitant to buy products online because of the reason that they believed in going to the shop, touch the product, feel the product and only then decided to buy the product. These were all not available in online shopping. Also, returning the goods if they didn't like the product was also not a possibility those days. When the above facilities were made available through online shopping, consumers started to show interest in online shopping. They started to buy products and services online, be it books or clothing or cosmetics or services like online entertainment etc. Due to the impact of Covid19 pandemic, there is a huge change in the buying habits of the consumers. This study was conducted in two stages and aims to investigate the online shopping habits of consumers in Chennai city before the outbreak of Covid19 pandemic and during the Covid19 pandemic. The study focused on the variables like number of times consumers shopped online and the amount of money spent for online purchase as well as other variables like availability, price, choice and delivery options. It is found that there significant difference between online shopping habits before and during the Covid19 pandemic.

***Keywords**: Online shopping, Covid19 pandemic, convenience, availability, delivery*

Introduction

The World Wide Web has created a sea of opportunities for both the marketers and the shoppers making it easy for both of them to sell and buy respectively in the online marketplace. Online marketplace is an easy solution to the otherwise busy life of consumers these days. From the time online shopping came into existence in the mid-1990s in the US, it has gone through lot of ups and downs. Many online marketers like amazon, ebay started with selling books and movies had to go through lot of hiccups to sustain in the US market itself. Each online marketer had a story to tell. In the late 1990s, in India, the first online marketplace called the "Fabmart" was started, which at that time was considered a breakthrough in the marketing of goods. Fabmart had to do everything, from listing the products in the website to ordering to payment to delivery of products to consumers, by itself. It was a reasonable start for the company but could not sustain as money was not coming as easily as conceived. The company had to be sold to Birla group in 2003. This was the humble beginning of online marketing in India. Many other online marketers came into existence but soon shut shop because of low patronage. Indian consumers always wanted to see, touch and feel the product before their purchase which was not there in online shopping experience. Also, Indian consumers never had the choice of returning the product if they didn't like it, as no reverse logistic facility was there at that time and it took lot of time to process the returned goods and repay the consumers. So Indian consumers were hesitant to buy products online. There were only around three million internet users during the early 2000s, which was also another reason for the initial failures of online retailers.

The situations has changed drastically in the last ten years. From flipkart buying letsbuy.com, amazon taking over junglee.com, competition in the online retail space started to fire. Due to the emergence of smartphone, the number of internet users have now reached around 620 million from a mere three million in the early 2000s. This also paved way for consumers looking for best deals in online marketplace from wherever they are. Most of the online retailers today use the latest technology for listing their products in catalogues, use secure payment systems, make on-time delivery of goods and have a very efficient return policy. Some of these online retailers cater to consumers in around three hundred cities in India. From books and movies sold online in the early 2000s to more than twenty million products in their

catalogues, online retailers sell everything now. Despite consumers buying from the traditional stores, many find online shopping to be convenient, time saving and with better deals.

Globally, ecommerce industry is worth around $2.29 trillion in 2018 (John, 2018). In India, the ecommerce industry is growing exponentially over the last ten years, from around $10 billion in 2011, its worth in 2020 is around $65 billion (Statista, 2020). Some of the reasons for such huge leap in the growth in ecommerce are large increase in the internet usage, adoption of latest technologies by both the consumers as well as marketers, innovative business models and secured payment systems. Nowadays consumers buy anything and everything through online shopping, from books to movies, from consumer durables to first or secondhand automobiles, from clothing to footwear, from cosmetics to baby care, from groceries to fruits and vegetables, from taxis to food, etc. Consumers shopping behavior has changed over the years. There is a need to better understand this change in behaviour of consumers so that the online marketers can make positioning of their products with the consumers better.

Due to the impact of Covid19 pandemic, Indian ecommerce sector is going to grow by 84% to around $111 billion by 2024 (Business Standard, 2021). The covid19 pandemic has created a huge change in the buying habits of consumers prior to it and after. According to a McKinsey & Company report (2021)around 75% of consumers whom they surveyed have tried a new shopping behavior and would stay put with that beyond the crisis. Many of the consumers switch loyalty towards brands for better deals and convenience.

Review of literature

In India, there were around 150 million online shoppers in 2020 compared to around 135 million in 2019. According to Business Standard (2018) report, more than 120 million Indian consumers are expected to do online shopping. From these data, it is clear that the number of online shoppers in India is growing at an exponential rate. In the same report, even in 2017, there was an increase in the number of times the online shoppers shopped for goods like apparel and accessories, beauty care products etc.Partuti et al., (2019) have found that most of the respondents in Indonesia shopped online less than five times in a month. But in India, in 2015, among those who purchase online, around 12% purchase daily, 33% purchase weekly and 33% purchase monthly. This increase is seen as the result of better online business models. According to a research by Rakuten Insights (Statista, 2021), 28% of the respondents surveyed for the research used online shopping to buy goods less than once a month, 23% bought goods online once or twice a month, and majority of those surveyed shopped online for more than twenty times a month.Also, according to the Business Standard (2018) report, in 2017, popular categories like clothing and accessories, cosmetics and personal care products, footwear and electronic goods accounted for higher consumer spend online. The frequency of purchase has also increased for these categories by a minimum of 35%. DealSunny's (2016) research on spending behavior in India found that around 70% Indians spend less than Rs. 2000 per month in online shopping. Also, among those who shop online, it's the married women who shop the most online. When compared to South Indians, North Indians spend more money for online shopping. As per their findings, income is a determinant for online shopping. As the income level increases, the amount spent on online shopping also increases.

In traditional physical stores, consumers have to go to the shop check for the products of their liking and if it's not available then they have to go to the next shop to check whether the product is available there and so on. Online shopping is so simple that consumers just need an internet connection, a smartphone or a computer and some time to browse the catalogue given by the retailer and check about the products of their preferences. Online shopping is convenient for the consumers as its less time consuming, flexible and requires less physical effort (Darian, 1987). Online shopping is so beneficial for the consumers as they can shop anytime, order anytime and also the goods are delivered at their doorstep anytime (Robinson et al., 2007). Consumers need to spend some time sitting in their couch at home and find the products availability. These days

many online retailers have products ranging from clothing to footwear, from taxis to food, from groceries to fruits and vegetables, everything is available online. For quality and pricey goods, there are some online retailers, for cheap and one time use goods, there are some online retailers, for trendy and fashion goods, there are some other online retailers. Not like the traditional physical store, where customers had to go in search of their preferred brands and products in various shops, online stores provide the opportunity to consumers to search and find their products in a single platform. In traditional shops, because of the impact of Covid19 pandemic, the availability of products and brands of choice has reduced, as they carry only those items which are mostly bought by customers and won't take risk of products being kept unsold in their inventory. But it is not the case with online store, where they normally keep less inventory with them but have partnership with many sellers for different product categories and brands.

Prajapati (2021) found that even though the main purpose of online shopping is the availability of wide variety of products, it's the price discounts which increases the probability of purchase by the consumer. Price is one of the major determinant of preference towards online shopping (Yin & Huang, 2014). If consumers think that they are getting a discount, they will be more inclined to purchase the product.On-time delivery of the products purchased and without much extra cost is also another reason why consumers seek to buy products online. In a survey done on US consumers, Romaine (2020) found thatnearly 44% of consumers said that they would love to get their products delivered within two days from the day of order. The lockdowns announced in different parts of the country and specifically to major cities in India due to the Covid19 pandemic has impacted the delivery time for online retailers. And in some cases, only essential items were allowed to be delivered online. Also, the unavailability of the traditional stores for most part of the day has put the pressure on the online retailers.

Also, during this Covid19 pandemic due to government regulations most of the traditional shops cater to customers only during a certain time period of the day. Customers throng to buy goods, in these traditional shops and so many customers fear going to shops and buy goods. It is convenient for these customers to buy good from online retailers. This study is made with an intention to understand the consumers' online shopping habits and check whether there is any shift in the shopping habits of consumers of Chennai city before and during the emergence of the Covid19 crisis.

Research Methodology

This study aims to investigate whether there is any difference in the shopping habits of consumers in Chennai city before the outbreak of Covid19 pandemic and during the Covid19 pandemic. The total number of respondents for the study is 269. A structured, self-administered online survey was done on the target audiences. The questionnaire was developed using previous literature on consumers' attitude towards online shopping. The first part of the questionnaire covers the demographic details of consumers and the second part focused on questions pertaining to the nature of online shopping by the respondents. The questionnaire was given to around 500 consumers who were selected from the city for the study before Covid19 pandemic usingconvenience sampling technique.But only 269 consumers responded to the questionnaire fully. Again during Covid19 pandemic, the same 269 respondents were contacted through mail and were asked to respond to the same questionnaire.The study was conducted in two stages, one during the months of November and December, 2019 and the other during December, 2020 and March, 2021.

Findings and interpretation

The table.1.shows the demographic details of the respondents. Around 60% of the respondents were male and 40% female. Majority of the respondents were unmarried and belonged to the age group of less than 25 years. There were somewhat equal number of students and private/professionals for the study.

Particulars		Frequency	Percent
Gender	Male	159	59.1
	Female	110	40.9
Marital status	Married	99	36.8
	Unmarried	170	63.2
Occupation	Business	23	8.5
	Government employee	8	3
	Private/Professional	110	40.9
	Student	117	43.5
	Housewife	11	4.1
Age	Below 25 years	177	65.8
	26 to 35 years	44	16.4
	36 to 45 years	46	17.1
	Above 45 years	2	0.7

Table.1. showing the demographic details of the respondents

Number of online purchases	Before Covid		During Covid	
	Frequency	percentage	Frequency	percentage
Not at all	36	13.4	-	-
less than 5 times	121	45.0	105	39.0
6 to 10 times	56	20.8	67	24.9
11 to 20 times	22	8.2	60	22.3
More than 20 times	34	12.6	37	13.8
Total	269	100.0	269	100.0

Table.2. Table showing the number of times respondents made online purchase before and during pandemic

From table.2., it can be inferred that there is huge leap in the number of times the respondents made online purchase during Covid pandemic. Prior to Covid pandemic around 13% of respondents have not made any online purchase but all these respondents have atleast made one or more online purchases during Covid pandemic. But, respondents who used to shop online less than five times a month have statistically reduced by around 6%. Also, there is a huge increase of 14% of respondents shopping online for 11 to 20 times a month. Looking at these data, it is clear that there is an increase in the number of times the respondents shopping online.To check whether there is any significant difference in the number of times respondents made online purchase before and during pandemic, a paired sample 't' test is done.

Number of online purchases	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
Before pandemic – During pandemic	-1.130	1.502	.092	-1.310	-.950	-12.342	268	.000

Table.3. Table showing the results of paired 't' test statistic of number of online purchases before and during pandemic

Table.3. shows the mean and standard deviation of the difference scores for the number of times respondents made online purchase before and during pandemic. The mean value (-1.130), which is the difference between the sample mean,and a large t value of -12.342 shows that the mean number of respondents who made online purchase has increasedsignificantly. Also, the mean difference between the number of times respondents made online purchase before and during pandemic is statistically significant as the significance value 'Sig. (2-tailed)' or p (0.000) < 0.05.

Money spent on online purchases	Before Covid		During Covid	
	Frequency	percentage	Frequency	percentage
No purchase	36	13.38%	-	-
Less than Rs. 5000	166	61.71%	178	66.2
Rs. 5001 to Rs. 10,000	46	17.10%	58	21.6
Rs.10,001 to Rs. 15,000	12	4.46%	19	7.1
Rs. 15,001 to Rs. 20,000	4	1.49%	7	2.6
More than Rs. 20,000	5	1.86%	7	2.6

Table.4. Table showing Money spent on online purchase before and during pandemic

From table.4., it can be inferred that there is an increase in the amount of money spent on online shopping during the pandemic. There is a good leap in the money spent in the range from less than Rs. 5000 to Rs. 15000 (from around 83% to around 95%) and a nominal leap in the money spent above Rs. 15000. Paired sample 't' test is done to check whether there is any significant difference in the money spent on online shopping before and during the pandemic.

Money spent on online shopping	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
Before Pandemic – During Pandemic	-.268	1.568	.096	-.456	-.079	-2.800	268	.005

Table.5.Table showing the results of paired 't' test statistic on money spent on online purchase before and during pandemic

Table.5., shows the mean and standard deviation of the difference scores for the number of times respondents made online purchase before and during pandemic. The mean value (-.268), which is the difference between the sample mean,and a large t value of -2.800 shows that the average money spent on online purchase has increasedsignificantly. Also, the mean difference between the number of times respondents made online purchase before and during pandemic is statistically significant as the significance value 'Sig. (2-tailed)' or p (0.000) < 0.05.

Product Category	Before pandemic				During pandemic			
	Frequency			%	Frequency			%
	Male	Female	Total		Male	Female	Total	
Clothing	14	68	82	21.87	-	27	27	5.08
Mobile Phone	47	16	63	16.80	28	24	52	9.77
Laptop & other Electronic components	96	8	104	27.73	56	2	58	10.90
Footwear	10	26	36	9.60	3	17	20	3.76
Groceries	37	-	37	9.87	89	24	113	21.24
Books	14	24	38	10.13	2	10	12	2.26
Fruits & Vegetables	15	-	15	4.00	82	24	106	19.92
Food			-		7		7	1.32
Medicine & Healthcare items			-		32	15	47	8.83
Kids & baby Care			-		-	6	6	1.13
Cosmetics			-		-	4	4	0.75
Online entertainment subscription			-		30	40	70	13.16
Gifts & other items			-		-	10	10	1.88
Total			375				532	

Table.6. Table showing the product category purchased before and during pandemic

From table.6., it can be inferred that many new category of products were purchased during the pandemic than before pandemic. There is an increase of around 41.9 % ((532 – 375)/375 = 0.41867 or 41.9 %) in the products purchased online before and during pandemic.

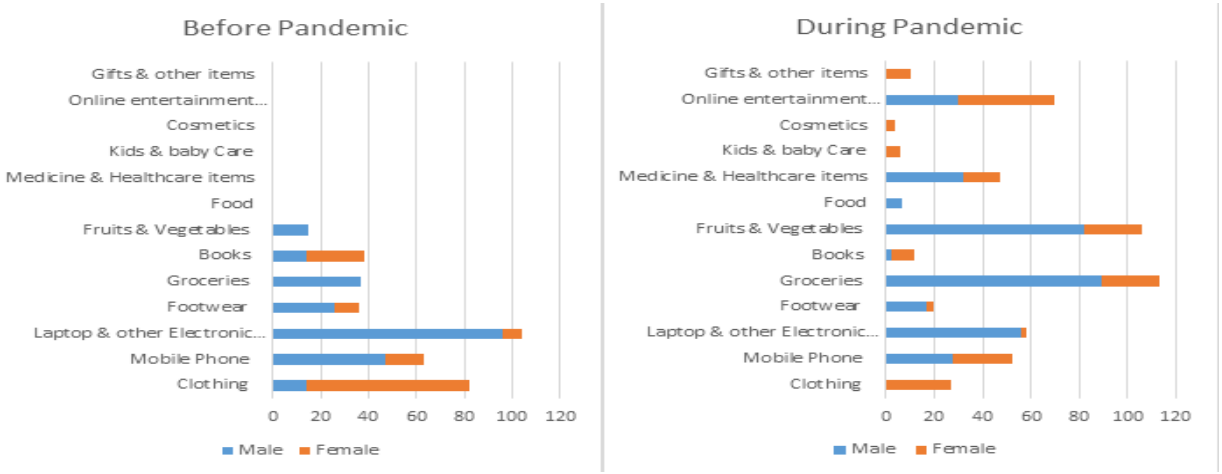

Figure.1. Figure showing the product category purchased before and during pandemic

Clothing, mobile phone, laptop and other electronic items, footwear, groceries, books and fruits and vegetables were the items which were purchased by majority of the respondents through online mode both before and during the pandemic. It should be noted that as many as six new categories of products were purchased online during the pandemic. Medical and healthcare items like, hand and room sanitizers, masks and medicines on the prescription by doctors were the items that were newly purchased by many respondents during the pandemic. Also, a very new category of services, online entertainment subscription like Netflix, amazon prime videos and hotstar were also purchased by many respondents. Other items like food items, kids and baby care items, cosmetics and gifts were the other items purchased during the pandemic. Analyzing the volume of products purchased, it can be easily noted that groceries and fruit and vegetables were the items which saw an increase in the volume purchased. Mobile phone, laptop and other electronic items saw a decrease in the volume purchased. Even though there was a need for these electronic gadgets because of online classes for school and college students, there was a dip in the purchase of these items.

Online purchase among male and female respondents didn't show much of a difference. Female respondents have shown much interest in products like online entertainment subscription, groceries, fruits and vegetables during the pandemic Majority of the purchases on groceries and fruits were by male respondents. . Female respondents have purchased products like clothing, cosmetics, gifts and other items more than male respondents.

From table.7., it can be inferred that there is a significant shift in the reasons to purchase goods online before and during the pandemic. Before Covid pandemic, majority of the respondents preferred online shopping for the reason that it is very convenient to purchase goods online and the availability of variety of products and brands to choose from. The next best reason is that online shopping sold products at a cheaper price and also in many cases sold products at a discount. But the pandemic has made a huge shift in the shopping habits by recognizing that convenience and availability as important factors but also delivery of the products and social distancing are some important reasons for them to purchase online. There is a significant shift of around 20% in the preference of online shopping because of delivery during the pandemic.

Social distancing was included as a factor for preference of online shopping because consumers felt its need during this pandemic. In traditional stores, they have to wait in queue to enter into the store and to make the payment which has safety issues during this pandemic.

Reason for online purchase		Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
Before Covid Pandemic	Convenience	51.30%	40.15%	6.69%	1.49%	0.37%
	Availability	36.43%	55.39%	3.72%	4.46%	0.00%
	Price	52.79%	27.14%	16.73%	1.49%	1.86%
	Choice	37.55%	44.98%	15.61%	1.49%	0.37%
	Delivery	14.13%	32.71%	27.51%	20.82%	4.83%
During Covid Pandemic	Convenience	51.67%	34.94%	4.46%	8.55%	0.37%
	Availability	40.15%	40.15%	8.55%	10.41%	0.74%
	Price	27.14%	36.43%	21.19%	13.01%	2.23%
	Choice	33.83%	35.32%	14.50%	14.50%	1.86%
	Delivery	30.11%	36.06%	15.99%	16.73%	1.12%
	Social distance	47.21%	38.29%	5.58%	8.18%	0.74%

Table.7. Table showing the reasons for online shopping before and during pandemic

Discussion

The research found that there was an overall growth of around 42% in the categories of products purchased through online shopping. Many of these categories found a steep growth led by groceries, fruits and vegetables, home entertainment, medicine and healthcare products. There was a steep increase in the number of times the respondents shopped online during the pandemic showing a statistically significant difference with that before the pandemic. 14 % of respondents who never shopped online before pandemic had purchased products during the pandemic. Also, there was an increase in the number of respondents making online purchase for more than ten times in a month from around 20% to 35%. Also, there was a significant difference between the money spent on online shopping before and during the pandemic. The majority of the respondents spent less than Rs. 10,000 every month on online shopping both before and during the pandemic. The main reasons for respondents to shift to online shopping was for convenience, social distancing and delivery of the product. The pandemic has created a fear in the minds of the consumers that going to traditional retail shops, they cannot just like that enter the shops, pick the products from the shelf and pay and return. Rather they need to wait in queue, look for the products available in the shelf and wait in the queue for payment, which would not be convenient and safe. It is also clear from the study that even though apparels, footwear and other variety of products at a discounted price were all in the offering for the consumers, but during such a crisis situation, it is the essential products like groceries, fruits and vegetables and healthcare products, which the consumers sought. Also, looking at the spurt in the subscription for online entertainment, it is clear that consumers wanted some time off from the daily routine work. As a McKinsey report noted that online shopping is there to stay strong after the pandemic, it is time, that majority of the consumers switch to online shopping in the near future.

Conclusion

Even though the study was conducted in a city with similar characteristics of other cities in India, it needs caution in generalizing the result to the entire population of India. Since, the respondents considered in this study were users of the internet, there should be a disparity between the respondent of the study and the general population. In future studies, researchers may examine the effect of factors influencing online shopping behavior towards satisfaction and loyalty.

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POSITIVE AND NEGATIVE IMPACT OF LOCKDOWN ON SCHOOL STUDENTS' EDUCATION IN INDIA DURING 2020-21 – A STUDY

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ABSTRACT

Educational sector is recently facing an unprecedented challenges and changes. The pandemic has brought the functioning of schools and colleges to a halt. School Students or Teachers are made to adapt to on-line modes for their teaching and learning. They are adapting to various platforms available on-line. This paper highlights the impacts of online learning on school Students. Teachers are using various platforms like Zoom, Go to meetings, Hangouts and Google meet to conduct their classes and share their study materials. However, there are many issues like availability, access, affordability and convenience that are affecting the on-line teaching & Learning. School Students are stressed on account of various things like new technology with no know-hows and informal set-ups of learning. Lack of interaction with teachers and peers is impacting their learning and development. This will have a consequence on their results. Examination and Evaluation is a major cause of concern. Technology however cannot replace teachers but started to play a vital role in the education and its development. The impact of online teaching is going to be long-lasting in the field of education. Many Schools have started to use many digital facilities to conduct their on-line classes. They have started to adapt to the new digital opportunities available and are pushing their teachers to adopt as well. Virtual teaching and learning have reached a new height and is creating a new course for the feature. This paper throws light on the positive and negative impact of online learning in School education during this pandemic.

Keywords : *Pandmic, teaching and learning, school students, opportunities and challenges*

1.1 Introduction

Technology is an unbiased tool, in standings of receiving the kids occupied together and encouraging them, the instructor is the utmost significant – (Bill Gates)

Currently children are completely disconnected withthe physical classroom learning. Online teaching and learning are playing a vital role in the country's education system. The pandemic has made schools shut for more than a year now. Government had decided to close all the schools and the decision must be appreciated because no one can risk the life of children and hence the closure was inevitable.

Computer and Internet connections are already making dynamic changes in the society. Now they are providing both the School Students and teachers with better opportunities to adapt to new modes of learning and teaching to cater to their individual needs hence the school managements are aptly responding to this technical innovation. Failing to continue the children's learning will hamper the learning cycle and will have a huge detrimental effect in the development of children.

Computer and internet technology are already providing tools and techniques for extending human capacities. They have already impacted the way we communicate. The mobile phones enable us to speak to people thousands and thousands of kilo meters away. We can not only speak but can also have a video discussion with them. Mobiles are also transforming various aspects of life like online purchases, browsing and entertainment etc., Televisions enables us to see what is happening on the other side of the world almost as it happens. Web impacts quicker and faster access. Information, opinions and interests are shared in the fastest way possible. Now these facilities are being used in the field of education. Computer and internet facilities are used to off-load teaching and communicate to the children. Current situation has made the schools and teachers to adapt to these technologies to cater to their needs of reaching the School Students at their residence. Many schools have invested in the technological infrastructure to build their online teaching capacities.

There are positive and the negative aspect of online teaching and learning. The positive impact is that because most of us are stuck at home allows us to adapt personalized learning. Teachers can personalize tools and support the School Students using the better uses of online

resources. The teachers are better equipped to understand the needs of the students. For example, teachers can use the functions like chat and so forth. School Students who don't tend to speak can ask questions using these features. Teachers are now better equipped to measure the understanding level of different students. In a way, technology can make it easier for struggling students to signal their need for help and seek guidance. They can also for example, get the opportunities to revisit the whole session using technology like watching the recorded version of the classes etc.,this will give more time to the students who are slow to digest the subject and who learn subjects at a relatively slow pace.

1.2 Positive Impacts of Online Learning

This online learning has its own influence and the discussion about the positive impact of online learning is essential. It also shares the aspects related to online learning which is positive in nature.

1.2.1 Increase in Teacher / Student Efficiency

Student's perspective of online learning is that it allows them to adapt more flexible ways of learning. They can get the recorded version of the classes and revisit the sessions later at the choice of their time and place. This helps them to take their own time to understand the concepts. As they are already connected to the Computer and Internet facilities, they can use browsing facilities to get additional information about the subject taught. This cultivates competency and learning skills among School Students thus increasing their efficiency levels.

1.2.2 Unlimited Resources

Online Learning offers the student the flexibility of time of place for receiving the learning information. In an e-learning environment various tools and technologies are employed such as digital teaching, web-based education, TV and radio broadcast, Virtual Classrooms, audio chatting and video conferencing and on-line discussions. Nearly 90% of teachers received professional development through ICT tools. This in a sense breaks the physical boundaries required for teaching and learning.

1.2.3 Time Saving

Online learning gives the liberty of getting away with the premises for both the teachers and the students. This saved time helps both the parties to spend more quality time in teaching and learning. This is also true with the parents who spend time for their children to drop and pick up from the school. This is a new win-win situation for all.

1.2.4 Quality Learning

In the on-line teaching, teachers are inclined to use digital materials to aid learning. This has provided the best platform to provide extensive and high-quality learning materials to the student. It helps the teacher to build quality knowledgebase, expand children's skills-set thereby enriching their lives through expanded knowledge. The teachers can also use recorded materials; provide online links to the School Students to clear their doubts etc.

1.2.5 Embracing New Technology

Online has made the teachers to think and deploy new methods of teaching and evaluating the students. This is because of the need to teach virtually. Teachers are hence adapting to sophisticated technologies. As are result School Students are getting the taste of modern learning which is helping them to future ready to embrace advanced technologies

1.2.6 Learning through Digital Games

School Children are exposed to computers through educational games. Instead of playing board games that focus on education, School Students can learn the basics of spelling, counting and other early educational lessons through computer games that are making learning more fun.

1.2.7 Online Engagement

Schools are arranging for Web Seminars and other live programs to aid the extra-curricular learning of the students. As these are done online, they can get very quality resources like scientists, doctorsand other distinguished personalities. School Students are hence getting these platforms to learn and interact with these famous personalities. This is helping to a great extent shape the quality of children in a big way to improve their quality

1.3 Negative Impacts of Online Learning

While online teaching has significant strengths and offer unprecedented exposure to quality education, there are weaknesses associated in the use of this medium that can pose potential threats to the children's psychology and behavior development

1.3.1 Lack of Technology Know-How

Some School Students do not have the resources to access the online learning environment. Lack of access whether it is due to economical or logistics reasons will have a disastrous impact on the learning and development of such students. This is frequent in rural and lower socio economic section of the society. From the educational institution's point of view, if the School Students cannot afford the technology the schools lose these children and this is the reason why we have seen a surge of School Students joining government schools.

1.3.2 Lack of Computer Literacy

Both School Students and the teachers must possess a minimum level of computer knowledge to function successfully in an online environment. For example, they need to be talented to use a range of exploration engines and be calm and steering on the internet. If they do not possess these technology tools, then their chances of succeeding are very bleak. This is also true for those students whose parents do not have computer literacy.

1.3.3 Impact on Student's Interests

Online method of education is highly effective for mature and disciplined student while it may be in appropriate for other students who need regular pampering from their parents. Online education gives students the control over their learning experience and allows for flexibility of study schedules for nontraditional students; however, this places a greater responsibility on the students. Students who are dependent learners and have difficulty taking responsibilities will lose out on the benefits and have the risk of losing their interest in studies

1.3.4 Lack of Expertise

Online education needs essential expertise from the teachers. As this is a new phenomenon, it has taken considerable time for the learning curve to complete. Teachers are now adapting to the new technologies and methodologies to improve their quality of teaching. There is a heavy pressure on the teachers to ensure that the students are engaged in their classes and not feel the absence of physical classroom environments. Students on the other hand get completely disengaged if they do not feel the connect with the teachers during the class sessions

1.3.5 Lack of Mutual Feed Back

In the school &classrooms set up the teachers have the time and opportunity to provide feedback to the students on their mistakes and doubts, whereas in an online setup there is limited time and resources to do so. Similarly, students can reach out to the teachers in person to seek clarity on their learning during the office hours, while this is not possible in an online teaching method. These feed backs and discussions go a long way to influence the student's motivations while the absence of the same has negative impact on some of the students. Technological advances to provide constructive and regular feedback is yet to be developed in the online modes of teaching.

1.3.6 Lack of Interpersonal Skill Development

Proper classrooms provide a basic and most effective environment for the students to improve their communication skills. Peer group learning improves their maturity and interpersonal skills. An online environment takes away this benefit completely. Students of parents with less literacy are highly prone to this drawback.

1.3.7 Stress on Working Parents

Online education brings a heavy stress on the families where both the parents are working. In most of the cases the parents find huge difficulty in coping up with their jobs and managing to help their children.

1.3.8 Addiction to Technology

Online education has the potential to create a sense of addiction among the students and teachers towards the technology. Online education is more theoretical and lacks the benefits of face-to-face communication. There is a high chance that the teachers and students get addicted to the comforts of technology and may not return to the traditional teaching and learning mindsets. Apart from these there are also the physical and psychological side effects due to extensive use of these Computer and internet technologies like reduced sleeps, eye-sight problems, depression, migraines, improper eating habits and other digestive problems.Technology addiction is a growing health risk in the child and adolescent population which needs proper research and interventions.

1.4 Need of the Study

Any study relating to Positive and Negative impact of lockdown on children's education in India. Lockdown has completely changed the outlook of the children's education as previously the children were used to Offline classes, as students are still not come out fully from the Covid 19 scenario. Hence this study elaborates the pros and cons of lockdown and its impact in children's education during 2020 – 2021. This has been elaborately discussed by the researcher which is considered the need of the hour.

1.5 Objective of the Study

- To study the Positive and Negative impact of lockdown on children's education
- To find how online classes equally compensated by using ICT tools
- To identify the factors which missed by the students during lockdown

1.6 Research Methodology

1.6.1 Data source

From Primary data and Secondary data the data has been collected for the study. Primary data was collected mainly through well structured questionnaire using Google forms. Secondary data has been obtained through research papers, journals, blogs, books, magazines, research papers and websites.

1.6.2 Research design:

Google forms were used to collect data from the school students. The questionnaire was designed, keeping in view the objectives of the study.

1.6.3 Research sampling

Structured questionnaire was prepared. The questions were sent through Google forms to all students studying in both private and public sector schools. Snow ball sampling technique was used.

1.7 Analysis and Interpretation

1.7.1 To study the Positive impact of lockdown on children's education

Where dichotomous questions (Yes, No) were asked. Table 1.1 shows the results which are tabulated.

Table 1.1: Positive impact of lockdown on school children's education

Positive parameters	Yes	Percentage	No	Percentage
Increase in Teacher / Student Efficiency	34	68	16	32
Unlimited Resources	16	32	34	68
Time Saving	40	80	10	20
Quality Learning	27	54	23	4
Embracing New Technology	45	90	5	10
Online Engagement	46	92	4	8

Source: Primary Data

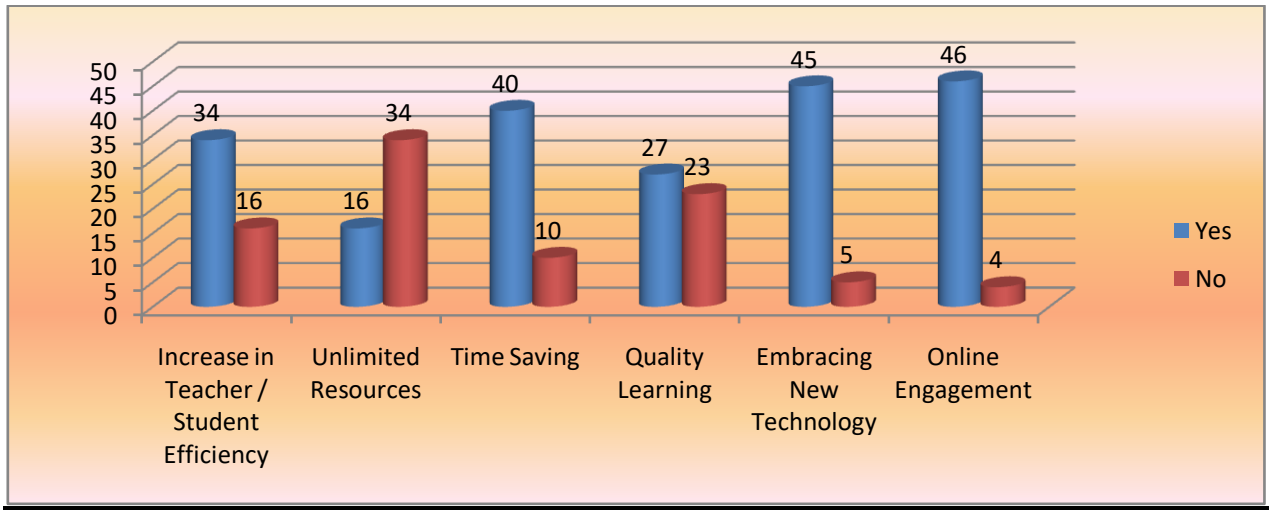


Fig. 1.1 indicates the parameters of Positive impact on lockdown on students' education

Inference

Table 1.1 reveals that nearly 92 per cent of students felt they an able to engage online classes and nearly 80 per cent of students felt that it is "Time Saving method"

1.7.2 To study the Negative impact of lockdown on children's education

Where dichotomous questions (Yes, No) were asked. Table 1.2 shows the results which are tabulated

Table 1.2 Negative impact of lockdown on school children's education

Negative parameters	Yes	Percentage	No	Percentage
Lack of Technology Know-How	27	54	23	46
Lack of Computer Literacy	34	68	16	32
Impact on Student's Interests	40	80	10	20
Lack of Expertise	39	78	11	22
Addiction to Technology	47	94	3	6

Source: Primary Data

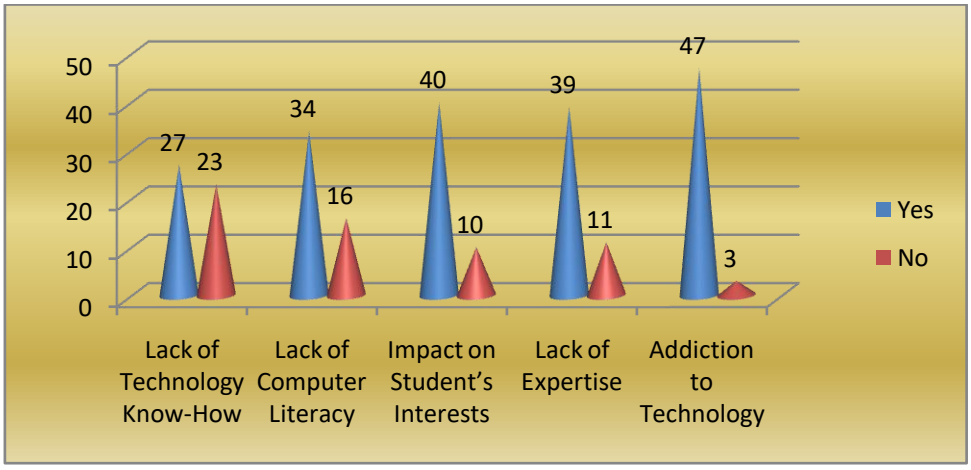


Fig. 1.2 indicates the parameters for Negative impact on lockdown on students' education

Inference

Table 1.2 reveals that majority of 94 % of students felt now addicted to using of technology and nearly 80 per cent of the students felt that these online classes affect the learning interest of the students.

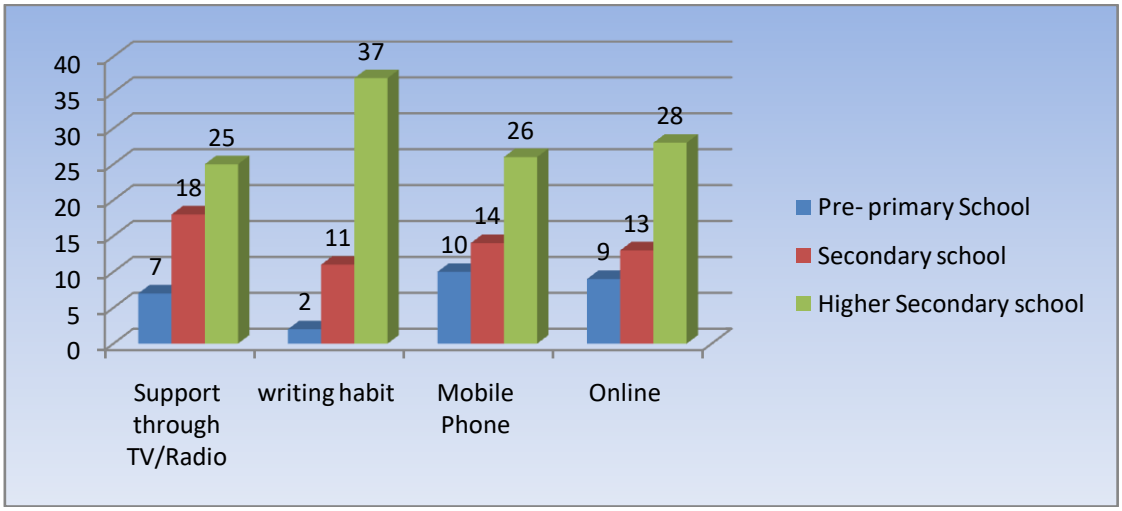
1.8.3 To study the Negative impact of lockdown on children's education

Where dichotomous questions (Yes, No) were asked. Table 1.3 shows the results which are tabulated

Table 1.3 Indicates the factors which missed by the students during lockdown

School Type	Support through TV/Radio	writing habit	Mobile Phone	Online
Pre- primary School	14	4	20	18
Secondary school	36	22	28	26
Higher Secondary school	50	74	52	56

Source: Primary Data



Source: Primary Data

Fig. 1.3 indicates the factors which missed by the students during lockdown

Inference

Table 1.3 reveals that, majority of 74 per cent of students felt that their writing habit reduced in this lockdown online teaching method. And nearly

1.9 Conclusion

The current situation poses significant face of challenges of both positive and negative impact on education and social systems in the countries of the region that must be addressed in a coordinated manner. It also bargains valued educations on the actual urgencies of lifetime as part of a communal. Today, these encounters and teachings bid the panorama of reconsidering the determination of teaching and its role in supporting human lifecycle and self-esteem, so that no one is gone over due. In other arguments, as nations reflect the best method to challenge in decisions and revive their schooling institutes safety, this disaster delivers an extraordinary chance to surge the elasticity of over-all teaching organizations and alter them into impartial and comprehensive schemes that assist to achieve the shared promise finished for justifiable growth.

Utmost care must be used in technology adoption. It is important to figure out relaxation techniques that will reduce the technology burn out among students and teachers. This may include indoor games, get-togethers etc., too much exposure to computer and internet gadgets will have adverse impact on the physical, emotional and psychological wellbeing of the students. Having understood the future role of technology in the education sector researches must be initiated to discover intervention strategies for the wellbeing of students and teacher fraternity.

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ONLINE EDUCATION AND ITS EFFECT IN THE POST COVID -19

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ABSTRACT

Students and educators in any respect tiers of schooling were forced to quickly adapt to on-line gaining knowledge of because of the coronavirus pandemic. The ramifications of this — and the modifications required to make it work — should have a long time period effect on how schooling is provided. In the past, e-gaining knowledge of changed into underutilized, mainly in underdeveloped international locations.The gift COVID19 pandemic, however, has forced the whole international to depend on it for schooling. Students and educators in any respect tiers of schooling were forced to quickly adapt to on-line gaining knowledge of because of the coronavirus pandemic. The ramifications of this — and the modifications required to make it work — should have a long time period effect on how schooling is provided. First and foremost, the COVID19 epidemic is a public fitness emergency. Many international locations have determined to shut schools, colleges, and universities The state of affairs encapsulates the issue that politicians have in finding out whether or not to shut schools or not.

Keywords : *COVID19, Education, Pandemic, Online, Ramification*

Introduction

Scholars and preceptors at all situations of education have been impelled to snappily acclimatize to online literacy due to the coronavirus epidemic. The ramifications of this — and the changes needed to make it work — could have a long- term impact on
how education is handed. The COVID-19 epidemic has impelled the entire world to embrace virtual literacy. While online and remote literacy are employed within the history to make sure educational durability, like within the fate of earthquakes1, the present situation is unknown in compass. Enterprise has now begun as to what the long- term consequences will be, as well as what education will look like in the post-COVID age. For some, a return to the factual classroom's traditions is essential right down. Others, on the other hand, see the forced shift to online education as an occasion to reevaluate how education may be delivered.
These forerunners to ultramodern online education used educational design principles — the methodical process of applying cerebral principles of mortal literacy to the creation of effective educational results — to consider which styles (and their corresponding literacy surroundings) would effectively engage scholars to achieve the asked literacy issues. In other words, they explored what choices about literacy experience planning and perpetration can lead to pupil success. Similar early educational improvements laid the frame for moment's virtual literacy, which encompasses a wide range of educational methodologies and delivery formats.

Online Education and the Epidemic

Fast forward to 2020, when a slew of new educational improvements has surfaced, paving the way for wide acceptance of remote literacy. Access is a major issue. There are still other issues then, including a lack of Internet connectivity in some areas, particularly pastoral areas, and contending requirements among family members for home technology use.
The epidemic of COVID-19 is also likely to have a long- term impact on assignment planning. Due to the epidemic's limits, preceptors were suitable to probe innovative ways for tutoring specific ideas. Though the process of redefining educational approaches was rushed, it handed a rare occasion to review strategies that stylish help literacy within the affordances and limits of the online terrain. Greater variation in tutoring and literacy conditioning, in particular, will continue to cast mistrustfulness on the value of' seat time ‘as a criterion for awarding educational credits. 10 — long Drone sessions are infrequently instructionally essential and don't follow the

cerebral laws of mortal literacy. While it's necessary for scholars to interact, forcing them to interact only for the sake of interacting is neither motivating nor productive.

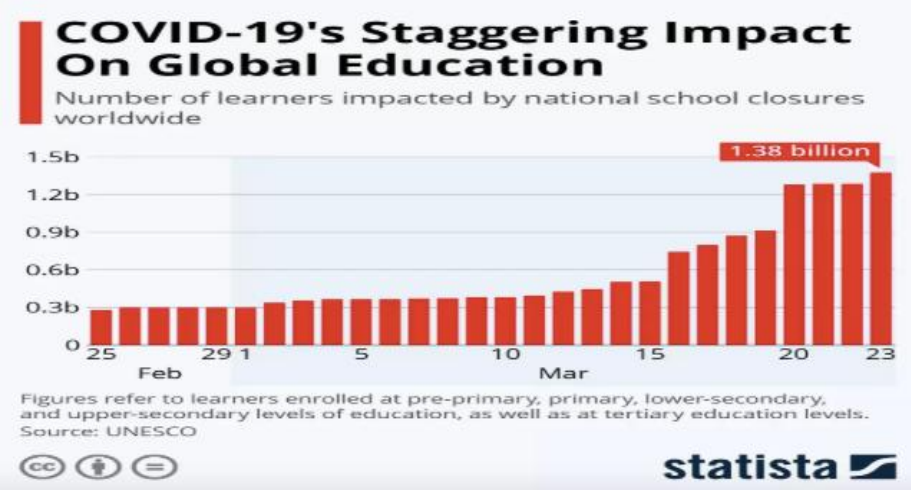
Changes need in Post COVID-19

- Outbreak of the COVID-19 Pandemic, have embraced many educational institutions to undergo online education platform. This lead to experience a huge and rapid transformation among the teaching partner, learning partner and overall education world.
- With e-learning web apps, teaching partner can provide effective virtual classroom to the beneficiaries.
- Identify the need of the students and identify the current need of the industry. Then find the gap to map and list the strategies.
- Identify the expectations of the students from teaching partner and also identify the expectations of teaching partner from students, then find the gap to map and list the strategies.

Some of the Action Plans to make virtual classroom effective are:

a. Role plays
b. Case Studies/ Story creating (Assigning students to write small case studies on history about small businessman in their local area or in their families/ relatives/ friends).
c. Simulation exercises (Like conducting Board meetings, Annual General Meetings, recruitment, selection process by assigning the students with different roles like CEO, President. Manager and so on).
d. Presentations (Asking them to create their own presentations for their own dream product or service and can assign them to create business model using apps).
e. Digital Marketing app
f. Content Writer assignments
g. Quiz

Education sector responding to Covid-19- SOURCE: UNESCO



Some of the web apps that could be tried are:

Prezi – presentations

a. Think link – for teaching partners
b. Story bird
c. Animoto – create own marketing videos
d. Edu creations – own videos on subject content can be done

Benefits of eLearning for Learners

There are numerous advantages to eLearning, and this text covers a couple of of them from the standpoint of a learner or student. Online learning, often referred to as eLearning, may be a paradigm shift far away from traditional classroom learning and toward a more convenient and effective technology – based learning model.

In recent years, the pandemic has demonstrated both the expansion and usefulness of eLearning. From the comfort of their own homes, learners can access relevant, self-paced, personalised.

- Lectures are often Taken Any Number of Times & eLearning Is Cost-Effective
- Makes A Positive Impact on the Learner **&** Longer Knowledge Retention
- Flexible Learning Environment **&** Smooth Pursuit of Knowledge While Keeping Everything Else Balanced
- Learner Feels More Comfortable**&**Easy Communication and Improved Teamwork
- Makes Learning Stress-free **&** Accessibility and Flexibility
- Learner Feels More Engaged **&** Pre-Tests for Exam Preparation
- No Miscommunication **&** Assessments
- Up-To-Date Learning Content**&**Easy Accessibility to Learning Content

Impact of E-Education during COVID-19

During online education, both professors and students face numerous challenges. During teaching, there is a shortage of basic facilities at home, as well as external distractions and interruptions from family members. were major flaws discovered. Barriers to educational institution funding, such as the funds for acquiring sophisticated technology, a lack of training, a lack of technical support, and a lack of financial resources. There was also a lack of clarity and direction. Teachers had to deal with technical issues as well. There is a lack of technical support encompassed a variety of issues, including a lack of technical help.Teachers' personal issues, such as a lack of technical understanding and course integration with technology, limit their willingness to teach online

Positive and Negative impact

- Apart from the fact that the outbreak of COVID-19 had a negative impact on education, Indian educational institutions are recognizing the challenges and are doing their best to provide students with support services during the epidemic. India's education system now has the opportunity to change from a traditional system to a modern one. The following are some of the positive effects that can be tested.
- Improve the use of sensual copy reading materials- Because students were unable to collect solid copies of the material at the time of closure, most students relied on soft copy materials for consideration.
- Improved collaboration - there is a new opportunity to teach and learn collaboratively that requires new forms.
- Increased use of online conferences- The epidemic has resulted in a dramatic increase in the use of teleconferencing, visual conferences, webinars, and e-conferencing. Digital learning has proliferated as a result of the epidemic, which has enabled individuals to access and use digital technology.
- Improved use of social media for sharing information - Learning materials are easily shared among students, and related questions are answered via email, SMS, calls, and various social media platforms such as What Sapp or Facebook.

Consequences for the tutorial system:

The outbreak of COVID-19 has wreaked havoc on India's educational sector. it's had numerous detrimental effects on education, a number of which are listed below:

- Educational activity has been suffering from the closure of faculties and therefore the suspension of classes. Across India, various boards have already postponed annual examinations and admission tests. Teachers and students are unprepared for online education; they weren't prepared for this abrupt move from face-to-face to online learning.
- Parents' role: In urban areas, some educated parents can guide their children, but others may lack the required education to show children reception.
- Make a Difference: This online teaching-learning method generates a big divide between rich and poor students, also as urban and rural students.

Conclusion

these epidemic responses will change from one location to the next and in other settings. They must, however, focus on the human vision of education and learning. Fundamentals of development and human rights Steps must be taken to enhance public education. Strengthen commonweal s and promote global cooperation that prioritizes common good. Education for all is a universal responsibility. The decisions made

today after the outbreak of COVID-19 will have a long-term impact on education prospects. The International Commission on the Futures of Education presents nine key perspectives on the COVID-19 crisis and its implications in this report, stating that as the economy, communities, and education systems face unprecedented disruptions, we must rest on our core values and strengths. Social and social interaction should be a priority during the rehabilitation and rethinking of education. This should go hand in hand with a commitment to international unity that rejects the ever-present inequality

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LIFE AFTER COVID-19 PANDEMIC TRANSFORMING BUSINESS ENTITIES

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ABSTRACT

COVID-19 Pandemic has changed the perspective of the business world. Executives have come to a mindset that when everything is a priority, nothing can be prioritized. When executives in global business arena are struggling to make sense of the post-COVID business environment, many find themselves leading from this gray area of indecision. Few years ago when priorities for executives were crisis management, enterprise agility, cost management, workforce resiliency, innovation, or cash-flow management as critically important to their business. Today, however, top executives tell a different tale. New research from the IBM Institute for Business Value shows that, far from prioritizing no particular capability, executives are prioritizing all these capabilities. In the next two years, these findings show the world should be prepared with another huge shift in prioritization. Executives are clearly telling that they plan to emphasize workforce safety and security, cost management, and enterprise agility.Post Covid-19 the business word would be restructured with changed talents required, priorities and workforce management. This article is througing light on how the business world would be reshaped and redesigned to face unforeseen challenges as we faced during COVID-19.The business world is preparing for the next unforeseen challenge.

Keyword: *Business models, Strategies, Priorities, Future trends*

Introduction

Global economy has come to a standstill with the impact of COVID-19 spread all over the globe. Each continent is no excuse for the impact of this deadly virus which has its shades all over the universe. No country is an excuse for this deadly uninvited and unpredicted guest. Each country is working full pace to recover its lost fame and name. Medical practitioners are struggling hard to stop this deadly virus spread further, economists working on how to balance the global economy, financial experts on recovering loss in financial market, educationalists working on how to work on further digitalized education system, manufacturers working on developing business, SME`S working on regaining their customer satisfaction etc. this deadly decease I not going to stop for another year is the opinion of WHO chief. As per the instruction given by WHO maintaining distance and hygiene is the only possible solution to stop this decease take its full swing further on any nation.The corona virus outbreak is not the first and foremost human tragedy. In 1918 French fever took a tool of 5 million people, affecting millions of people. It has been described as the biggest global event and challenge for humankind ever recorded. It has a growing impact on the global economy.

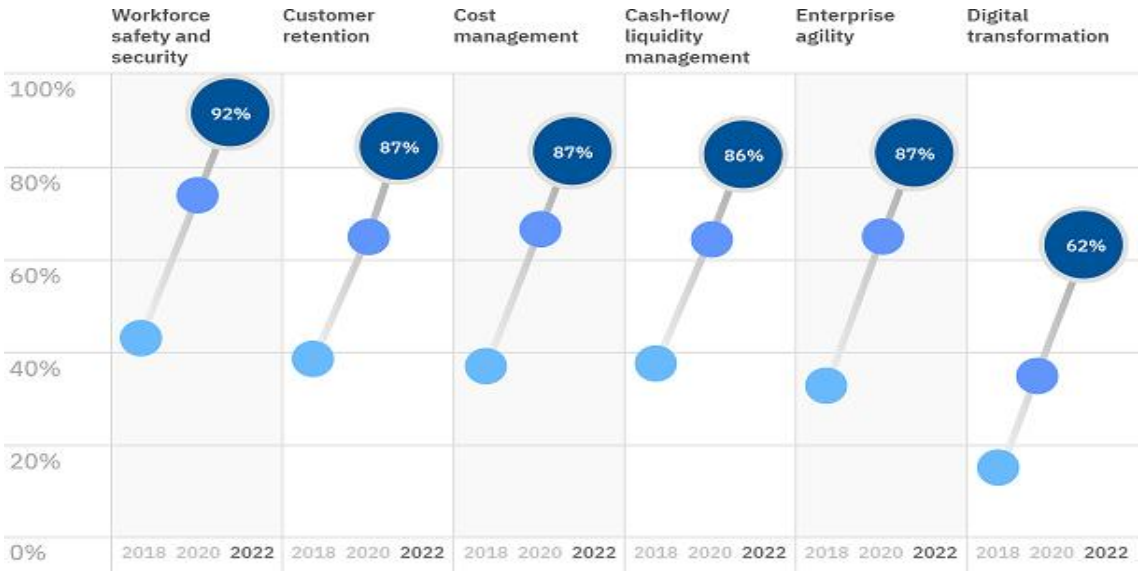
If we question how we arrived at where we currently are – the plausible answer is 'we are here because human greed, selfishness and profiteering took priority over humanity, sustainable solutions and the ability to share and protect our natural resources and communities'. Over the past five decades developments on the economic and business fronts was swift – in the 1970s markets began to grow aggressively, in the 1990s was the booming of the internet age, in the 2000s there was increase in social media and exponential growth and today we are fighting for humanity's survival.

Facts: Impact on Business organization

- It is an inevitable reality that the COVID-19 pandemic will have an impact on business organisations.
- The extreme lock-down measures and related restrictions has inevitably resulted in unique challenges experienced by both human beings and business organisations in general.
- There is ample evidence that the Covid-19 pandemic has changed the face of human society. Human behaviour will never be the same again.
- There are far reaching consequences which will require business organisations to transform and repackage themselves for the post Covid-19 era.

Changing Priorities

Executives' top priorities are shifting dramatically as they plan for an uncertain future.



Business Work Style Redefined

Organizations made big changes in response to the pandemic—and there's no going back.

Shifted to more cloud-based business activities 64%

Accelerated process automation 60%

Adjusted their approach to change management 60%

Made permanent changes to organization strategy 55%

Executives changed their thought process in trusting more on what technology can do, and they are pushing ahead with digital transformation. They indicate they are planning for COVID-19 recovery to include investment in technologies such as AI, IoT, blockchain, and cloud. The benefits long extolled by technophiles have become more broadly embraced across organizational leadership. To stack the deck for success, organizations need to be sure their people are as capable, resilient, and adaptable as their technologies for the long term.

• **PRE Covid -19**	• **Post Covid- 19**
• **Profit**	• **Sustainability**
• **Management**	• **Ethical Leadership**
• **Self-interest**	• **Creating value for customers**
• **Reliance on limited modes of communication**	• **Creation of multiple modes of communication**
• **Pre-defined work**	• **Customised work**
• **Face-to-face interaction**	• **Combination of face-to-face & virtual interaction**
• **Focus on qualifications**	• **Focus on competencies**

As we have studied mankind Before Christ and After Christ our future generation would study the life style of Human being before corona and after corona. The business which never thought of going online are forced to take up online business services.

Organizations which aimed on profit targets are in a position to sustain their existence. Business which had a wide spread customers all over the globe are restricted with limited resources as whatever is possible work from home is in process . Organizations who depended on limited modes of communication are now working with multiple modes of communication, who were very rigid with predefined work culture are now going with customized work. What they had as client meeting in hi-fi conference halls is going on as

virtual conference calls. Competencies of workers who are capable of working with the present infrastructure are given priority rather than qualification

Future of the Business – After COVID 19

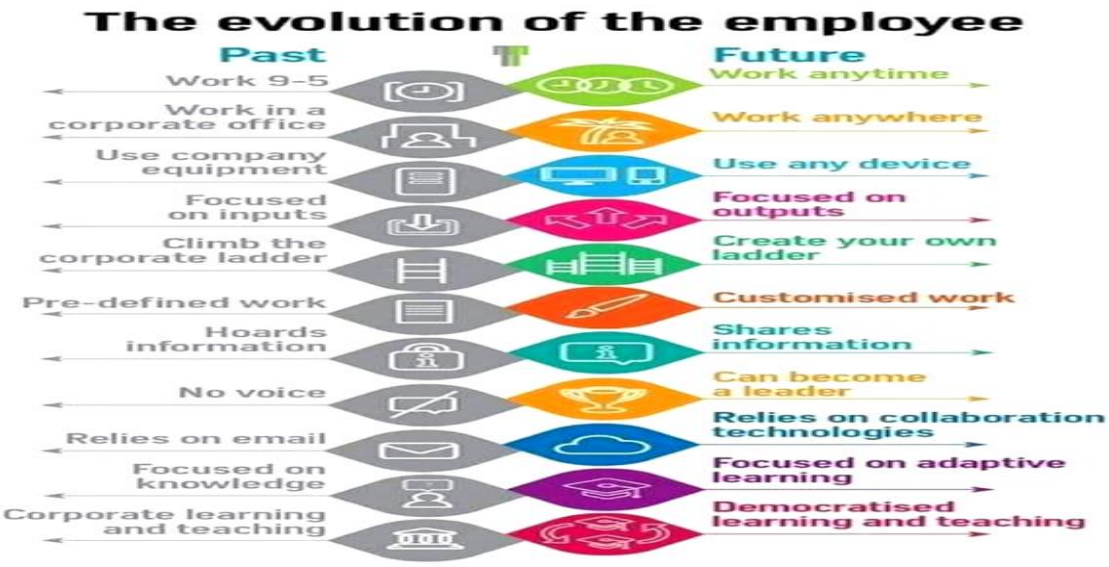
- Life after covid -19 will not be the same what we had till 2019. It will take its own course to return back to normal. Business concerns should equip themselves to withstand the demand of the government and customers to go ahead with normal business.
- They will be expected to be ready for the new/next normal. Business cannot be expected to return to normal post COVID-19.
- The famous phrase 'Business as usual' goes out the window. Business organisations will be called upon to reinvent with new objectives, marketing strategies, human resources management practices, financial injection and upgrading of technology, among others. New trends and new boundaries are likely to emerge. New ideas will be generated.
- Survival is dependent on both reaction and response. Businesses need to be wary of reaction as this may offer swifter perceived solutions but be detrimental in the long run. Responding may be more advantageous and tactical as it involves greater insight and thinking through the process.

Future of the Business – COVID 19

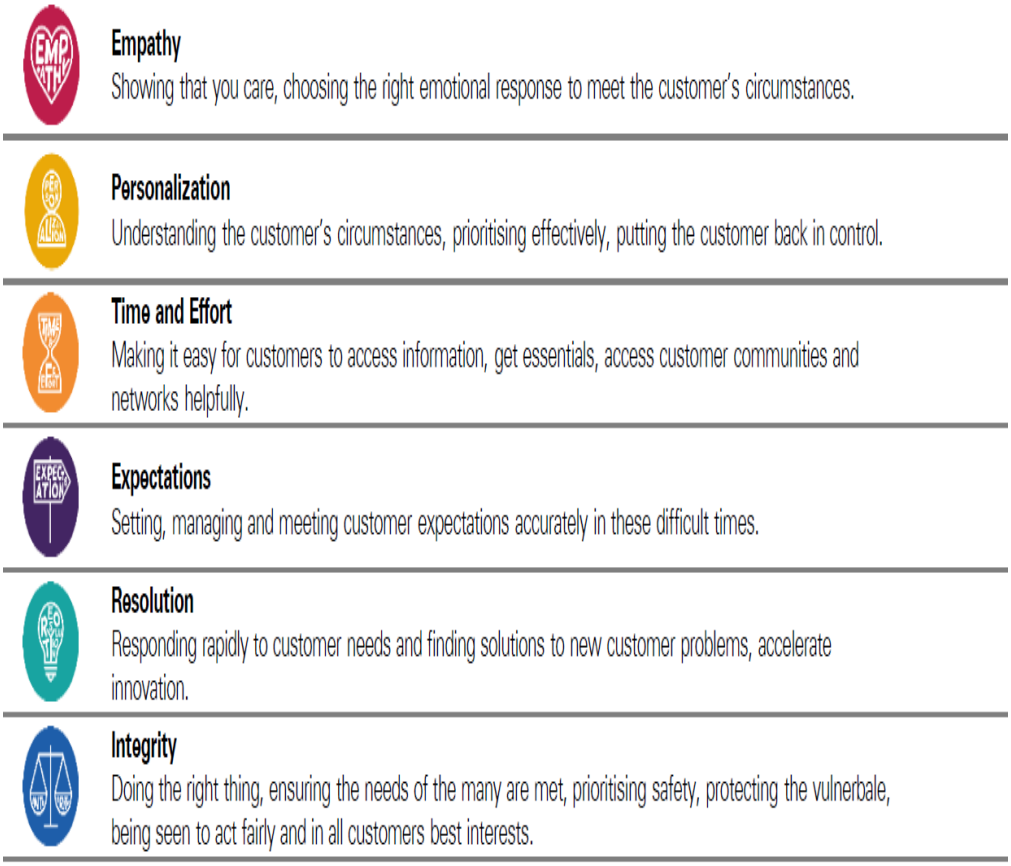
The job of Business managers / Executives has been transformed by the pandemic, according to the latest McKinsey Global Survey. Crisis management, social and environmental issues, and the accelerated adoption of technology are occupying time previously devoted to strategic leadership and finance capabilities. Between 2016 and 2021, the share of finance leaders who say that they are responsible for their companies' digital activities has more than tripled. Procurement, board engagement, and investor relations are also newly important focuses for CFOs.

- Innovation will play a pivotal role in the transformation of business organisations. Business organisations have to be more innovative than ever before.
- Resurgence will involve recovery of loss, rebuilding the brand, rebuilding trust of employees in the organisation, and preparing for unforeseen risks. Situation analyses need to be conducted, challenges need to be identified and addressed using a tactical or strategic approach.

Businesses will begin to pay greater attention on their customers. They will show greater care, display a greater understanding of their needs, provide more information, meet customer expectations, be responsive, be more protective and display greater integrity



Employee life style redefined

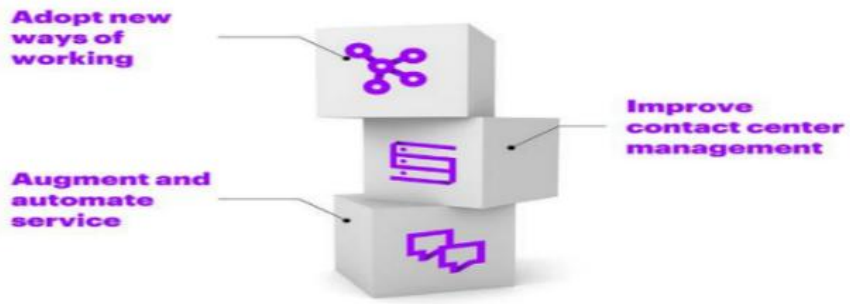


Adjusting To The Future

COVID-19 is pushing businesses to rapidly operate in new ways, and their resilience is being tested as never before. Businesses therefore need to rapidly adjust to the changing needs of their people, their customers and suppliers, while navigating the financial and operational challenges. Companies to continuously demonstrate that they have the health and interest of their clients and customers foremost. Anyone who feels that an organisation's environment poses a health risk, will avoid that organisation and have to lay a foundation for the future.

Conclusion

In summary, organisations need to relook and reshape their modus operandi and work together with other organisations within their environment because other businesses in the environment can also influence the behaviour of potential customers. One should never rule out the possibility that because people will prefer to stay away from overcrowded malls smaller businesses may be the choice of consumers because of the lower volume of human beings frequenting them but only time will tell.



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IMPACT OF ONLINE EDUCATION AND DIGITAL LEARNING IN COVID 19 -INDIA

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ABSTRACT

Online Education is taken a major role in the enhancement in the industries to optimizing the importance and presences in the field of Education as Major unavoidable parameters in most of the area from learning environment from KG to Ph.D. to attain the maximum height in the education sector

Indian Education system has taken a paradigm shift by giving a dominating role on the field of education by extending their full support towards online tutoring and digital platform a incredible position in the field of education

Online and Digital Education is become a key parameter of learning in the entire curriculum without having discrimination of student category in all levels and all sector educations School College Institute and, Universities

Online and Digital Platform has been further classified in to four segments or Key factor in its domain are listed below

1. Infrastructure
2. Content Development
3. Institution
4. End Users – Students

The above 4 components made the Online Education Successful and in details the importance and presences are elaborated in this article.

Infrastructure

To enable steam less follow of the process infrastructure is the back bone of ONLINE AND DIGITAL EDUCATION .Infrastructure clears determines the platform used for the tutoring that is listed as below with major components

Networking – Connectivity – Internet/Intranet /Bluetooth/others devices

Computer/Laptops/Mobile/Electronic Gadgets

Internet vendor

Service Provider – Application or Software service providers

We can broadly brief about the importance of infrastructure as a key factor of Online Education systems with well-established connectivity can only support the seamless flow of the process with high level of integrity of learning without any disturbances through wired or Wireless mode of communication to set as a basic requirements of communication channel in the digital segments

Computer/Laptop/Mobile/Electronic Gadgets as major end user component with their quality, performances will enhancing their benefits and support system with hardware configuration to speed the process to deliver the communication system in effective ways in direct visionaries control or audio control mode and replying with response to the tutor by 2 way communication for effective learning and transforming their thoughts into live tutoring

Internet Vendor plays a vital role in entire communication system that is key back bone on Online tutoring mode with wired or wireless as developing nation in the world India has routed to the internet communication across the country to reach the digital transmission that had supported on covid 19 situation in very efficient manner to cater the student's community

Service providers – Software companies which is promoting the online tutoring different segments of the student through various method of teaching techniques with the loads of features in the added in each every development of solution to delivery by tutoring , interaction with assessment and continued by certification in the field of excellences by recognizing the course or mode of education to the extended level with career developments to find out job opportunities for example non paid free service providers and paid services with the different levels of training packages

For example the common platform that is social media also attained as tool of the tutoring like facebookand You tube are also acted majorly in the covid 19 for the education institutes and also the leaner in all levels with free uploaded options and also with

online live lectures are also made to reach the large segment of audience in the different levels of education without any additional expenses to their regular activities with the convince in time especially with prerecorded uploaded lectures and it is any time any were mode of learning without any influences of the faculties and free online channels in markets to taps and influenced to read the new segments in their field or out of field to uplift themselves in the interested areas from Cookery to research scholar and the same Kinder garden student to the laboratory researcher

Infrastructure has been provided with completely safety and security of the data privacy of the individual and the group policy of the domain in teaching has been taken in account with architecture ,the infrastructure enabled to complete solution considering all parameters and data involved in each very step has been mined with protection of content, Data travel till the end users consumptions and feedbacks

Content Developers

Content Developers are real production unit people in other words who develop the product end to end to satisfy the need of customer at every point time

Here in Covid 19 situation lot of new content development team has been developed by variety to list they are as follow

Independent Teacher (Free lancers)

School, University, Institutes, College as team from their affiliated organization

Private Companies – Infra and Software solution providers developed a team on Content development.

E – Publishing

Industrial Experts of various field has developed the contents in their domains

Content developers has been major influencer in booming the online education mode in covid 19 through the method of adopting the different tricks and technic to attracts the students and influences their teaching method to attract the targeted audiences in large population in every levels of students

Online Model of teaching the video enabled teaching method has major impact when compare to audio bridge model because of the image interrupted face expression and making it live like Offline class room techniques has been influenced on major front especially in Prerecorded video tutoring

Live Online tutoring in covid 19 has improvised in more interaction comparatively with normal online tutoring and it is the only ways to get the doubts clarified to the faculties and teachers to cleared then there for better understanding and lot of interaction with unknown to unknown his happen here with subject experts on common public domain learning channels rather than organization or individual tutoring

The simple logical teaching method within time frame has been effective in few subject experts on school , research level in Maths , Physics , chemistry, computer sciences and other field too and the same in the levels many of the publishers has transformed to e – publishing mode as key factor of growth in the upcoming time due to the shift in the technology and also reachability to the students through online publishing

E– Publishing industries has proven themselves in Covid 19 to market themselves as key to the book reading population by promoting their products through websites and other public domain links , Free and paid websites with the library of various content in all languages and also subjects to caters the audiences and to fulfill their needs on their learning curves. E-learning is become is part in our life style at covid 19 and it is the only sources at certain levels to continue the learning without gap and therefore it will be continuing entire journey of life in future too

Covid 19 - Content team has prepared lot of new segments with the micro levels of the various vast field in to short term courses to make it crisp with need of the hour has been served in well efficient manner as expected by the readers and leaners

Institutions

Universities School Colleges and Corporate Training division has great opportunities to explore their Online learning domain to reach the target communities inside and out of the box in very short span time to expand their wing to the greater extent

In covid 19 situations made all levels of the students community from kidder garden to

research scholar the highest degree reader in the university Ph.D all was forced to use online learning to peruse the courses in different levels through their prescribed channels and all the domain they build their own infrastructure with content development to fulfill their pattern of teaching referring to their set target audiences in the class and also proven any were any time learning is made possible in India

Institution had some hard times initially to reach the segment students especially the school segment had very tuff time to undergone online teaching and proceed with the assessment when compare to the colleges , University and corporate training community because the school is gurukula method was been practiced across the nation in very predominant manner till date but this was broke by the Covid 19 situation in India to have change all around in teaching world of the Nation by enabling the Digital based leaning system

Institution has forced to take the technology development to adopt the online tutoring in the country and it was successful in urban cities without any second thought but reaching the rural segment it faced greater challenges with communication mode and infrastructure it was comparatively less support but considering the current situation the rural areas will soon become extra competitive in the education through this platform by access the their limits to sky

Institutions finally had a major influence of cost effectiveness and build a strong content base forecasting the future need in the library which will be brain storming always and also dependences on the teacher will also slowly get reduced by e-learning which is a negative sign in E- Learning and Online learning continuing to it the moral fear with teacher community is physical presences and classroom teaching can be reduced in the growth of Online teaching and it can be used as ready instant references but not as a regular one as to be concluded by the teachers

End Users

End users are the students which directly getting benefited by empowering the knowledge through continuous learning and learning never stops for the person in his life till his end so everyone is leaner in their life by enhancing themself through knowledge but since covid 19 Situation we look the student forces as major impact in online learning mode the students were leaned through entire new structure in technology enhancement

Regular Mode of learning is uplifted to Online and Digital mode of learning in last 3 months due to Covid 19 in India and it is been major factor learning stream in the school education with strong foundation of learning has been implemented in all class from primary to higher secondary schooling and the Govt of India supported to the core to establish the online learning curve to be in every corner of the country it is undefined growth within a short span of time for the end users and student were trained with new learning technology by indoor learning from their homes and complete safety measures were taken to monitor the students during tutoring session by the faculties and remote systems with the configuration features to have uninterrupted delivery and further it is developed to continue with assessment for evaluating their leaned skill sets of the students through online assessments and further enhanced with online evaluation for the teaching community to evaluate the assessment in secured system

Universities and Colleges has been next major segment of end users of online tutoring in the various field like Medicine Engineering arts and Sciences and also other aligned sectors have promoted their teaching through digital and online mode to cater their students for the continuity of education without any gap in the curriculum which defined by them and it was been effectively with the vast syllabus with the verification and interaction platforms that the featured in the online tutoring mode during Covid 19 many institutes to exchange their curriculum and their Content through various channel of communication through public and private domains to establish themselves to the best in the market and to promote themselves in the field they are and this made to students to adopt the new technology of reading without direct interaction, biased option was been disabled and very successful among the university and colleges a to exchange the ideas and it is a thought process to roll out through direct reach in short span of time

Corporate Training center and the Organization training is swing is used online mode training on day to day requirements for the skilled technical and management training are enabled for the workers in covid 19 situation and it is really proven to the employers to overcome the current situation in very effective manner to cater the different segments of people in the company and new employee learning modules has been put in place for the development of the worker to prove their efficiency in the work area and also to develop their skill set for the future requirement by forecasting the need of the organization and aligned with the digital mode of training by maximum their efforts to overcome with Covid 19 by lot of psychological counseling .Periodical training calendars has been prepared on timely manner to train the employees regularly and also lot short term courses has been enabled with the assessment based to evaluate with certifications Finally Covid 19 has major impact on the Online Education System in overall and enhanced it features to next levels and it will continue in the education sector as unavoidable position in the industry with load and loads of new technology and contents to perform the leaners to high levels.

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OPTIMIZING MAINTENANCE ACTIVITY OF AIRCRAFT USING LEAN TOOLS

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ABSTRACT

This study focuses on the application of lean techniques in aircraft maintenance with an emphasis on eliminating waste during maintenance operations at aircraft Maintenance and Repair Organizations (MROs). MROs (maintenance, repair, and overhaul) companies must be competitive and appealing to both existing and new clients. The important lean notion is to keep work in progress as short and cost-effective as feasible without sacrificing quality. During maintenance checks, the major goal is to continuously enhance processes and eliminate non-value-added operations. Prescribed processes must be properly followed in aeroplane maintenance, while time and cost savings are also important considerations. After examining lean methodology in the aviation maintenance process, it was discovered that optimizing maintenance operations is the most promising way for lowering maintenance time and costs. Maintenance time will be reduced, and errors that cause production downtime will be reduced, if the maintenance function is optimized. The lean manufacturing method reduces all types of waste, as well as waste in the maintenance process [1]. Plants can improve with far less risk if flaws that cause effort and impede production efficiency are eliminated. The likelihood of component failure is computed using past aircraft maintenance records, as well as the aircraft type, operational condition, number of hours flown, number of cycles completed, and engine types installed in the aircraft. This data is used to prioritize the maintenance activities in servicing of aircraft. This article's goal is to showcase some of the lean tools and tactics that may be utilized to improve the maintenance process. This study was based on issues that occurred on eight aircraft over the course of four years in one of the private aviation businesses. The impact of the pattern of these problems was thoroughly studied once data on system-wide flaws was acquired.

Keywords: *Preventive Maintenance, Total Productive Maintenance (TPM), Kanban, Predictive Maintenance,*

1. Introduction

In order to meet increased client demand, it has become increasingly vital for most manufacturing industries to improve the industrialized environment and the corresponding industrial development. The most well-known strategy for increasing productivity is lean manufacturing, sometimes known as lean production. Lean manufacturing is a multi-faceted strategy that combines a number of management practices, such as just-in-time (JIT), quality systems, supplier management, and others, into a modernized, outstanding quality system that produces finished products at the speed of demand with little or no waste. [10]. Lean principles were once restricted to the automotive sector. Lean ideas, which were once limited to the automobile industry, are now attractive standard successful practice in a wide range of businesses [4]. The most effective tools for collective lean manufacturing are [1]: 1) cellular manufacturing, which divides processes into cells and includes all necessary assets; 2) Just-In-Time (JIT), in which a client initiates demand and transmits it backward, "pulling" production; 3) Kanbans, a signaling mechanism for JIT production implementation; 4) Total Preventive Maintenance (TPM), in which staff perform routine maintenance on equipment to avoid malfunctions; and 5) machine setup timing. 6) 5S, which focuses on standardized work routines and effective workplace organization; 7). Total Quality Management (TQM), a customer-centric continuous improvement technique that combines participative management. Lean manufacturing tools are designed to save costs by eliminating waste. The seven waste sources identified by lean manufacturing are overproduction, waiting time, transportation, over processing, inventory, motion, and scrap. [6].

Using lean technologies, this research focuses on optimizing maintenance activities in aeroplane maintenance.

2. Optimization of Maintenance

Maintenance work in addition to continuing upgrading activities has a key and precise role in Total Productive Maintenance (TPM) optimization. By analyzing the outcome of predictionmaintenance, condition monitoring and preventive maintenance, lean maintenance eradicates redundant maintenance activities.

Maintenance engineer has to study the following activities in order to create optimization in maintenance.

1. Investigation of unscheduled and emergency report
2. Practice of Computerized Management Maintenance System (CMMS)
3. Examining reports on planned/preventive maintenance
4. Analyze data from condition monitoring and predictive maintenance. Resolve high cost areas
5. Investigation of all the maintenance records to mark approvals for

i. Alterations to Preventive Maintenance (PM), Condition Monitoring(CM)
ii. Predictive Maintenance (PdM) regularities
iii. Modifications to counteractive maintenance norms
iv. Alterations to overhaul conditions/frequency
v. Improve test and inspection procedures, as well as introduce cutting-edge testing and inspection technology.
vi. Implementation of the Condition Monitoring and Predictive Maintenance program's direction and cost control.
vii. Examine the CM/PdM program's equipment on a regular basis and remove any equipment that no longer requires CM/PdM.
viii. As needed, exclude or add to the CM/PdM program's equipment and other components

3. Optimal Maintenance Frequencies

The duration of time equipment should be functional between major services is a common source of concern in developing and enhancing Total Productive Maintenance plans (overhauls). The usual law predicts a higher number of single-equipment breakdowns.

We collected data of single item of Turbo-cooler of air conditioning system run hour between major servicing used in eight aircrafts. Run hour between major servicing is as demonstrated in table.1

Table.1 Individual Equipment Failure

Turbo-cooler Serial number	Between Overhaul Run Hour
5	896.15
4	788
8	865
2	621
1	844.45
7	978
6	796
3	759.20
Average	818.475

If the consideration is the time period between the overhaul is chosen, where 50% of the Turbo-cooler fail at 818 hours. The average duration for a turbo-cooler to fail is 818 hours, which means that 50% of turbo-coolers break after 818 hours of service. After 782 hours of flying, each turbo-cooler would be taken out of service for overhaul if the goal is to prevent 60% of failures

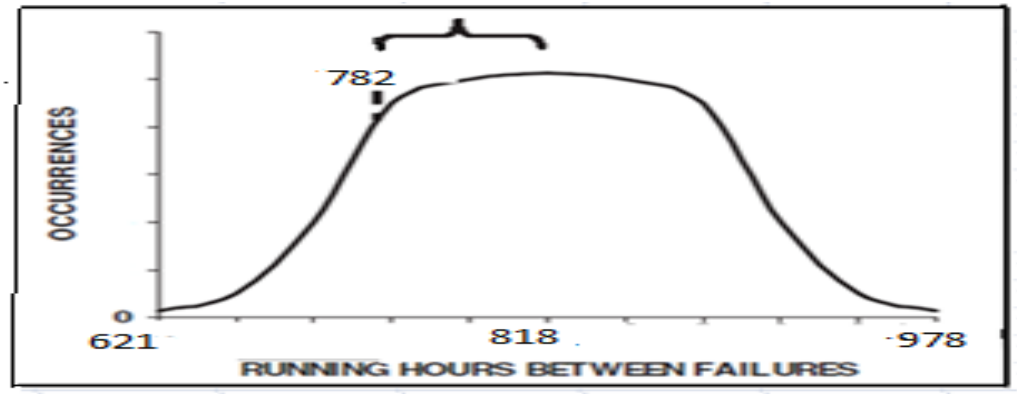

Fig. 1 Determination of total frequency based on time period

4. System Overhaul Frequency

System-level servicing is part of the maintenance process (overhaul).The failure frequency of the component utilized in the system should be known by the maintenance engineer in order to calculate the system's overhaul frequency.

Table No. 2 Overhaul Frequency Determinations

Serial Number.	Components	Breakdown per 1000 hrs.
1.	Coupling	0.28
2.	NRV	0.13
3.	Pressure Reducer	0.7
4.	Pressure Regulator	0.65
5.	Vent valve	0.9
6.	Vacuum Valve	0.45
7.	Two way flow valve	0.28
8.	Fuel content gauge	0.43
9.	Fuel flow indicator	0.87
10.	Fueling valve	1.52
11.	Pressure Indicator	0.87
12.	Booster pump	0.33
13.	Engine Pump	0.87
14.	Differential pressure gauge	1.06
15.	Total failure per 1000 hours	9.34

As a result, the expected time between failures (ETBF) for the entire system is:

$$\text{ETBF} = \frac{\text{Addition of time}}{\text{Total Failures over the course of time}} = \frac{1000 \text{ hours of work}}{\text{There were 9.34 failures}}$$

Between failures, the average time is 107 hours.

The inclusion of preventative maintenance procedures has no bearing on the occurrence of defects or the item's criticality. The predominance of any sort of condition-based maintenance is based on the fact that most failures do not occur immediately, and it is often possible to detect a failure in the later stages of degradation.

The complete process is depicted as a P-F curve in Figure 2. The graph depicts how a problem starts and progresses to the point where it can be noticed (the potential failure point P). It will continue to deteriorate—usually at a faster rate—until it reaches the point of functional failure if it is not diagnosed and suitable steps are not taken.

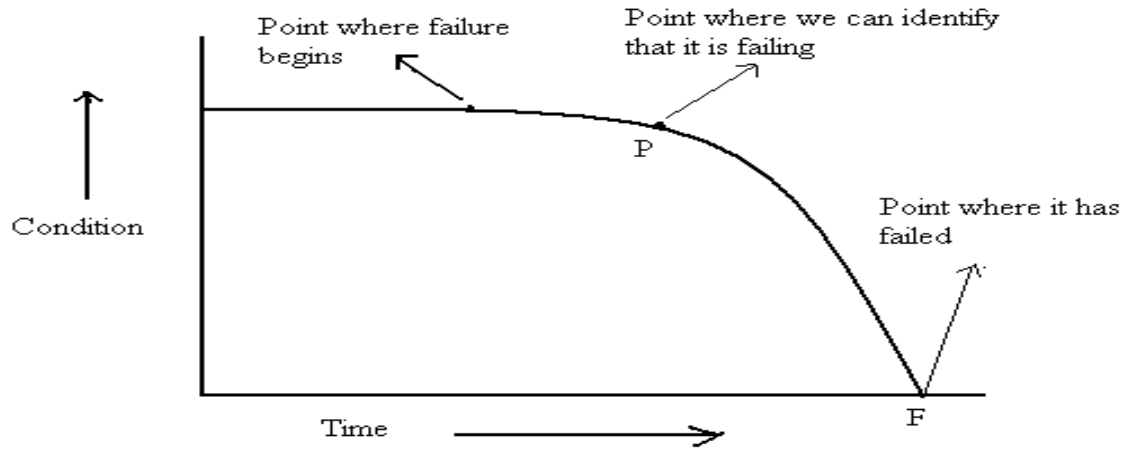

Fig.2 Cure for Potential Failure

As demonstrated in Figure, the P-F interval is the time (or number of stress cycles) that passes between the commencement of a potential failure and the onset of a functional failure. The P-F interval determines how frequently the prediction work should be conducted. The checkup period must be substantially shorter than the P-F interval if a potential failure is to be discovered before it becomes a functioning failure.

The P-F interval is calculated based on the component's stress exposure, such as operating hours, output, start and stop cycles, and so on, however it is commonly represented in time. The amount of time required to react to any potential failures is also a factor in condition-based task intervals. Typical reactions include one or more of the following:

- Take the necessary precautions to avoid the failure's ramifications.
- Corrective measures can be scheduled without disrupting maintenance or production
- Identify the resources needed to fix the problems.

5. Discussion

This research has calculated the flaws that have occurred on aircrafts in a rigorous manner. Specifically, I have investigated faults in critical aircraft systems such as the air-conditioning and fuel systems. This outcome has far-reaching ramifications for the company. To the degree that a company wants to avoid certain sorts of mistakes, it must take into account the changing nature of the situation and working settings. Costs are usually associated with aircraft defects. As a result of the higher expenses of a specific type of fault, organizations should carefully examine the nature of surroundings and operating scenarios. Another advantage of the current study is that it stresses the significance of Lean Tools and Lean Maintenance methodology. In aeroplane maintenance, a strategy for combining findings and drawing conclusions is described... As a result, the lean organization is fully prepared to implement its plan, has an operational version of the situation, and maintains a strong presentation

6. Conclusion

Shorter lead times, reduced inventories, fewer defects, and lower operational costs, as well as improved customer and employee satisfaction, have all been accomplished by implementing lean principles. Organizations that apply lean principles to their maintenance operations have the ability to:

i. Improve their maintenance service by focusing on the needs of the service rather than the company's best interests.

ii. Reduce operating costs by lowering inventory and eliminating the need for rework.

iii. Implement flexible procedures to increase the amount of flexibility available to deliver varied services.

Aviation maintenance is continuing to make significant strides in the direction of leanness, and this study has specified some hands-on approaches in which lean ideas might be applied to aircraft maintenance. It has been proved in the industrial business that embracing lean ideas can result in significant cost savings. Furthermore, a lean mentality may prove to be a prerequisite for survival in a future market characterised by rapid technological advancement and rising customer expectations. Maintenance is becoming increasingly important in today's world. Facility and plant managers are aware of the impact that equipment reliability and maintenance have on operating costs, production, and revenue. Aviation maintenance is continuing to make great progress toward leanness, and this study has identified several practical ways to apply lean concepts to aircraft maintenance. In the industrial world, it has been proven that adopting lean principles can result in significant cost reductions. Furthermore, in a future market marked by rapid technology innovation and increased customer demands, a lean culture may prove to be a requirement for survival. In today's world, maintenance is getting more critical.

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POST COVID ERA - BANKING SUPPORT TO LOAN CUSTOMERS AND ITS ACCEPTANCE

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ABSTRACT

The COVID-19 pandemic is the most serious challenges faced by both Customers and the financial industry as a whole in last 100 years. The COVID-19 impact on banking has witnessed severe stress in banking business due to fall in demand, loss of jobs, production shutdowns which resulted in poor repayment of loan. It has also seen a worst operation condition with shortage of staffs, inadequate digital maturity, and pressure on the existing infrastructure to deal with COVID-19. Banking Customers faced huge challenge to perform normal banking transactions, restriction in movement etc. The borrowers were unable to pay their EMIs on time due to business shutdown and lack of buyers with almost nil demand. Customer are expecting further financial relief to face the pandemic. On one hand most of veteran businesses have come to stand still whereas this pandemic had opened up great opportunities for E-Business, E-Management and E- Education and proved its possible at different heights.

Keywords: *Regulatory Package, RBI, Loan customers, Covid Pandemic, EMI payment*

Introduction

Globally, the corona virus outbreak now has hit millions of lives with thousands of deaths across the world. The ongoing spread of COVID-19 has become one of the biggest threats to the global economy and financial markets. India like many other countries had to go for nationwide lockdown, restriction movement of entire population, shutting down public places and transport, insisting public to stay indoors and maintain social distancing which resulted in huge economic disruption. The adverse effects of the COVID-19 pandemic are trickling down to major sectors of the Indian economy, with manufacturing, auto, retail, aviation and hospitality bearing the brunt of the lockdown. This in turn has affected fast growing industries which are closely linked to the aforementioned sectors. Shut shops, travel bans and reduced discretionary spends by consumers. Due the impact, Corporates had to change their priorities, and allowed their employees to work from home. Due to the change in working environment online business has seen a huge demand.

In this paper we have attempted to dwell deeper into post COVID era, Banking support to loan customers and its acceptance with the customers. Banks had provided multiple regulatory packages to back up its customers during pandemic. Our intention to identify if the customers were backed up and sufficiently covered during the pandemic.

RBI announced certain regulatory packages to overcome from the COVID-19 Pandemic by providing relaxation in repayment of debt and improving access to working capital to prevent financial stress to business holders.

Factors of Regulatory package offered by RBI

(a) Rescheduling of Payments: Term Loans and Working Capital Facilities

1. **Moratorium I** – March to May 2021 provided to all loan holders where EMI was deferred but interest accrued.
2. **Moratorium II** – June to Aug 2021 provided to select customers and select banking products, EMI deferred but interest accrued

(b) Provisions in Working Capital Financing – Restructuring: Restructuring of existing loan in either in the form of reducing the EMI amount by increasing the tenure or providing an additional facility in the existing loan.

(c) Asset Classification: Reserve Bank of India decides to convert accumulated Interest into Funded Interest Term Loan and change the credit policy of the borrower to particularly overcoming from COVID-19 Crises. Also, stressed asset was not downgraded from standard even if past due to Covid 19 pandemic.

(d) Ex-gratia: Reserve Bank of India has provided Ex-Gratia to the customers. Interest charged on interest has been reversed to the customers. Few financial banks adjusted this

amount with the principle and rest reversed to the saving account of the loan customers

Review Of Literature

Information technology: According to the industry professionals, competitors in India's IT services had faced considerable slowdown in growth throughout the financial year because of the COVID-19 outbreak. Leading software exporters such as such as TATA Consultancy Services (TCS), Hindustan Computers Limited (HCL) and Infosys had reduced technology investment from shareholders during the global lockdown. Owing to the fear of the uncertain economic situation and financial crises, Other industries has cut their IT expenditures and delay the new developments. Owing to constraints in air travel and closure of cities and states to control the transmission of the COVID-19, India companies have faced many client cancelations of projects across the field (Kumar, 2020).

Manufacturing industry: COVID-19 has incurred substantial impact on Indian enterprises, and that employment is at significant risk. Companies have decrease the workforce. And witnessed sudden drop in all financial activities. The present situation shows a significant level of impact on their business, as nearly 72% of the participants (Goyal, 2020). In addition, 70% of the analyzed companies are expecting a declining sale in the financial year. because of the current epidemic of Coronavirus, import demand has a direct influence on the Indian sector. Industries like organic chemicals, plastics, fish products, cotton and ores, Industrial manufacturing services, logistics, chemicals, shipping, pharmacy, automobile, smartphone, appliances, fabrics and airlines have also been severely impacted (Goyal, 2020).

Education: Education was impacted in response to COVID-19 because of school shutdowns (UNESCO, 2020a). Closure of schools not only influences learners, teachers and families but also affects the social and economic status of many. The shutdown of schools in response to COVID-19 have highlighted numerous global issues such as digital learning, food insecurity, childcare, internet, health care and disability services. Distance learning. Owing to lack of resources or reliable internet access can protect students from rural and underprivileged families. Lack of technology or sufficient network connectivity is a challenge to constant learning, especially for learners from underprivileged families (UNESCO, 2020b). UNESCO suggested using distance education programs and online learning and resources that schools and teachers can use to monitor and control learners to minimize disruption of education in response to closure caused by the COVID-19 (UNESCO, 2020c). Hundreds of libraries have temporarily closed to help alleviate the spread of COVID-19.

Tourism: India is focused on historical and cultural hospitality, drawing domestic and foreign nationals around the year. Due to Covid 19 visas were suspended foreign tourists. Tourist destinations were shut down for indefinite period. This affected entire tourism value chain that covers hotels, restaurants, agents, attractions and operators that generated losses of thousands of crores. Tourism industry and may end up damaging the industry for the coming years (Muthukrishnan, 2020).

Research Objective

1. To identify, if factors of regulatory package offered by Reserve Bank of India to the Bank Loan customers through Banks were sufficient to protect them self from financial crisis during the period of Covid 19 pandemic
2. To find out the influence of demographic variables on loan customers

Research hypothesis

1. There is a significant difference of opinion with the loan customers from different industries who claim that they are not happy with the regulatory package provided to the loan customers through banks against Covid 19 pandemic
2. There is significance difference of opinion on support offered basis of gender.
3. There is influence of nature of business with regards to supports offered through banks

Research Methodology

The study is descriptive in nature. To study, if support provided by RBI to Banking loan customers to support during Covid 19 pandemic were sufficient across all Industries. We have picked up 4 industries and conducted the survey. The Survey was conducted using questionnaire as a research tool. Data was collected using non-probability convenient sampling method. The research tool is a standardized questionnaire with statements containing measurement items adapted from Alain Y-Loong C, et.al (2010).

Tool Description: The questionnaire consists of two sections. The first section measures the demographic profile of the respondents assessing their age, gender, occupation and nature of bank and Loan type. The second section had 22 statements related to four industries namely Information technology (6 items), Education (6 items), Manufacturing industry (5 items) and Tourism (5 items). The items are measured using five-point Likert scale, ranging from 5 – strongly disagree to 1 – strongly agree to indicate a degree of agreement or disagreement with each of a series of statements related to the stimulus objects. The collected data was analyzed by examining the distribution of responses based on frequencies and percentages. Inferential statistical tests ANOVA and t test was used to test the stated hypotheses.

Reliability Analysis: Reliability in statistics is the overall consistency of a measure. Cronbach's alpha is the most common measure of internal consistency ("reliability"). It is most commonly used when we have multiple Likert questions in a survey/questionnaire that form a scale and wish to determine if the scale is reliable. All the statements of the questionnaire showed Cronbach's alpha value ranging from 0.609 to 0.774 and hence indicate that the scale is reliable.

Analysis And Discussion

Descriptive Analysis: The demographic profile of the respondents, it is evident the **Male** respondents are found to be dominant in numbers with 84%. Respondents with **Age group** of 26 to 35 years and 36 to 45 years are found to be higher with 34% and 32 % respectively while above 56 years are lesser with 6%.

Industry: Higher percentage of 62% respondents are found to be from Manufacturing industry related, 14 % from Hotel related industry, 10% from IT related industry and lesser percentage fall in to other categories. As far as the **type of Bank** where the respondents have account, the Private banks are found to be greater with 86% while remaining 10% and 4% are found to be Public banks and MNCs respectively. Also 94% of respondents are having Loan accounts and 6% are having Current account in banks.

Inferential Analysis:ANOVA

The research hypothesis (H1) of opinion difference on the regulatory package offered by RBI based on age was tested using ANOVA. The result of ANOVA shows that all the Regulatory package except Ex-gratia is significant at 5% level of significance. The respondents significantly differ in their opinion on Moratorium based on their age. The respondents with age group of 18-25 years and above 56 years are found to have lesser benefit when compared with other age groups.

Respondents with 26-35 years and 18 to 25 years' age group feel Loan restructuring is beneficial while respondents with higher age group comparatively have lesser degree of feeling on Loan restructuring. But the entire set of respondents feel there is average on Loan restructuring (mean 3.00). Also people with age group of above 56 years agree that there is difficulty availing these regulatory while people of 46-55 years do not agree much with the difficulty feeling as compared with other age groups.

Influence of Nature of Bank on Factors of Regulatory package

In order to test the hypothesis (H2) ANOVA test was applied and the results show that the nature of bank has a significant influence on the factors of regulatory package, namely Moratorium, Loan Restructuring Asset non classification, Ex-gratia. The result of ANOVA shows that all the factors of package except Loan restructuring is significant at 5% level of significance. The respondents significantly differ in their opinion on Loan restructuring based on their Bank

The respondents banking with the Public sector banks and MNC banks are found to have lesser benefit when compared to the respondents banking with Private sector banks. Respondents banking with the Public sector and MNC banks feel that Loan restructuring is better managed there as compared to the respondents banking with Private sector banks who have lesser degree of feeling on Loan restructuring.

Respondents whose primary bank is MNC, agrees that there is difficulty in getting the regulatory whereas the respondents using Private banks has lesser difficulty. Public sector bank customers feel an average difficulty in availing the relief

Customers banking with public sector banks feel that Ex-gratia was not well managed while the MNC banking customers feel that it was managed well. Private sector bank customer feels that the Ex-gratia offering is average

The result of ANOVA also shows that all the factors except Asset non classification and Ex-gratia is significant at 1% level of significance. The respondents significantly accept in their opinion on Asset non classification and Ex-gratia based on their prime bank.

T test: Opinion on Factors of Regulatory package based on Gender

Respondent's opinion on the factors of regulatory package offered by RBI to loan customers basis of gender (H3) was tested using t test. The results revealed that there is significant influence of gender on the factors Moratorium and Ex-gratia. Compared to male, female respondents are found to be unhappy about the relief provided to loan customers of the bank. The factors Loan restructuring and Asset non classification does not show a significant difference among male and female respondents.

Findings

The key factors of Regulatory package offered by RBI covers the loan customers or incomplete

a. Moratorium I was offered to all customers during March 2020 to June 2020. EMI was deferred but interest was added and tenure of loan was extended.

   Moratorium II was offered at the discretion of the financial institutions. Most of the customer who was in needed of payment deferment due to suffering of Covid 19 Pandemic was denied.

b. Loan Restructuring was not offered to all the customers who suffered financial crises. It was offered to only few customers with many eligibility clauses.

c. Asset non classification, any loan customer who had delayed to pay the EMI, NPA classification was postponed. This option was offered only to Loan against property. Further there were too much delay and removing NPA from the loan accounts which were tagged during that period. This option was not provided for unsecured loans. Deferred payments were listed in CIBIL.

d. Ex-Gratia was offered based on RBI circular. But the amount was very small and there was no impact on the size of the loan.

e. There is influence of age on regulatory of package offered to loan customers particularly in Moratorium, Loan restructuring and Asset non classification. Higher age group of people feels regulatory package was not complete for loan customers.

Conclusion

During Covid 19 pandemic, Business were completely shut down and income source have come to halt. The scope of repaying EMI was real challenge. Banks were facing the problem of NPA, Non recovery of loan, Bad loans etc. Therefore, Reserve Bank of India announce COVID-19 Regulatory Package for all commercial banks (including Small Finance Bank, Local Area Bank, Regional Rural Bank), All Primary (Urban) Cooperative Banks / State Co-operative Banks/ District Central Cooperative Banks All All-India Financial Institutions, All Non-Banking Financial Companies (including Housing Finance Companies). However, these regulatory packages did not fully cover the Loan customers' requirement cycle.

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PERCEPTION OF LUXURY VALUE ON PURCHASE INTENTION TOWARDS LUXURY BRANDS

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ABSTRACT

The products of luxurious nature are bought and festooned by the people to exhibit their prosperity, wealth, social status or the success. They also purchase those products for just s satisfaction of buying a product of superior quality. The people derive the subjective worth of the luxury products on the basis of their perceptions of the value. The present study has been done to examine the effect of luxury value on the purchase intention of the customers to buy the luxury products. The study is done among the individuals who buy luxury products in Chennai. The sample population is selected through convenience sampling and the sample size is 100. The data was collected with the help of a questionnaire and analysis of the data is done using regression. The outcomes of the study show that purchase intention significantly influence by luxury value perceptions.

Keywords: *luxury value, purchase intention*

Introduction

The term luxury has been a concept of discussion for several years. There is no one author yet who had given clear explanation regarding the concept of luxury. Goody (2006, p. 341) has defined it as the superior enjoyment of eleganceof the things required but not crucial. When the products are defined, Shukla and Chattalas (2015) had defined the products of luxury as the ones which lead to comfort and pleasure and it is also tough to obtain. In the words of Nueno& Quelch (1998), a few features of luxury brands comprise of 6 elements which are high price, premium quality, uniqueness, scarcity, aesthetics, personal history, ancestral heritage etc.

The term purchase intention refers to the readiness for purchasing a product. According to Sangyoung and Sungyoung (1999), the term purchase intention is referred to as the linking point of purchase behavior and the attitude. When the attitude and purchase behaviors are considered, purchase behavior is more predicted by the purchase intention (Koh, 2013). In the attitude model for purchasing towards the buying act, purchase intention is the final step and not the attitude regarding the product (Solomon, 2011). For exploring the purchase intention of the customers, it becomes significant to consider their attitude towards the term luxury.

The value of a product refers to the one among the inherent values of the purchase decisions of the consumers. In this context, Zeithaml in 1988 had stated the definition for the term value to be the total evaluation regarding the subjective worth of the goods or service by taking into consideration all the relevant criteria of evaluation. Studies regarding the value of luxury products explain that there are three main dimensions of value which include social, functional and personal perception of values (Wiedmann et al., 2007).

Few consumers buy the luxury brands mainly for the product's functional value. These values comprise of values of usability, uniqueness and quality (Hennigs et al. 2012). One among the primary functional values of the products is the high quality of the product. In fact, no luxury products come with low quality. Though the value of usability is functional, it is not so prominent like the uniqueness and quality values. The main element of a product which captures the focus of most of the customers is the product quality which makes the customers to purchase it. Quality is quite often related with high cost. Hence, cost and quality are related with each other and this relationship is clear regarding the luxury products (Stamper et al., 1986).

Objectives of the study

Objectives

The objective of the study is to check whether the luxury value as perceived by the consumers affect their purchase intention.

A Literature Review

AyselErcis and Bilal Celik (2018)had examined the impact of perceptions regarding value on the purchase intention towards luxury products. The study was done with the help of moderation played by consumer knowledge. The objective of the presented paper was to explore the way in which the perceptions of value influences the purchase intentions of the consumers towards the luxury products and also the way in which the consumer knowledge moderates the relation amid consumer's value perceptions and their luxury purchase intentions. The sample size of the study was 271 consumers of Bursa. The analysis of the data was done through SEM. A survey was carried out to collect the data from the respondents. The findings of the study showed that the functional, personal and social values impact the purchase intention of consumers towards the luxury products. consumer knowledge was also found to moderate the relation of functional and personal values with purchase intention. But this consumer knowledge did not have any moderating effect on the relation of social value with purchase intention.

Michael Chattalas and Paurav Shukla (2015) had reviewed the effect of value perceptions on the purchase intention of consumers towards luxury products. The study was a comparative research done in a developed market. The products or services are given their subjective worth by the consumers on the basis of their perceptions of value about the product. The authors of this study had evaluated the effect of the perceptions of value on the purchase intention by focussing on 2 biggest luxury markets (UK and USA). The collection of the data was done using survey based and cross-sectional methodology and analysis was done using SEM. The outcomes of the research showed that, in both the nations, functional value of the product influenced the purchase intention. But the social value was seen to have an influence over the purchase intention only in USA. The perceptions of personal value affected the purchase intention among the consumers of UK.

Mohd Noor Mamat et al., (2015) had studied about the purchase intentions regarding theforeign luxury brand handbags among the consumers in the city of Kuala Lumpur, Malaysia. The products of luxurious nature are purchased and utilized to exhibit their richness in the society or just to make use of the product which is of superior quality and get satisfaction from it. The reasons as said above in the purchase of luxury products are affected by the culture. The authors of this study had found out the motivational factors which influenced the consumers to buy handbags of luxury brand Kuala Lumpur. The authors had considered the income of the consumers to be one of the factors which affects the purchase intention. They had also considered the functional, experiential, vanity achievement, symbolic, social influence dimensions. Data was collected through questionnaires which were self-administered. The respondents of the study were the purchasers of shopping malls in Kuala Lumpur. The sample size was 382 and the respondents were selected through convenience sampling method. simple frequencies, correlation, hierarchical regression and factor analysis were calculated for the data so collected, for the analytical purpose. Findings showed that income, functional value and vanity achievement had a direct influence on the purchase intention of the Malaysian consumers for luxury goods.

Research Methodology

The study is done among the individuals who buy luxury products in Chennai. The sample population is selected through convenience sampling and the sample size is 100. The data was collected with the help of a questionnaire and analysis of the data is done using regression. Luxury value scale adopted from Michael Chattalas and Paurav Shukla (2015) and Purchase intention scale adopted from Shukla &Purani. (2012).

Analysis And Interpretation

Influence of social value perceptions on purchase intention

R	R Square	Adjusted R Square	F	Sig.
.893(a)	.798	.785	61.236	0.000(a)

Coefficients(a)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.142	.164		6.982	.000
I opt for luxury apparels and accessories for impressing other persons.	.031	.028	.057	1.097	.275
Possession of luxury accessories shows a sign of prestige.	.135	.036	.254	3.751	.000
Purchase of luxury accessories has got a status value.	.100	.040	.167	2.514	.014
If a luxury accessory has got a status value, I will pay more for its purchase.	.061	.038	.102	1.607	.111
For me, the luxury accessory's status is relevant.	.262	.037	.426	7.010	.000
I feel that luxury accessories are important as their usage makes me accepted in my work surroundings.	.092	.033	.209	2.792	.006

a Dependent Variable: Purchase Intention

The above table revealed a positive coefficient, which means that among all the statements, two statements not impact on the purchase intention of luxury product purchasers in Chennai. There was a positive relation found between social value and purchase intention. R value of this study was 0.798 and significant value of the study was 0.00. Findings show that the luxury products' purchasers were highly influenced by the social value.

Influence of personal value perceptions on purchase intention

R	R Square	Adjusted R Square	F	Sig.
.932(a)	.868	.858	86.670	0.000(a)

Coefficients(a)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.908	.128		7.093	.000
The possession of luxury accessories makes me more happy.	.140	.030	.303	4.717	.000
In certain times, I am bothered that I am not able to purchase all the goods which I need.	.015	.031	.032	.488	.627
The purchase of luxury accessories makes me to forget the problems in life.	.119	.024	.266	4.989	.000
I become a fashion leader than a fashion follower when I use luxury accessories.	.097	.022	.203	4.428	.000
When I buy the luxury accessories, I get the excitement of hunt.	.111	.027	.230	4.187	.000
The purchase of luxury accessories helps me to improve my mood.	-.069	.028	-.127	-2.486	.015
Purchase of luxury apparels is the reflection of my self-image.	.322	.035	.480	9.096	.000

a Dependent Variable: Purchase Intention

The above table revealed a positive coefficient, which means that among all the statements, one statement not influence on the purchase intention of luxury product purchasers in Chennai. There was a positive relation found between personal value and purchase intention. R value of this study was 0.868 and significant value of the study was 0.00. Findings show that the luxury products' purchasers were highly influenced by the personal value.

Influence of functional value perceptions on purchase intention

R	R Square	Adjusted R Square	F	Sig.
.879(a)	.773	.761	64.120	0.000(a)

Coefficients(a)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.107	.154		7.183	.000
I get attracted towards the luxury accessories which are unique.	.085	.031	.168	2.740	.007
The purchase of unique luxury accessories makes me to feel lucky.	.284	.047	.419	5.979	.000
I do not prefer the luxury accessory which is possessed by others.	.163	.032	.253	5.018	.000
I give more importance for the quality of the luxury accessories.	.129	.037	.286	3.474	.001
The main reason for my purchase of the luxury accessories is its superior quality.	.032	.035	.079	.916	.362

a Dependent Variable: Purchase Intention

The above table revealed a positive coefficient, which means that among all the statements, one statement not influence on the purchase intention of luxury product purchasers in Chennai. There was a positive relation found between functional value and purchase intention. R value of this study was 0.773 and significant value of the study was 0.00. Findings show that the luxury products' purchasers were highly influenced by the functional value

Conclusion

To conclude, the perceptions of value of a product by the consumers plays a massive role to impact the purchase intention of the customers towards the luxury products. the knowledge of the consumers also plays a role to push the purchase intention of the consumers. It becomes crucial for the marketers to consider the value and perceptions of value so as to apprehend the perceptions of the consumers about the value of the product of luxurious nature. The future studies can be done to explore the moderating effect of the expertise on the purchase intention of the luxury products. research can also be done on the value perceptions by taking any one sector into consideration. When considering luxury value constructs, personal value perception highly influence on purchase intention. Overall, Purchase intention significantly influence by luxury value perceptions

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WOMEN SAFETY USING UNMANNED ALL TERRAIN VEHICLE USING IOT AND CLOUD COMPUTING

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ABSTRACT

The nation has become a very dangerous place for commuters, especially women. Recent acid attacks, brutal rape, murder and physical abuse of women have made a clear statement that even the laws are also not able to put people under check. Despite several laws being made for the safety of women, these laws are not abided and fail to fulfill the purpose. In a country with such cultural heritage it is very unpleasant to witness crimes committed towards women. A major problem regarding to women safety has been the lack of immediate support or resistance, this can be overcome with the recent development in technology these type of technology can be used to prevent and protect any such offenses from occurring, One such technology is implementation of UATV which can be prevent offense from being committed at the first place. UATV are ergonomic which makes the patrolling using such technology easy, reliable and efficient.

Keywords: *Women Safety, UATV, Patrolling*

Introduction

Mechatronics is an interdisciplinary branch of engineering, comprising of Robotics and Mechanical fields. With the development of technologies at a rapid pace new technologies emerge on a daily basis. The rapid modernization in the fields of Artificial Intelligence and Internet of things gave rise to the field of Autonomous Thinking or in other words ability of a machine to think on its own unlike artificial intelligence, autonomous intelligence depends on the surroundings and the measurements made by the sensors of the device to make and perform real time calculations.

Combination of all these technologies leads to development of drone technology, the technology used in this project. Drones can be used in various fields across domains. Present drones are used for various purposes, using drones for women safety patrolling by integrating all these elements development of an UATV takes place which can be used to perform patrolling operations for women safety. Technologies such as IoT and cloud computing are used to support the architecture and complete the integration of the autonomous system for women safety.

Objective

- To Address the issues on women safety and provide a solution to deal and effectively manage the crisis
- To reduce alarming concerns with regard to women safety, Eradicate the women safety issues completely from the society by use of modern technology.

The Uatv

UATV are easily operable and can be used to carry out surveillance with relative ease, when on patrol duty if the drone encounters women facing crisis and the same is confirmed by the data received from the sensors of the women's smart phone an trigger is activated and help is directed towards that location using GPRS, upon a distress call from the woman the UATV will spring into action to protect the women and neutralize the attacker on receiving the confirmation from the command / control center. The acknowledgement from the command center will be issued based on the priority or severity of the situation. Once the UATV starts its operation footage of the same will be recorded for evidence purpose.

The execution of the UATV will be in two phases response phase and operation phase, being an unmanned vehicle it is possible to reach the location within minutes of crisis, The initial phase will be to assist or support the victim in case of emergency or need, the

secondary face will be to secure the victim and to nab the attackers which will be acknowledged to the command center and only after proper approval shall this phase be carried out until then the UATV will try to protect the victim from the attacker and not focus on the attacker. In the mean time the local authorities will be notified and help will also be on its way which makes this system the state-of-the-art type.

Cloud Computing

The UATV will make use of a technology known as DOPE (Data On Previous Encounters) which will be key in identifying the behavioral and characteristic traits of the user which will enable the drone to assess the severity and priority if the victim is in distress, The data required by the drone will be stored in cloud databases for faster and reliable access across the world. The database will contain vital parameter information, regular activities of the user including places travelled regularly and previous distress communication made which will be used to calculate the measures needed to be taken.

Internet Of Things (IoT)

Internet of things is represented as a network of connection where the nodes will be devices. The system makes it possible to make the devices operable in a smart and efficient manner. It is a connection of networks and its devices so the flow of data will be comparatively fast. The IoT has a self configuring capability based on various protocols and algorithms which are used to make the system efficient, reliable. In the proposed system IoT is used to operate the drone as the main flight controller / APU (Auto Pilot Unit) makes uses of data that comes from the sensor through the IoT channels as the entire sensor network will be a combination of various IoT sensor networks. Using IoT also helps to isolate the victim from the attacker as to identify who is the victim. Apart from which it uses IoT to track the victim using the GPRS data from cloud that comes from the smart device of the user.

The IoT network uses advanced imaging protocols to gather footage and send it to the evidence section of the cloud storage, Using IoT the calculations are made real time so as to predict the victim that requires immediate help or assistance, The use of IoT in this proposed system enables it to act autonomously which in turn enables the drone to reach the destination of the victim within minutes from the time of the crisis as begun, also the IoT network provides assistance for the drone to perform search and rescue which are very crucial aspects regarding to women safety which is the advantage of usage of IoT.

Working Mechanism

Each individual UATV will be an designated patrol path, The Drone will be powered by solar / lumen energy, the drone will also be powered by a taser /stun gun which will be used to neutralize attackers if situation demands. The patrol paths will be interconnected at points known as junction points where they will change the patrol path so as to maximize the effective area covered for each patrol. The UATV will have special units known as RTCU (Response Time Calculation Unit) which will be used to calculate the shortest path to the area of distress and also inter communicate between the drones on which drone shall reach the spot at optimal and fastest time.

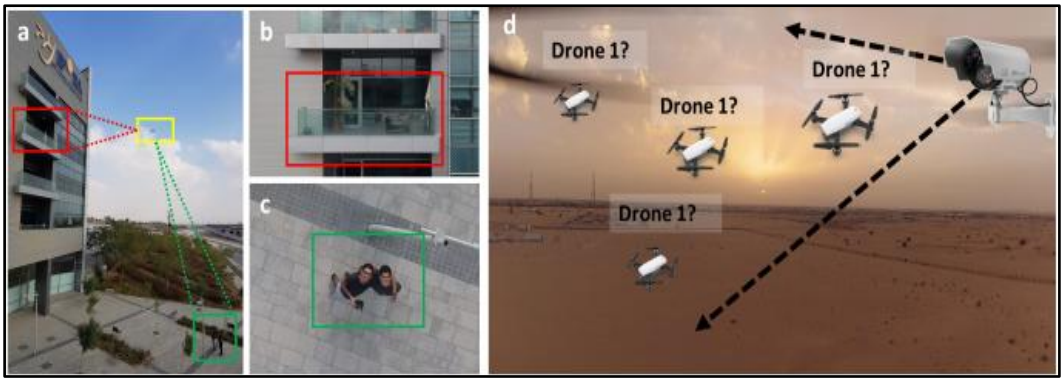


Fig1: Object classification and Identification

Upon arrival the drone starts its preliminary support phase where it warns the local authorities and also establishes communication with the command / control center, the video recording procedure will be immediately started so as to gather enough evidence if required for judicial purposes. In the initial phase the main aim of the proposed system will be to fend off any attackers from that site and also protect the victim from any other potential danger until proper rescue and support staff arrives at the spot of victim.

During the preliminary phase if the command center or the drones find that the situation is unfavorable or slipping out of control an acknowledgement will be sent to the command center and if the acknowledgement is acknowledged the drone follows its secondary phase of execution by following its protocols.

In the secondary phase the drone based on real-time calculations will determine the necessary protocol to be followed and will execute the operation so as to provide and assure the safety of the women. Only in this phase the drone will be allowed to use the offensive mechanism in it to neutralize the attackers. In the secondary phase the drone will also issue help requests and assign a warning tag which will contain the coordinates and other vital information required. The tag will be acknowledged by other drones and they will also proceed to the spot if demanded. When a warning tag is noted additional drones will be summoned so that the patrolling in other pats does not get disturbed or affected and the regular operation can carry out as usual.

The final protocol or the final phase of the operation which will be invoked only if a warning tag is issued will be to summon medical team and other necessary support for the victim who may include but not limited to alerting parents or other relatives / close acquaintance of the victim as a precautionary and safety measure. The proposed system thus provides complete safety to the user of the system by integrating various support elements and also various technologies to provide women safety.

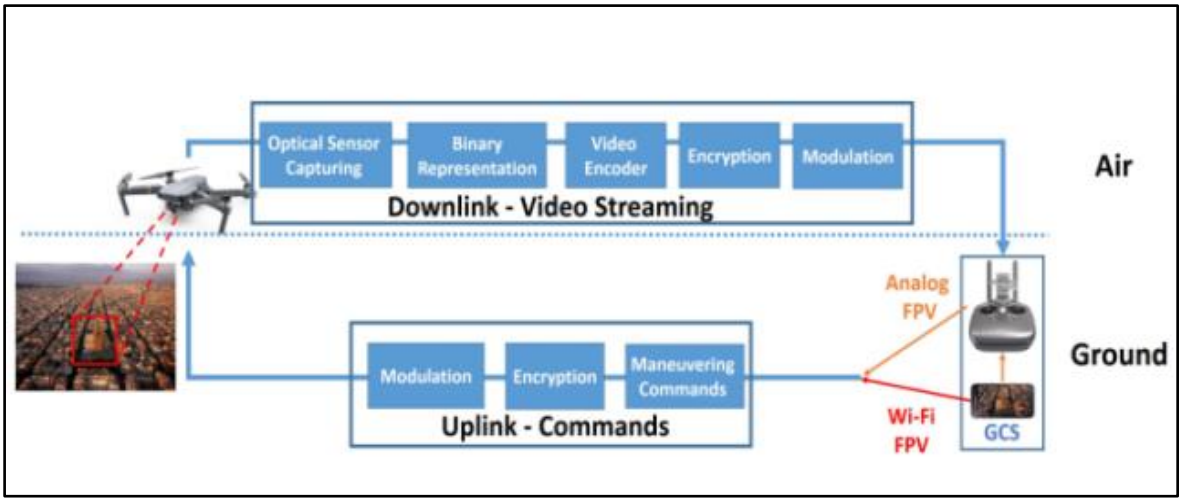


Fig 2: Control process of Drone

Construction And Analysis

A carbon fiber frame is best suited for the proposed system as carbon fiber provides an efficient balance between weight to efficiency ratio, The mobile and avionic section will be placed in a distributed manner so as to provide efficient center of gravity so that problems during takeoff and landing will be minimal and also the maneuverability of the drone which is very crucial and key aspect of the system. The power system will comprise of BLDC (Brushless Direct Current) motors and will comprise BEC ESC (Battery Eliminator Circuit Electronic Speed Controller) along with which a PDB (Power Distribution Board) for providing power required to operate the components of the proposed system. There will also be Li Po (Lithium polymer) battery circuit as an backup or auxiliary power backup unit in case of any malfunction with primary solar/ lumen power system.

The secondary component of the system will contain an video unit which will use VTX (Video Transmission Unit) and the communication unit will consist of GSM and

GPRS modules which will be used to retrieve and send information to the cloud, the information regarding the location and contacting of the support and medical representatives will be carried out by this communication unit. The Main control unit will be the flight data computer which will process the data from various sensory networks and make calculation real-time to be mobile and head in the right direction and also at an optimal pace and time.

The tertiary network will contain the data processing and information retrieval section in which the data from user will be used to calculate the trajectory and priority of the situation of the victim real time. The section will contain a computer capable of using given user data set by identifying the user and using the DOPE (Data On Previous Encounters) perform calculations to verify the authenticity and genuinely of the distress call made. This section will also be responsible to guide the system based on algorithms and protocols, the system will receive data from all the primary and secondary computers and also update the same to command center and also make sure the system behaves in the desired and proposed manner. This part of the system can also be called the CU (Control Unit) of the system.

The application will be constructed in such a way that the application will be present in cloud and will not require any installation in device this can be achieved with the help and consent of mobile manufacturers. This app at the time of alarming situation works by denoting the location of the victim and intimates the nearby command center with a emergency tag (2000 meters radius) and helps the drone reach immediately for help after informing the Police authorities as per its algorithm / protocol. When a phone is being logged in the application identifies male or female users and confirms the same after linking the same with Aadhar ID. The help can be accessed only after filling up of necessary details the application requires. This application is targeted on women safety in particular .There are many apps that are available for Girl child safety , but whether they are put to proper use and whether the target audience has an idea about such app is questionable. In order to make sure the target audience uses this application.

TABLE I
TYPES OF DRONES

Category	Weight	Operating Altitude	Range	Payload
Nano	<0.2 kg	<90	90 m	<0.2 kg
Micro	0.25-2 kg	<90 m	5 km	0.2-0.5 kg
Mini	2-20 kg	<900 m	25 km	0.5-10 kg
Small	<150 kg	<1500 m	50-100 km	5-50 kg
Tactical	>150 kg	<3000 m	>200 km	25-200 kg

TABLE II
OSI MODEL OF DJI SPARK (WI-FI FPV DRONE)

Layer 7 - Application	Linux
Layer 6 - Presentation	RTP
Layer 5 - Session	
Layer 4 - Transport	UDP
Layer 3 - IP	IPv4
Layer 2 - Data Link	IEEE
Layer 1- Physical	802.11n

Review Of Literature

Hency Thacker December 1, 2019, Orange The World – Apps for Women's Safety in India In the CSR Journal said, The Circle of 6 app allows users to program six friends into a "circle". It has pre-programmed SMS messages, such as "call and pretend you need me. I need an interruption" or "come and get me, I need help getting home safely" that can be easily sent to the programmed circle. The user's location is also sent to the circle along with these messages. The app also has hotline numbers for sexual assault, rape and abuse preinstalled in it. Every action can be completed with a minimal number of taps, making it easier to use in an uncomfortable or threatening situation. The app is also available in Hindi. Apart from that he added that the rapid technological development especially in the field of automation and IoT has enabled robotics and robotic process automation much simple and also this rapid development and the new digitalization will be beneficial with applications such as the group of 6 and so on.

Professor Sankalp Mehta , SachinJanawade 2 , Vinayak Kittur3 , Suraj Munnole 4 , Sandhya Basannavar5 Assistant professor ,2017, IJESC , An Android based Application for Girl child Security says there is a variety of applications

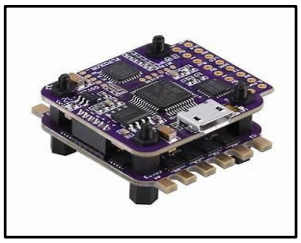
for women protection when they are in dangerous situation. The draw back in this existing app is it alerts only to the saved contacts, the GPS system support only to specific range which need to be enhanced in such a way that is it don't sends the alert message to nearby(less than75 meters) cell phones. He also added that women safety is a very important society aspect and women safety must be given at most importance because countries like India which are future super powers need to have higher GDP and development rate and considering the fact that literacy rates are steadily climbing and women account to almost 40 percent of the population only when there is combined workforce shall we achieve success but the problem that is prevailing in the society is the main reason why it is not achievable.

The Literature review states that women safety is at present a very crucial and key aspect to be achieved in the society because as discussed above it might have national impact and also it is noted that there are a variety of different applications that are categorized as women safety application but fail to target the exact audience thus not fulfilling the exact purpose they are meant to. On the contrary there are other apps that are very efficient but have less popularity due to lack of awareness and also utterly fail due to that. Another very important thing is that everything regarding to women safety is material but not physical like our proposed system. Our system will thus be one of its kind systems with cutting edge technology and progress forward. Thinking realistic we can see that every time an application cannot save us at the time of imminent danger so our proposed system will be the solution to address problems like this and provide safety for women.

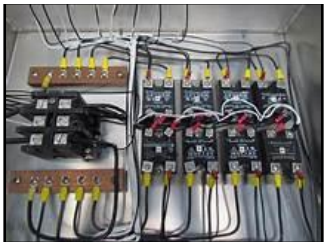
Components Used

Carbon Fiber Frame

Electronic Speed Controller

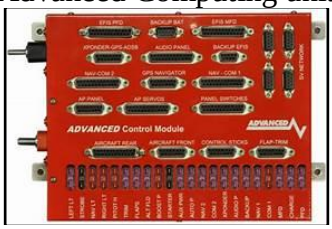


Power Distribution Board



Flight Controlled Unit

Advanced Computing unit



GSM / GPRS Modules

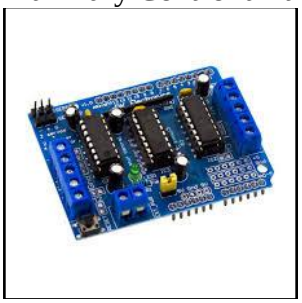
High Definition Camera

Servo Motors

Lithium Polymer Battery

Solar / Lumen Power Source

Auxiliary Control unit



Control View Unit (VTX)

Existing Model

TABLE III
COMPARISON OF TOP COMMERCIAL DRONES

		FPV		Functionality				Characteristics							
Manufacturer	Name	Wi-Fi	Analog	Follow Me	RTH	Automatic Navigation	Smart Capture	Flight Range (km)	Speed (km/h)	Flight Time (m)	Weight (g)	Altitude (km)	Video Resolution	Date	Price ($)
DJI	Matrice 600 Pro		✓	✓	✓	✓		5	65	32 -38	9500	2.5-4.5	4K	2016	4999
	Mavic 2 Pro	✓	✓	✓	✓	✓	✓	8	72	31	907	6	4K	2018	1499
	Spark	✓		✓	✓	✓	✓	2	50	16	300	4	1080p	2017	399
	Inspire 2		✓	✓	✓	✓		7	94	23-27	3440	2.5-5	4K	2016	2999
	Phantom 4 Pro		✓	✓	✓	✓	✓	7	72	30	1388		4K	2016	1499
	Mavic Air	✓	✓	✓	✓	✓	✓	2	68.4	21	430	5	4K	2018	799
	Tello	✓						0.1	28.8	13	80	0.1	720p	2018	99
Parrot	Bebop 2	✓		✓	✓	✓		2	64	30	525	0.1	1080p	2017	399
	Anafi	✓		✓	✓	✓		4	53	25	312	4	4K	2018	599
Yuneec	Mantis Q		✓	✓	✓	✓		1.5	70	33	479		4K	2018	499
	Typhoon 4K		✓	✓	✓	✓		0.6	30	25	200	0.1	4K	2015	499
	Typhoon H Plus		✓	✓	✓	✓		1.2	48	30	1995	0.5	4K	2018	1899
Skydio	R1	✓		✓				0.1	40	16	997	0.1	4K	2018	1999
Rabing	Rabing Mini	✓						0.1	20	10	90	0.1	720p	2017	70
HASAKEE	H1	✓						0.05	20	7	50	0.05	0.3MP	2018	83
Holy Stone	HS190		✓					0.05	15	7	25	0.05	0.3MP	2017	35
TOZO	Q2020		✓					0.045	12	8	50	0.045	NO	2017	60

Challenges

TABLE IV
THREATS MAPPED TO TYPES OF DRONES

	Privacy		Physical Attacks	Crime	Cyber Attacks
	Video Streaming	Carrying Surveillance Equipment			
Nano	✓		Targeted assassination [45]	Targeting homes for burglaries [46]	
Micro	✓	3D mapping using radio transceiver [47] MITM attacks against cellular networks [48] Tracking a person according to his/her devices [49]	Carrying radioactive sand [50]	Smuggling goods into prison yards [12]	
Mini	✓	✓	Carrying a bomb [16]; colliding with an airplane [51], [52]	Hijacking radio controlled devices [53], [24] Smuggling goods between countries [13], [14], [15]	Establishing a covert channel [54], [55]
Swarm	✓	✓	Multiple casualty incidents [56]	Cyber warfare [57]	

TABLE V
EFFECTIVENESS OF SENSORS TO VARIOUS ENVIRONMENTAL CONDITIONS

	Sensor's Effectiveness for Detection					
	RF		Optical			Acoustical
Factor	Active Radar	RF Scanners	VIS	IR	LiDAR	
Light	✓	✓	✓		✓	✓
Darkness	✓	✓		✓	✓	✓
Noise	✓	✓	✓	✓	✓	
Birds		✓				✓
Adverse Weather Conditions						
Drone Identification		✓	✓	Limited		✓
Autonomous Drone Detection			✓	✓	✓	✓
Multiple Drone Detection	✓	Only if drones use different channels	✓	✓	✓	Only different types of drones
Cost		✓	✓			✓
Long Range Detection	✓	✓	Require focusing lens		✓	
Immunity to NLOS		✓				✓
Locating	✓	Multiple	✓	✓	✓	Multiple

TABLE VI
CHARACTERISTICS OF COMMERCIAL DEVICES FOR DRONE DETECTION

		Radio		Optical				Acoustic	Features				
Company Name	Product Name	Radar	RF Scanner	Camera	LiDAR	Electro-optical Camera	Thermal	Microphone	Detection Range (KM)	Identification	Angle	Locating	Mobility
3DEO	Rogue Drone Detection & Mitigation [103]				✓				2			✓	
Aaronia	Drone Detection System [82]	✓		✓			✓		50	✓		✓	✓
Anti-Drone.eu	GROK [83]	✓							4	✓		✓	
	Droneshield [104]							✓	0.5				
Aveillant	Gamekeeper 16U - Holographic Radar [84]	✓							5			✓	
Black Sage - BST	UAVX [85]	✓		✓			✓		0.5		90	✓	✓
C speed LLC	LightWave Radar [86]	✓										✓	
CACI	SkyTracker [105]		✓							✓			
CerbAir	DroneWatch [106]		✓						1			✓	✓
Chess Dynamics Ltd	AUDS [87]	✓				✓	✓		10		180	✓	✓
DeDrone.com	DroneTracker [107]		✓	✓						✓			✓
DeTect	DroneWatcher [108]		✓						1.6-3.2	✓			✓
	HARRIER DSR [88]	✓		✓				✓	3.2	✓		✓	
Digital Global Systems	SigBASE [109]		✓										✓
DroneShield	FarAlert/WideAlet Sensors [110]						✓	✓	1		30		✓
Gryphon Sensors	Skylight [89]	✓	✓			✓	✓		3-10		360	✓	✓
HGH Infrared Systems	UAV Detection & Tracking [111]			✓	✓		✓				360		
Kelvin Hughes Limited	SharpEye SxV Radar [90]	✓		✓			✓		1.5		360	✓	✓
MAGNA	Drone Detection [112]			✓			✓	✓	0.5-1				
Microflown AVISA	Skysentry AMMS [113]		✓					✓	0.4-1		360	✓	
Mistral Solutions	Drone Detection and Classification System [114]		✓	✓			✓		1	✓			
ORELIA	Drone-Detector [115]							✓	0.1		360		
Quanergy Systems	Q-Guard - LiDar X-Drone [116]				✓				0.1				
Rinicom	SKY PATRIOT [117]			✓		✓	✓		0.8	✓			
Rinicom and METIS Aerospace	SKYPERION [118]		✓					✓					
ROBIN Radar Systems	ELVIRA [91]	✓		✓								✓	✓
Rohde and Schwarz	R&S ARDRONIS-I [119]		✓						1-2	✓			
SAAB Group	Giraffe AMB Radar - ELSS [92]	✓							30-470		360	✓	✓
Sensofusion	AIRFENCE [120]		✓										✓
SpotterRF	A2000 Radar UAVX [93]	✓							0.2-1		45/90	✓	✓
Squarehead Technology	DiscovAir [121]							✓					
TCI International	BlackBird [122]		✓										✓
Thales	SQUIRE [94]	✓					✓		48			✓	✓

TABLE VII
ANTI DRONE METHODS COMPARISON

	Methods	Effectiveness			Results & Countermeasures			
	Type	Wi-Fi FPV Drones	Proprietary FPV Drone	LOS Independent	Denial of Service	Aerial Hijacking	Violating Confidentiality	Countermeasure
Protocol	Deauthentication [157], [158]	✓		✓	✓	✓		Using WPA
	Flooding NIC [159]	✓		✓	✓			
	Deleting Stored Videos [158]	✓		✓				
	Replay Attacks [160], [161]		✓	✓		✓		Operator's Authentication [162]
	Detecting Captured POI [151]	✓					✓	Disabling Video Compression
Spoofing Sensors	Camera [163]	✓	✓			Shifting		
	GPS [164], [165], [158]	✓	✓	✓	Force Landing	During RTH Mission		Anti GPS Spoofing [166], [167]
	Motion Sensors [168]	✓	✓	✓	Landing			Software Based Solution [169]
	Magnometer [158]	✓	✓	✓	Force Calibration			
Compromised Component	Fake Propeller [170]	✓	✓	✓	Crashing			Parachute [171], [172], [173]
	Compromised Firmware [174], [164]	✓	✓	✓		Using a Backdoor		Control Flow Approach [175]
Jammers	GPS [158]	✓	✓	✓	Drifting, Loss of Control			
	FPV Channel [164]	✓	✓	✓	Disabling FPV			
Physical Attacks	Nets	✓	✓		Landing, Crashing			
	Bullets	✓	✓		Crashing			Parachute [171], [172], [173]
	Lasers	✓	✓		Crashing			Mirrors, Smoke
	Missiles	✓	✓		Crashing			
	Predator Birds	✓	✓		Landing			

Conclusion

Thus, to sum up all the discussed points the main aim of the proposed system will be to render safety services to women when in distress. The UATV will use the latest cutting-edge technology and software to efficiently provide security, support assistance to women. The usage of technologies such as cloud computing and IoT will enable the UATV to be efficient and reliable, though at current there are many solutions to provide women safety the proposed system will be capable of providing the at most care comparatively at any given period of time.

Apart from providing safety to women the proposed system will also be able to defend women from various attacks as in the recent times the number of attacks and violence's committed towards women are increasing in an astonishing rate and current laws are not able to punish those who are guilty in a proper and timely manner. The current laws have also failed to put people under check, the only solution will be the deployment of the proposed system. The system also has enough potential to eradicate other problems faced by women in this society, The key highlight of the system is that the system can neutralize or hold off attackers so as to provide additional support to stop violence's against women. The system is also capable of helping and assisting of search and rescue missions also it is very much usable to isolate and track potential attackers based on the DOPE system and prevent harassments even before they occur which makes the system one of its kind cutting edge system.

Result

The system is designed to provide safety to women. The proposed system will be able to defend women from various attacks, as in the recent times the number of attacks and violence's committed towards women are increasing in an astonishing rate. Current laws are not able to punish those who are guilty and have terribly failed to put people under check. The solution to deploy the proposed system will also eradicate other problems faced by women in the society. Thus, the main aim of the proposed system will be to render safety services to women by making use of the latest cutting-edge technology and software's to efficiently provide security, support and assistance to women.

The key highlight of the system to neutralize or hold off attackers until additional support arrives makes it very useful to stop violence's committed against women. The system is capable of helping, assisting and also independently carry out search and rescue missions, able to isolate and track potential attackers based on the DOPE system and prevent harassments even before they occur. which makes the system one of its kind cutting edge system. The usage of technologies such as cloud computing and IoT enables the UATV to be efficient and reliable, though at current there are many solutions to provide women safety the proposed system will be capable of providing the at most care comparatively at any given period of time.

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APPLICATION OF ALTMAN'S Z SCORE MODEL IN DETERMINING THE FINANCIAL RELIABILITY OF SELECTED PLASTIC COMPANIES IN INDIA

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ABSTRACT

Financial Health of the firm is one of the most crucial aspects for the stakeholders, they all wish to know whether the organization will do better in future in order to keep their interest intact with the organization. There are two main parties which are interested in the company's performance and growth. They are the internal users of information and external users of information. Internal users comprise of shareholders, officers, managers, employees and internal auditors. The Altman"s Z Score Model which is a combination of five weighted business ratios that is used to estimate the likelihood of financial distress is the most used model to predict bankruptcy. It was developed in 1968 by Edward I. Altman, an Assistant Professor of Finance at New York University, as a quantitative balance-sheet method of determining a company's financial health. It has been proven to be a reliable tool across the globe. As per the model, bankruptcy could be predicted two years prior to the happening on the event in India. In conclusion, the Altman Z score can be applied to other Indian companies to predict bankruptcy and measure its financial health.

Keywords: *Altman Z Score, Financial Health, GNPAs and Net Profits*

Introduction:

In the present scenario of business, the enhancing uncertainty scenario takes away the safekeeping of existence from firms. Perhaps to be confident of the longevity of the firm becomes the prime issue of concern by all the business houses. Z score is an analytical way of screening the financial soundness of a company. It is the easiest accessible tool for any investor or stakeholder. It provides a clear lead to evaluate and understand the company's financial position Most of the organizations exist with an objective of profit maximization. To achieve profit maximization objective, firm needs strong internal and external support. The failure of internal support system such as effective utilization of funds, labour, material etc. And external support system such as economic, political and socio-cultural conditions results in Bankruptcy of the organization. In order to predict the bankruptcy or financial distress or financial health or financial performance of a company Altman z-score is used. Z-score value is calculated by using ratio analysis.

The Z-score formula for predicting bankruptcy was published in 1968 by Edward I. Altman, an Assistant Professor of Finance at New York University. The formula may be used to predict the probability that a firm will go into bankruptcy within two years. Z-scores are used to predict corporate defaults and an easy-to-calculate control measure for the financial distress status of companies in academic studies. The Z-score uses multiple corporate income and balance sheet values to measure the financial health of the company. In this model, if the Z value is greater than 2.6, then the firm is said to be in the "safe zone" and has a negligible probability of filing a bankruptcy. If the Z value is between 2.6 and 1.1, then the firm is said to be in the "grey zone" and has a moderate chance of bankruptcy.If the Z value is below 1.1, then it is said to be in the "distress zone" and has a very high probability of reaching the stage of bankruptcy.

Altman z-score predicts the performance analysis of company in past as well as next 2years performance or financial health. It uses five elements such as total assets or total liabilities, earnings before interest and tax, retained earnings, market value or book value of equity to find the distress status of a company. Among many z-scores models Altman z-score is the most accurate model.

Altman Z-Score Model: Credit risk. The Altman Z-score has become a reliable measure of calculating credit risk. - NYU Stern Finance Professor Edward Altman developed the Altman Z-score formula in 1967, and it was published in 1968. Over the years, Altman has continued to reevaluate his Z-score over the years. From 1969 until 1975, Altman looked at 86 companies in distress, then 110 from 1976 to 1995, and finally 120 from 1996 to 1999, finding that the Z-score had an accuracy of between 82% and 94%. In 2012, he released an

updated version called the Altman Z-score Plus that one can use to evaluate public and private companies, manufacturing and non-manufacturing companies, and U.S. and non-U.S. companies.

Review of literature:

Financial health of any business enterprise may be effortlessly evaluated via its profitability, liquidity, solvency and activity ratios. Z-score is one of the simplest and competent tools to assess the soundness of an enterprise. On this paper the financial health and the possibilities of financial disaster of RCFL inside the near future are evaluated with the assist of Z score. VIKASH SAINI (2018) The Z score value suggests that the firm is in distress area and may reach bankrupt in near future. Therefore, it requires various efforts of all the concerned people including management, personnel and different stake holders. HAYELOM ABRHA MERESSA (2018) The motive of this study is to evaluate financial distress conditions of Ethiopian micro finance institutions (MFIs) making use of Edward Altman's revised Z-score model, with the usage of secondary statistics. The study revealed that 94% of MFIs are within the secure sector and 6% within the grey sector. The finding of the study additionally shows the fluctuation in rating of the institutions. In view of this, the paper is expected to be used as input to policy makers and practitioners as it provides empirical evidence on economic distress situation of MFIs. MAURICIO TAKAHASHI ETL (2018) This study examined the accuracy of the Altman bankruptcy prediction model for a large number of private organizations' that went bankrupt. Financial ratios used within the model calculations, Z score (Altman's Z for non-public groups) provide indication of solvency and probability for privately held agencies. The findings do not support the declaration that the Z-score can be generalized to nations and sectors specific. The general quantity of bankruptcies may be variable to financial and/or economic crises; however, the effects suggest an accurate identification of financial disaster risk simplest to two thirds of the sample of companies. GEORGE OCHIRI (2017) This paper helps to look at the economic strength of banks listed and unlisted at Nairobi stock exchange, Kenya using the Altman Z score. The CBK have the regulatory mandate to keep a check on the health of the banks keeping in mind the Kenyan financial system largely depends on banks. Following the various financial institution mess ups in Kenya, the CBK and the Kenya Bankers association were pushing for development which includes transparency on commercial banks. A. GEETHALAKSHMI ETL (2017) The study concludes that companies ought to make an intensive effort in maximizing wealth and minimizing liabilities so that usual Pharmaceutical businesses economic health can be precise and it is able to grow in the future in all factors. Traders put money into a business enterprise after evaluating its financial performances. If the performance is volatile then it is able to have an effect on adversely at the decision concerning the investment of the traders. So, this evaluation must be achieved very carefully and rationally. YU LU ETL (2016) This study empirically examines the connection between good and financial distress listed companies. This paper examines whether or not excessive audit assessment can reduce the chance of financial distress, particularly in high boom companies and government owned firms. Effects indicate that the top-notch of the external audit has a poor courting with economic distress. In addition, for high boom firms, consequences show that the relationship among audit quality and financial distress is extra enormous. BASMAN OMAR AL-DALAYEEN (2016) Diverse tools are used for assessing the financial health of the groups for shareholders, authorities, bankers, lenders, financial institutions and many others. They rely at the profitability and solvency ratios of the corporation. However, the absolute figures in the financial statements do not serve the purpose as it only indicates absolute year end position and cannot be guide for the future. Edward I Altman, Professor of Finance at big apple university evolved a model popularly called "Z-Score model" to predict the financial health of the corporate. EPHREM GEBRESLASSIE ETL (2015) The contemporary fashion in Ethiopian banking enterprise is that it is displaying development in overall performance and almost all banks are reporting fine accounting earnings. But

worthwhile businesses must not be a guarantee that the corporations can live on to meets its liabilities. Primarily based on this fact, attempts are made to discover the financial distress situations and its determinants in selected non-public industrial banks in Ethiopia. The outcome indicates that the financial health of the chosen private commercial banks is good and improving from time to time, however a few fluctuating data is discovered. NICOLETA BARBUTA-MISU (2014) In this study, the financial loss threat of the corporations covered by Romanian building sectors evaluated. The principal objective of this paper is to provide the scoring approach and categorizing of corporations into a successful and bankrupt corporation in line with their financial performance To reap this goal, the author used two famous models: Conan & Holder, and Altman. The consequences might also represent a landmark for Romanian corporations in substantiating decisions and in order to analyze the economic failure. ERVINA ALFAN (2013) Using financial ratios and Altman z-rating, this project evaluates the overall performance of construction businesses in Malaysia, in the course of and after the crisis. In addition to that, it assesses and predicts the future performance of these companies based totally on data over six years. The results have proven that the overall financial performance of the contractors in Hong Kong, as sampled were deteriorating very fast within the period of last few years. The outcomes of all economic ratios, together with the triumphing state of affairs of over competition, inelasticity of production fees and reduced aggregate demand in Malaysia has discovered the acute difficulty of reversing the economic overall performance in the coming years. KOSMAS KOSMIDIS ETL (2011) The objective is to consider the issue of financial distress. Author has developed an accounting model for the financial distress projections. The main objective of this paper is to provide prediction of financial stress in order to guide the management for action for change in policies for remedial measures. The study includes multiple analysis and logit analysis for the model construction. The outcome indicates that the logit outperforms the MDA model in terms of accuracy.

TABLE -1 Altman Z-Score Old and Revised Versions:

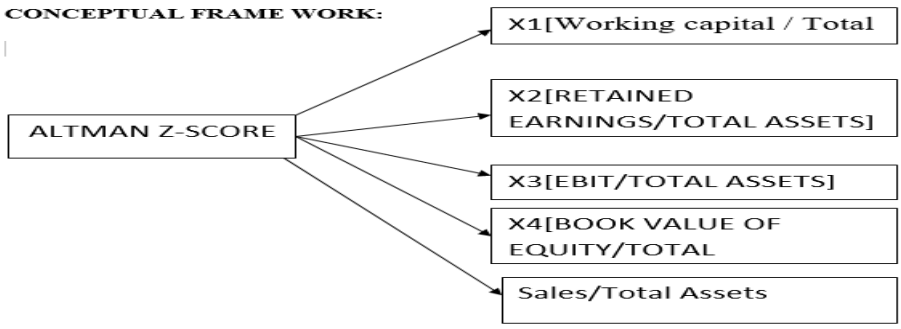
Nature of the firm	Manufacturing Companies (OLD VERSION)	Private Companies (NEW VERSION)	Non-manufacturing Companies (NEW VERSION)	Non-manufacturing and emerging markets (NEW VERSION)
X1	Working capital / Total Assets	Working capital / Total Assets	Working capital / Total Assets	Working capital / Total Assets
X2	Retained earnings / Total Assets	Retained earnings / Total Assets	Retained earnings / Total Assets	Retained earnings / Total Assets
X3	EBIT / Total Assets	EBIT / Total Assets	EBIT / Total Assets	EBIT / Total Assets
X4	Market value of equity / book value of total liabilities	Market value of equity / book value of total liabilities	Market value of equity / book value of total liabilities	Market value of equity / book value of total liabilities
X5	sales/Total Assets	sales/Total Assets	_	_
Z-score	1.21X1+1.4X2+3.3X3+0.6X4 + 1.0 X5	0.717X1+0.847X2+3.107X3+0.420X4+0.998X5	6.56X1+3.26X2+6.72X3+1.05X4	3.25+6.56X1+3.26X2+6.72X3+1.05X4
Discriminations	Z > 2.99 “Safe” zone 1.81 <Z<2.99 “Gray” Zone Z<1.81 “Distress” Zone	Z>2.9“Safe” Zone 1.23<Z“<2.9“Gray” Zone Z“<1.23“Distress” Zone	Z>2.60“Safe” Zone 1.10<Z<2.60“Gray” Zone<1.10“Distress” Zone	Z>2.60“Safe” Zone 1.10<Z<2.60“Gray” Zone Z < 1.10 “Distress” Zone

Statement of Problem: Change is inevitable. It is very important to understand that the only thing that is constant in the world of business environment is change. An organization that is going on well might ignore to introspect themselves on a timely manner. It is very important for the investors, creditors, underwriters, credit rating agencies, banks, auditors and the organization itself to analyze the financial position for their interest. Though, a basic analysis with regard to the financial position is made it is very important to apply the proven models under forensic accounting in order to understand the ranking of the organization.

Objectives of the study:

1) To evaluate the financial soundness of select PVC Pipes company based on the Altman's Z-Score model.
2) To determine the relationship between Altman's Z-Score, GNPAs and Net Profits
3) To analyze the impact of the components of Altman's Z-Score on the Altman's Z-Score.

Conceptual Model:



Research Methodology:

The secondary data were obtained from the annual reports of the ten public sector banks. Additional data for analysis and verification, were sourced from www.moneycontrol.com. The data were subjected to certain fundamental mathematical operations such as computing the ratios, before being used for the analysis. Period of the Study The period of study was 5 years from 2015-2016 to 2019-2020.Stastical Tools used in the Study Altman's Z-Score model was primarily used, to determine the financial health of the select PVC Pipes company.

Data Analysis:

Altman z-score is an important tool that predicts the financial health of companies and categorizes into three zones as, Z > 2.99 "Safe" zone, 1.81 <Z<2.99 "Gray" Zone, Z<1.81 "Distress" Zone. In this model "safe" zone indicate negligible probability of filing bankruptcy. If company is in grey zone that indicates moderate probability of bankruptcy. And finally, if the z- score value is below 1.81 then it is said to be in the distress zone that indicates very high probability of reaching the stage of bankruptcy

Altman z-score = 1.21X1+1.4X2+3.3X3+0.6X4 + 1.0 X5

TABLE: 1 The Value of Elements Of Z-Score (WC, TA, Tl, RE, EBIT, MVE, Sales) From 2015-16 To 2019-20(₹ In Crores)

YEARS PARTICULARS	2015-16 (₹)	2016-17 (₹)	2017-18 (₹)	2018-19 (₹)	2019-20 (₹)
Total Assets	7,80,69,347	9,32,61,506	9,5067406	80661645	90827308
Total Liabilities	57897634	74589763	89354821	79084105	73586218
Working Capital	26683921	18823346	26273412	32843817	21579752
Retained Earnings	49,594	4,29,872	4,64,447	10,11,646	14,25908
EBIT	-832333	-1214574	-433061	-1382416	-543698
Book Value of Equity	39120062	53471728	50652954	48208099	49345276
Sales	356019032	360160508	261410580	356574550	346259760

Above table represents values of total assets, total liabilities, working capital, retained earnings, book value of equity and sales of Anantha Pvc from 2015-16 to 2019-20. Assets and liabilities are increasing from 2015-18 and total assets are decreasing from 2018-19, increasing in 2019-20 and liabilities also decreasing from 2018-19 to 2019-20 but Total assets are more than Total liabilities, whereas current assets are more than current liabilities

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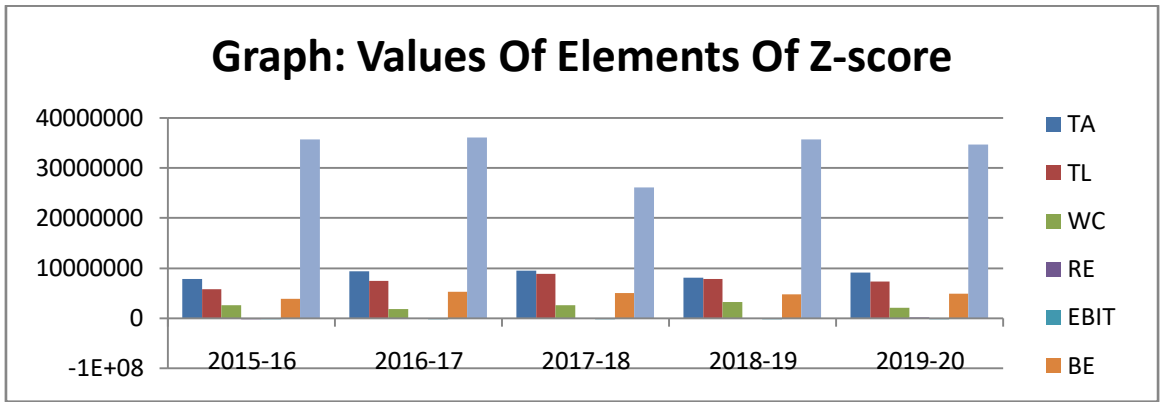

The Indian PVC pipes and fittings industry, which comprises of segments such as RPVC, PVC and CPVC pipes and fittings has grown significantly over the last few years due to the increase in the demand from irrigation sector on account of the burgeoning population and uncertain weather conditions in the country. The PVC pipes and fittings industry in India is highly fragmented. "PVC pipes will gradually replace conventional piping systems in the market due to their lower cost and higher durability. CPVC pipes. CPVC pipes are expected to register fastest growth in terms of the production capacity in the next 5 years from FY'2015- FY'2020. Rising acceptance of CPVC pipes over galvanized or PVC pipes will lead to the growth in the future.

Conclusion:

Assets and liabilities of the company has increasing from 2015-18 and total assets are decreasing from 2018-19, increasing in 2019-20 and liabilities also decreasing from 2018-19 to 2019-20 but Total assets are more than Total liabilities. As z- score in 2015-16 to 2019-2020 z-score value is above 2.60 i.e., "SAFE ZONE" and it has a negligible probability of filing a bankruptcy. Working capital from 2015-16 to 2016-17 decreasing and from 2017-18 to 2018-19 decreasing, again decrease in 2019-20. In working capital current assets are more than current liabilities. EBIT value is negative throughout the study period. Overall financial health, performance of PVC Pipes company is good as, it is in "Safe Zone" from 2015-16 to 2019-20 which indicates that there is less chance of bankruptcy.

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A REVIEW PAPER ON ARTIFICIAL INTELLIGENCE FOR HUMAN RESOURCES MANAGEMENT

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ABSTRACT

The concept of artificial intelligence in human resource management is still disputed, and experts are currently debating whether artificial intelligence is a benefit or a curse for humanity as a whole. Initially, HR departments were opposed to the AI system owing to concerns about job loss and greater reliance on robots and machines. However, the situation eventually shifted. Technologies and techniques like as e-recruitment, Human Resources Analytics, Cloud Computing, Management Information Systems, and computerised performance monitoring have decreased the workload of HR employees, allowing them to focus on other organisational goals and objectives. These study focuses on the many benefits and drawbacks of intelligent machines, as well as the overall influence of artificial intelligence on management of human resources.

Keywords: *artificial intelligence, technology, HR, workload, machine.*

Introduction

This review paper we will put some light in various aspect of Artificial intelligence by referring few literature on Empirical study on Artificial intelligent in Human resource department and its limitations This research paper majorly talks about artificial intelligence (AI) and how it is used in the human resource management (HRM). The topic is very relevant today because the usage of AI in HRM is growing and will continue to grow in the next years leading to the point when most HR professionals will use AI in some form in their everyday job. This is proven by the current state of literature, published by people specialised in HR and AI.

Keywords

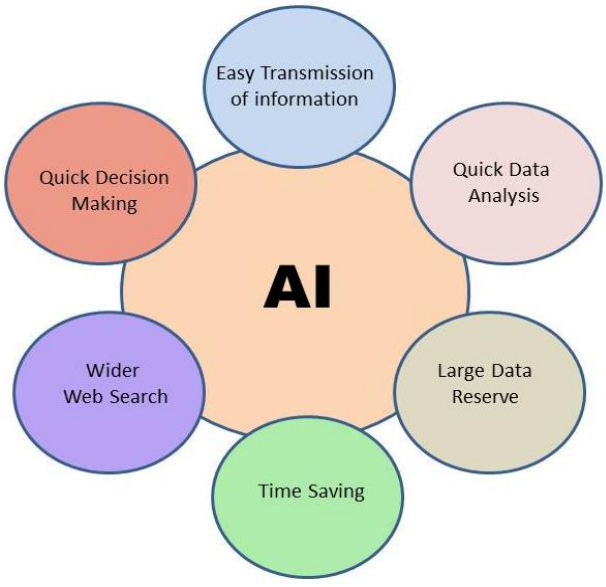
HR-Human Resources
HRM- Human Resource Management
AI-Artificial Intelligence
IT-Information Technology
R & D- Learning and Development

Literature Survey

As of current scenario total number of companies with HR, the usage of AI technology is still relatively small. AI is mostly used in larger companies and in specific industries, which is sensible due to the cost and benefit factors. It does not change the fact that the usage is growing and someday even the smaller firms will be taking advantage of AI. This this review paper we will also see various limitations for usage of AI in HRM The research shows it brings on many benefits to the company, saves them money and makes them more efficient. This paper will discuss more about the advantages and disadvantages of the subject.

AI has wide range of applications which are explored and documented on a day to day basis which helps in techno innovative solutions for the modern world. These solutions and benefits would increase the efficiency, effectiveness, productivity and performance of employees with bench marking of standards.

These would ensure that there is a major transformation which could happen in HR systems and processes. The Benefits of AI is clearly illustrated in the picture below:



Source: (Hossin et al., 2021)

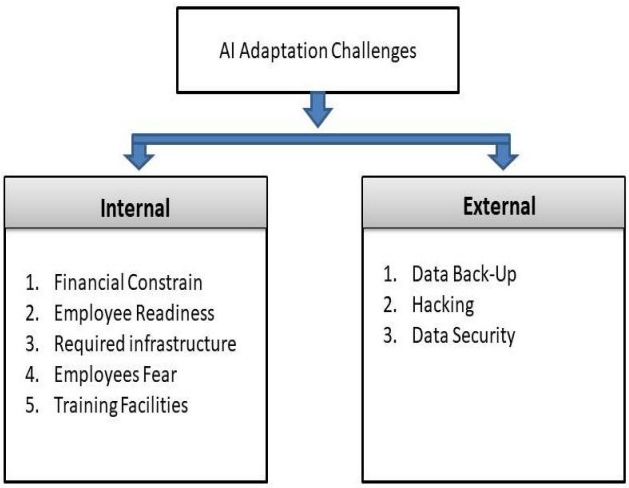
The above picture shows the various benefits of AI which enables quick decision making, time saving, data analysis and effective transmission of information.

(Di Vaio, Palladino, Hassan, & Escobar, 2020) had done a systematic literature review on AI and development of business model for sustainable development and progress.

The study found that AI would contribute to innovations which would provide products which can enable sustainable development of economies.

Although modern HR practices and systems have been implemented in Bangladeshi organizations, we could find that AI based studies and (Mahmudul Islam Choudhury, 2020; Mathur; Spadafora, 2016) its applications are less prevalent in this country. These studies illustrate that AI can replace human engagement and involvement totally.

AI can aid in effectively managing both internal and external constraints which are prevalent in the organization which could be financial, training, data backup, employee commitment and dedication & other issues related to data management and control. This provides a wide range of possibilities and applications of AI which has to be explored and investigated with empirical dimension. This would provide more support and give more confidence for companies to implement AI for HRM applications. The AI adaptation challenges in Bangladeshi organizations are provided below:



Source: (Hossin et al., 2021)

The study concludes that there is a need for more empirical studies on employee perception and implementation of AI in HRM related issues.

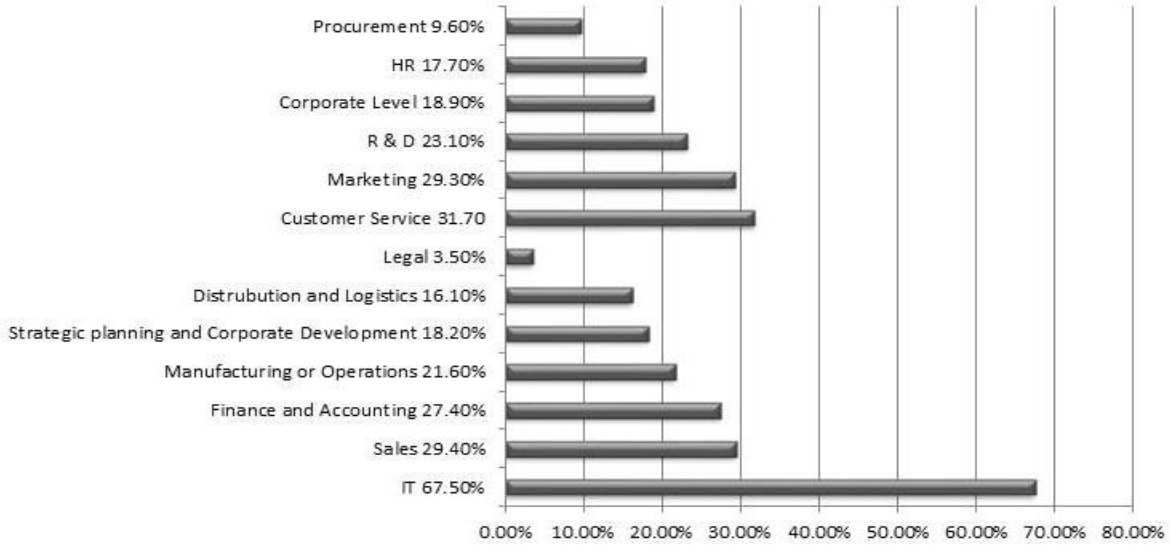
(JAWALKAR, 2020) had done a study to identify AI as the new talent in Human resource management practices. The study identifies the new practices of HRM using AI & how some companies still prefer to use the traditional modes of HR practices. The study has used primary data and opinions from 61 HR professionals have been collected for the study. Most of them are aware of AI and had opined that AI is the new talent in HRM practices.

(Kulkarni, 2020) had done a research on AI applications on human resource management and has opined that AI had brought in lot of transparency in HR systems and practices. AI assists in identifying the behaviour patterns of employees and provides them with specific compensations as indicated. Perceptual and attitudinal bias which is prevalent in the systems could be eliminated.

(Thamodaran, 2020) had done a study to find out the impact of AI practices in HRM. A conceptual model has been provided in this study which evaluates the various applications of AI on HRM. AI assists in candidate selection, training and performance management of employees.

The common areas in which AI is used would include: customer analytics, supply chain analytics, fraud and risk management along with sales forecasting. The usage of AI in HR process is clearly provided in the chart below:

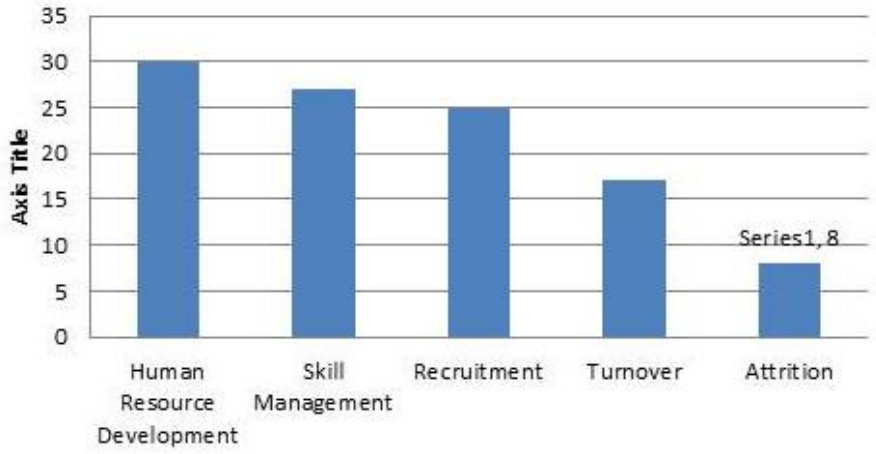
AI and HR applications



Source: (TCSGlobalTrend, 2017)

The above chart clearly states that HR is used among 18% of companies. R and D, manufacturing along with IT are the benefits which are obtained by companies using AI.
(Berhil, Benlahmar, & Labani, 2020) had done a systematic literature review on AI and its services for HRM. In this review paper it is found that various IT solutions have been provided from 2000 till 2018 for HRM practices which is traced in this article. The study firmly concludes that HR analytics would transform business performances and efficiencies of organizations. The study has also provided various IT solutions for various HR related issues which are prevalent in organizations which is presented as a chart below:

HR issues and IT based solution-Research Papers



Source: (Berhil et al., 2020)

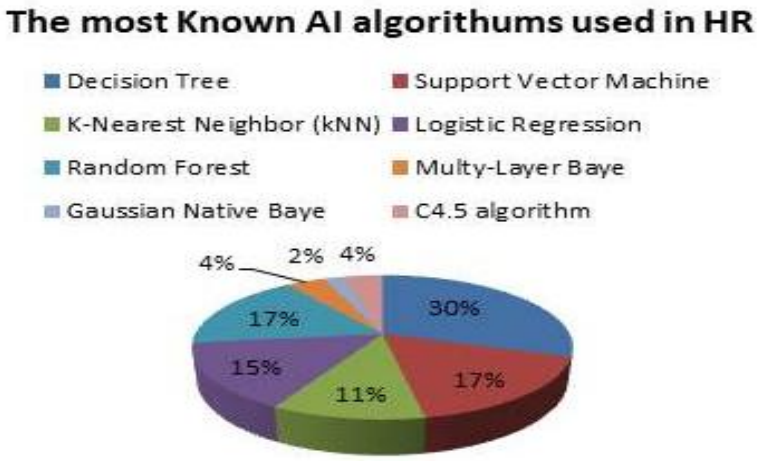
The study states that IT based solutions related papers for Human resource development has been published to the maximum, followed by skill management, recruitment, turnover and attrition.

IT solutions for HR based issues:

These research papers have provided a variety of IT solutions for HR issues which is provided as a chart below:

Source: (Berhil et al., 2020)

The above chart states that 41% of these papers provide AI as the most viable option for HR related issues which can be implemented. The study also provides various AI based solutions for HR related issues which is given as a chart below:



Source: (Berhil et al., 2020)

The various AI based algorithms which are widely used are decision tree, random forest, support vector machine, logistic regression, multi-layer perception & Gaussian Naïve baye which can be implemented across organizations. This study clearly states the various AI based applications which can be used in organizations all over the world.

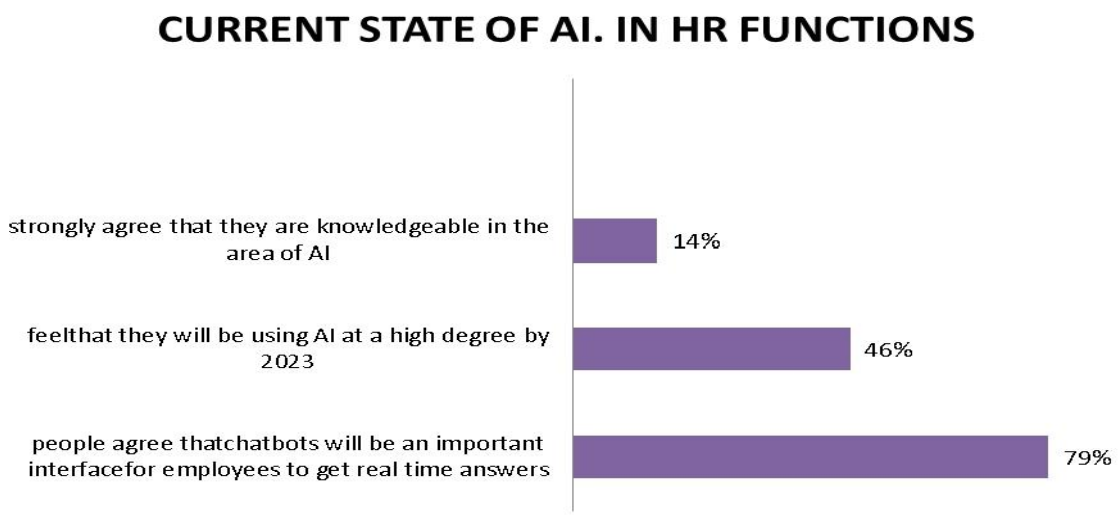
(Panda) had done a research on future transformations in HR industry due to AI and its applications. The study was conducted to know the changes and impact of AI on prevailing HR practices and management.

In this study both primary and secondary data was collected and analysed. The study concludes that AI is an effective tool which ensures more productivity and performance of employees.

The various AI based HR solutions for various HR activities are given below:

- Job sourcing (for example, Textio);
- Interviewing (myInterview);
- On-boarding (Talla);
- Coaching and training (Saberr) ;
- Employee service centres (ServiceNow).

The various AI related services which are given for HR functions are presented as a chart below:

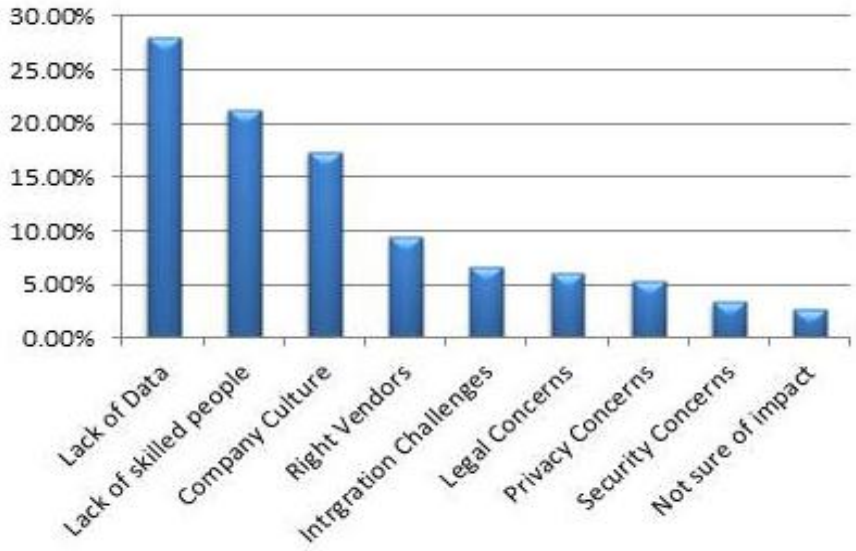


Source: (Panda)

The data provided by HR professionals above clearly state that they are aware of the various functions of AI and its applications in HR functions. The study also states that HR managers feel that AI would have a dominant presence till 2023. They also felt that it can provide an effective interface for employees to get feedback on HR functions.

Limitations of AI in Indian organizations

The study has also provided the various limitations as visualised by HR professionals which are given below;



In Indian organizations, lack of data seem to be the major limitation as organizations must keep online records of employees and performances which would enhance better analysis and decision making. There is also a definitive lack of skilled people who can be cross functional and contribute meaningfully on these AI emerging technologies and provide organizational integrations. There is a need for effective establishment of company culture which could foster these processes effectively.

There is a definitive need for right vendors who could provide right solutions at an effective price to these organizations.

There is a need for effectively integrating AI technologies and HRM practices which can ensure organizational efficiency and effectiveness. There are privacy and security issues as well which has to be catered while implementing AI technologies in Indian context.

Conclusion

From out research on the two aspects i.e. Human Resources and Artificial Intelligence, we have seen the different issues raised by the experts and the managers of the domain and to target the most posed problems, and We concluded from the number of articles found that several HR Analytics were proposed and most of them used artificial intelligence algorithms and methods, which shows the rapid and observed development and the increased interest and competition in applying this technology in HR field. The most HR issues asked were about analyzing and predicting: Recruitment, Skills Management, Human Resources Development (employees talents, effectiveness, productivity and performance), attritions and turnover. Proposed solutions were concerning known technologies like Business Intelligence, Big Data, Data Mining & Data Warehouse, some known software, frameworks and ERP (SAP, SPSS, Oracle, SAS, CRM, SMA, SNW) and Artificial Intelligence algorithms(Machine Learning, Neural Network, Deep Learning…), others used or proposed other analysis methods and simple statistics combined with HR analysis and HR approaches. The most Artificial Intelligence algorithms known used were: Decision Tree (DT), Random Forest (RF), Support Vector Machine (SVM), Multi-Layer Perceptron (MLP), K-Nearest Neighbor (KNN), Gaussian Naïve Bayes (GNB), Logistic Regression (LR), C4.5. The field of Human Resources is vast and constantly developing. The concern of each company is the management of its Human Resources by considering human capital the source of development and the pillar of success to increase productivity, attract talent and the customers in order to well cope with the competition. On the other hand, the field of intelligence is always evolving and new approaches and methods are always proposed.

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A STUDY ON ERROR ANALYSIS BASED ON LINGUISTIC INADEQUACIES AMONG THE STUDENTS OF I YEAR ENGINEERING

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ABSTRACT

Interestingly, the design of research in Andhra Pradesh comes from shifted foundations. The colleges in Andhra Pradesh are presently drawing attention in research from different provinces of India and abroad. The social and phonetic variety and the provincial metropolitan separation represent an extraordinary test for the educational program engineers and the rehearsing instructors. English is the guidance mechanism in expert training; however, language capability is not a determining rule in any designing school. The fitness is evaluated simply by the information level of essential sciences through an administration-led standard test, EAMCET (Engineering, Agriculture, and Medicine Common Entrance Test). Researchers who acquire admission to designing courses ought to have finished the higher auxiliary assessment or its same.The researcher presented the collected data in tables and statistical presentations, such as charts and graphs. The discussion includes errors in grammar and mechanics in the project reports drafted by B.Tech students. The errors were categorized into different segments of grammar and mechanics such as Articles, Verb Forms, Prepositions, Punctuation, Capitalization, Spelling, Lexical errors, and Typographic conventions. The researcher intends this study to find the most committed and least committed errors by B.Tech students from five different disciplines.

***Keywords**: Error analysis, Categorised errors, Linguistic Inadequacies*

1. Introduction

In India's tertiary education system, testing has become increasingly important in the last few decades. However, there is a gap in English language instruction and assessment right now. Implementation of testing practices has not been proved to be profitable enough [7]. As a result, assurances about the quality of teaching have become more critical than assurances about learning quality. Research is done to improve tertiary-level LSRW (Listening. Speaking. Reading. Writing.) skills. However, just a few papers are available on the Testing areas (i.e., on tests and the examination on which the real focus has to be made). The comment stated by Vedanayagam (1988) depicts the necessity of guiding tertiary-level teachers to work towards quality and excellence in teaching. Using a few examples from education policies and advancements, he illustrates how important it is to balance the requirements of instructors and students [9].

In India's education sector, quality, and competence in teaching at the higher education level have been prioritized over pedagogical skills and an awareness of students' needs, particularly in the previous decade. There were no efforts made to assist teachers in honing their scientific teaching methods. To help promote the plan to train college and university instructors in pedagogical abilities, the Ministry of Education released two policies in 1986: the National Education Policy and the Programme of Action. These policies provided the much-needed impetus for the promotion of the plan [10-18]. According to these views, it is essential to produce valuable educational and reference materials to benefit tertiary-level teachers.

Testing must be given significant prominence in teaching and learning after the secondary level because of the more pedagogically influencing students' obligations. Generally speaking, when it comes to standardized testing, teachers favor examinations over tests. In some circumstances, class tests are entirely disregarded. Moreover, the value of examinations is scarcely linked and realized with the procedure of testing. A test's overall quality is determined by the testing it undergoes. Testing the English language includes the content and the understanding of the language and grammar, and other necessary abilities [19-25]. As a result, teachers face a significant obstacle in the following testing as an academic practice. Teachers ensure that the course objectives are met every academic year and that their students are ready for exams. Teaching and learning have a purpose, and that purpose needs to be established now.

Since testing the English language would provide more clarity in evaluation, measurement, and instruction, it is necessary to prioritize it. A test or examination is used to extract knowledge at the tertiary level [26]. There are still ambiguities in the testing community about resolving challenges that arise in their day-to-day teaching, assessment, skill testing, and feedback. In the field of testing, there is no clear picture of the advantages and drawbacks of education. Resolving all of these concerns would necessitate placing a significant emphasis on testing at the postsecondary level, as Vedanayagam underlines.

Therefore, evaluation in the official educational system has evolved from the conventional examination system, emphasizing measuring students' success of a wide range of learning objectives included in their curriculum as opposed to just their subject-matter understanding alone. Therefore, different evaluation approaches (such as observation, interview, projection, and sociometry), evaluation tools (such as tests of achievement and attitude, questionnaires and rating scales, and inventories, should be employed to this end.

2. Background

Four hundred years of colonial rule had wrought enormous changes in the Indian subcontinent's social fabric. While history can recall foreign rulers exploiting the independent nation, resulting in utter poverty, a few good things were left behind when they left. The first is the language. Exposure to the colonial rulers' languages, namely Portuguese, French, and English, was advantageous to the Westward mobile Indian after independence. Many changes have occurred in the political and social arenas since independence [70]. However, the primacy of the English language has always been perceived as a critical need. There were times when people spoke out against the continuation of English. Hindi was promoted as the country's official language. Indian languages evolved, contrary to Macaulay's belief. However, English remained the dominant medium of instruction in academic institutions, at least as a second language, as the educated elite and ruling class's language of the judiciary, and as the language of the globe-trotting youth.

The English language has evolved into a truly global language. In the political and economic scene, the rise of the English peaking nations, England and the United States confer superiority on the English. The internet and email, which have revolutionized the way men live and communicate, originated in English-speaking countries. The shift has occurred. Many languages are on the verge of extinction, while English is growing in popularity.

The shift is felt and understood in India. The benefits of two centuries of English learning have enabled Indians to compete in a technologically driven world and seize more job opportunities worldwide [71-76]. With the English language he had inherited, the young globe-trotting Indian fortune seeker in the software era had an advantage over his competitors.

The realization of the importance of English has resulted in an enormous demand for English teachers worldwide. China, the former iron country, has opened its doors to English learning; the Chinese rulers realized that to feed millions of its people, they needed to "export or perish," so its citizens had to travel all over the world selling their products and services. Therefore, the Chinese government has set goals for its students to learn English beginning in kindergarten. Similarly, a large population of people in India want to improve their English skills; they want to provide quality language learning to their children. Learners set goals for themselves by requesting them.

They must be fluent in English to a high level of precision and familiarity. Job providers, too, expect their employees to be fluent in the English language. In this day and age, proficiency in English is required for advancement and advancement in various fields of work [77]. As a result, the goal of studying English has shifted. Unfortunately, English teaching and learning methods have remained unchanged, outdated, and obsolete. Teachers are not kept up to date on newer methods of English language teaching that are being used around the world.

Teaching methods have not progressed from traditional methods such as Grammar

Translation (GT) to Communicative Language Teaching (CLT). Acceptance to LSRW (Listening, Speaking, Reading, and writing) is emphasized on multiple platforms but is not practiced in classrooms. Listening and speaking are considered necessary skills, whereas reading and writing are considered advanced skills. Students are not exposed to English sounds and are only familiar with English letters [78]. Because there is no one-to-one correspondence between English sounds and letters (as in most Indian languages), the learner makes mistakes when speaking and writing in English. A student, for example, will make mistakes in the use of articles unless he is familiar with the English sounds.

3. Methodology

3.1 Selection of Specific Skills

Among the 21 soft skills referenced in scientific journals, the researcher strongly recommends them for engineering students in this study. Essential abilities among the 21 listed here include the capacity to speak and write clearly and effectively with others, as well as the ability to work well in a team and under pressure. Other than this, the researcher has sought advice from Human Resources (HR) executives at international corporations to choose which talent should be tested. Because of this, the following abilities were selected for this study:

Table 1 Selected skills for the study

S. No	Sub-Skill	Under the grp
1	Decision making	Intrapersonal skills
2	Time management	
3	Knowing self	
4	Stress management	
5	Problem-solving	
6	Goal setting	
7	Communication Skills	Interpersonal skills
8	Teamwork Skills	
9	Leadership Skills	
10	Management Skills	
11	Presentation Skills	
12	Listening Skills	Verbal skills
13	Reading Skills	
14	Speaking Skills	
15	Writing Skills	
16	Voice Modulation	
17	Importance of body language	Non-verbal skills
18	Eye contact	
19	Facial expressions	
20	Gestures	
21	Posture	

3.2 Sample Collection

I B. Tech students from various engineering and technology fields were asked to participate in the study, which gathered 410 students from five different engineering disciplines: civil, mechanical, computer science, electrical, and electronics. Purposive sampling is used to gather the models from Andhra Pradesh's engineering schools. You may see the results in the following table from various colleges.

Table 2 Information on samples gathered from colleges on the list

S. No	**Location of the College**	**Branch**	**Samples Collected**
1	Engineering college from Kadapa	ECE	63
		CEC	67
2	Engineering college from Ananthapur	ECE	49
		Mechanical	50
3	Engineering college from East Godavari	Civil	65
4	Engineering college from Medak	EEE	60
5	Engineering college from Khammam	Mechanical	56
		Total	410

The researcher chose factors like rural and urban, male and female, and branches like Civil, EEE, Mechanical, ECE, and CSE as independent variables to study. There were 2,176 students from rural backgrounds who attended campus interviews, according to the study. Only 20% of the pupils were accepted out of the 80% that were rejected. Due to their poor performance in class discussions and

individual interviews, the majority of rural students were expelled [147].

As part of employability training, over 75% of rural graduates who had received soft skill training related to computer foundations showed high levels of satisfaction, according to the study Still, they expressed unhappiness with English-related soft-skills training. Rural grads, according to many respondents, were unable to consistently practise their English speaking and writing because of a lack of resources. At the elementary school level, they would also need new approaches to teaching English as a second language (ESL). It's critical that rural pupils' soft-skills levels are examined.

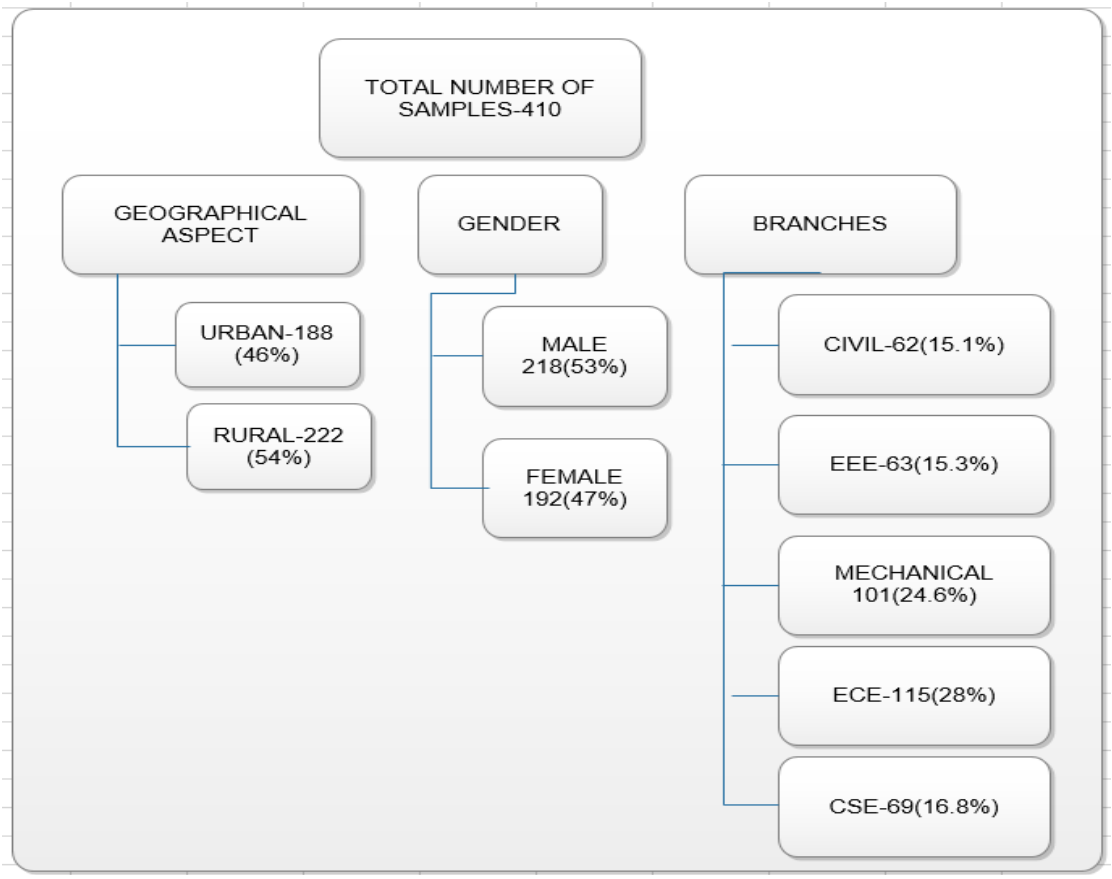

Figure 1: Total number of samples collected from the different types

Rural pupils, on the other hand, have difficulty mastering communication skills because of their apprehensions. While connecting with the lecturers, urban students took use of the classroom. Rural pupils are more afraid since they don't have the support they need to succeed. In order to communicate effectively in English, rural students often have difficulty expressing themselves. They tend to make grammatical errors in English since they only speak and think in their own tongue. As a result, students in rural areas prefer to learn in groups where they may more easily clarify their doubts.

4. Error Analysis

The researcher presented the collected data in tables and statistical presentations, such as charts and graphs. The discussion includes errors in grammar and mechanics in the project reports drafted by B.Tech students. The errors were categorized into different segments of grammar and mechanics such as Articles, Verb Forms, Prepositions, Punctuation, Capitalization, Spelling, Lexical errors, and Typographic conventions. The researcher intends this study to find the most committed and least committed errors by B.Tech students from five different disciplines.

According to Selinker, the use of the simple present instead of any other tense is the result of a tendency for simplification, “strategy of second language learning”, for learners of English avoid producing “grammatical formatives” such as “the past tense forms”. In

this regards, it is also observed that the students simple structure such as using the present simple tense instead of the form "would like" or using the simple past tense instead of the present perfect tense. Thus, the students tend to use the simple form structures such as simple present or simple past. Wyatt works out that 2.5% of committed errors in tenses related to the use of present simple in a past context or using the past simple in a present context.

Ellis tries to distinguish between errors and mistake. Spelling errors are consistent the same misspellings that learners consistently make because they do not know that it is incorrect. Spelling mistakes are lapses that learners misspell some words that they most of the time spell correctly. However, he concludes "a clear distinction between an error and a mistake may not be possible."

This segment of the presentation of the data explains the errors as per their category, respectively. The errors obtained thought the analysis of 100 samples were categorized into eight major classifications, such as errors in the usage of articles, lexical, verb forms, prepositions, spelling, conventional typography, punctuation errors and capitalization, respectively. The sample of errors that occurred in each category was presented in a table with correct usage to the error is presented in this segment.

4.1 Usage Article errors

Using articles correctly is one of the biggest challenges faced by ESL/EFL learners, and this becomes huge trouble for them, especially when they draft a document. The table following shows the samples of article errors obtained from various sample reports taken for the study. The significant errors in the usage of articles are the addition and omission of articles. When used in the places not needed, articles are termed as the addition of articles, and missing articles in the areas where they are required are the omission of articles. The sample errors shown in this table below show that the students who drafted these documents were not clear about the usage of articles. Therefore, their written paper is an exhibit of their inadequate knowledge in the use of articles.

Table 3: Article errors with examples from the samples

Sl.No	Errors	Error	Source	Correction
1	To keep a check on the water content in soil	Missing article	Computer Science Engineering Sample 1	in the soil
2	to measure humidity content of the soil…	Missing article	Computer Science Engineering Sample 3	the humidity
3	The previous 'n' time steps from current time...	Missing article	Computer Science Engineering Sample 7	the current
4	The project requires detailed and customized administrative system for managing	Missing article	Information Tech Sample 3	a detailed
5	advanced solution to integrating the all school processes.	Unnecessary use of article	Information Tech Sample 3	all school processes.

This table indicates the different kinds of errors in using articles committed by the students who have drafted the project reports. Article errors are in number one position in the chart of errors committed by the students; one thousand seven hundred and six article errors were recorded out of the overall five thousand and eighty errors obtained from one hundred samples.

4.2 Lexical errors

Lexical errors are frequently misused words irrelevant to the context. This form of error is the result of inadequate vocabulary. When they try to write, the learners make errors by their choice of words that lead to clumsiness and ambiguity in their writing, including using too many words to express a thought instead of putting it straight in a single word. This

wordiness makes the readers lose interest in the document.

Zhang says, "mistakes in lexical selection may be less generously tolerated outside classrooms than mistakes in syntax'. It is probably because lexical selection consists mainly of content words, which convey the intended message. Therefore, wrong linguistic choices (lexical errors) will lead to a misunderstanding of the message directly, or at least to an increase in the burden of interpreting the text."

Table 4: Lexical errors with examples from the samples

Sl.No	Errors	Error	Source	Correction
1	we are able to incorporate this system	Wordiness	Computer Science Engineering Sample 1	Can
2	In order to place the order,	Wordiness	Computer Science Engineering Sample 3	To place the order
3	There are a number of considerations	Wordiness	Computer Science Engineering Sample 7	Several/Some/Many
4	In this result is shown on the basis of selected category.	Wordiness	Computer Science Engineering Sample 11	based on
5	the admin chooses if he really wants to cancel the ticket.	Unnecessary usage	Computer Science Engineering Sample 15	the admin chooses if he wants to cancel the ticket.

The table is the representation of the lexical errors taken from the sample for the study. Even though lexical errors are recorded, they hold the last position as per the occurrences, with just 67 out of 5080 errors in total. Thus, lexical errors are just one percent of the big picture.

4.3 Usage of Verb form Errors

Usage of the verb forms is the backbone for writing. It is, however, essential to understanding that the misconception of being non-serious to the grammatical rules and making mistakes in using verb forms while drafting damages the script. When it comes to technical writing, consistency is essential, and correctness in the usage of verb forms ensures consistency in writing.

Lee says, "To describe the nuances of an action, a verb may be associated with various concepts such as tense, aspect, voice, mood, person, and the number." So, one cannot say that verb tense errors are just one type of grammatical errors. Instead, verb form errors are the errors that affect a written document in many factors like tense, aspect, voice, mood, person, and number.

Table 5: Verb form errors with examples from the samples

Sl.No	Errors	Error	Source	Correction
1	Vidyalaya is fully integrated school solution with various support	Wrong use of verb	Information Tech Sample 3	has
2	The use of a communications plan to ensure appropriate communications between	Singular verb used	Information Tech Sample 3	plans
3	The two images are showing the user home page after logged in	Wrong use of verb	Computer Science Engineering Sample 6	logging in
4	The establishment and maintenance of such platforms needs to be affordable.	Subject Verb	Computer Science Engineering Sample 7	platforms need
5	But none of them offer any immediate contacts.	Subject Verb	Computer Science Engineering Sample 1	offers

The table above gives a precise picture of the different verb errors that appeared in the samples taken for the study. The researcher identified four hundred errors in the usage of verb forms, which forms a decent share in the overall 5080 errors from the 100 sample papers.

4.4 Errors in the usage of Prepositions

Preposition plays a vital role in conveying meaning to the readers. Errors in prepositions would look odd in technical writing because prepositions are a fundamental part of English grammar. However, because of its complexity, the users often make mistakes in the usage of the preposition.

The table below shows how engineering graduates made errors in the usage of prepositions. Two types of errors appeared in the samples. One is the misuse of prepositions, and the other is the omission of prepositions. Misuse of prepositions seemed more compared to omission errors.

Table 6: Prepostion errors with examples from the samples

Sl.No	Errors	Error	Source	Correction
1	could decide to monitoring of activities to the project manager	Unnecessary use ofpreposition	Information Tech Sample 3	monitoring activities
2	provide login account for user and forNGO management.	Unnecessary use of preposition	Computer Science Engineering Sample 6	NGO management
3	It will contain a form collecting patient data	Missing preposition	Computer Science Engineering Sample 1	a form of
4	We also aim to provide customers a better interface for their best use.	Missing preposition	Computer Science Engineering Sample 7	customers with a
5	Step 3.5 : Review overall resource	Missing preposition	Information Tech Sample 5	Step 3.5 : Review of overall resource

The table above shows how prepositions are misused, overused, and omitted in the technical writing attempted by engineering undergraduate students. The preposition errors produced by the technical undergraduates are comparatively lesser than the big picture. The preposition errors hold a very minimum percentage in the occurrences when compared to other errors.

4.5 Spelling Errors

Errors in spelling make any written document odd and unprofessional. The repeated occurrence of the same spelling error shows the insufficient vocabulary skills of a writer. Spelling errors are caused mainly because of the lack of reading with the writer who attempts technical writing. Leacock and Claudia stated, “Among the grammatical errors made by writers, spelling error occupies the most prominent position, no matter in the writers of native speakers or language learners.”

The table below shows different spelling errors from the sample taken for the study. Spelling errors hold one of the significant shares from the overall errors. There were 714 spelling errors from the prevalent 5080 errors, which is a considerable share.

Table 7: Spelling errors with examples from the samples

Sl.No	Errors	Error	Source	Correction
1	Biometirc, Smartcard, Barcode etc.	Spelling	Information Tech Sample 3	Biometric
2	Identify and quantity risks for activities	Spelling	Information Tech Sample 3	Quantify
3	Hyper Text Markup Language (HTML)	Spelling	Computer Science Engineering Sample 6	Hypertext
4	and the self help chat bot.	Spelling	Computer Science Engineering Sample 7	chatbot.
5	used to control user-access	Hyphen usage	Computer Science Engineering Sample 1	user access

The table above shows different types of spelling errors by the engineering graduates while preparing their project reports. Many of the errors are from essential English words like develop and accommodation. This sample is evident to show that engineering undergraduates require practice in reading.

4.6 Conventional Typographic errors

Typographic mistakes are familiar to everyone while writing a document. But, that becomes an error when the same typographic errors appear again and again in a piece of writing. The researcher came across many such repeated occurrences of typographic mistakes while reading the sample for the study. The predominant typographic error committed by this target group is improper spacing in the document.

Formatting the document is a critical skill in technical writing. Spacing is one crucial aspect in formatting a document, and repeated errors in spacing show the skill deficiency among technical graduates in writing and editing a technical paper. The table below shows various typographic errors from the sample.

Table 8: Typographic errors with examples from the samples

Sl.No	Errors	Error	Source	Correction
1	current state-of-the-art systems for water and irrigation management are…	Space between Words	Computer Science Engineering Sample 1	irrigation management
2	gardens would next needwater…	Space between Words	Computer Science Engineering Sample 3	need water
3	use and rights management.It also manages to provide announcements and	Space after period	Information Tech Sample 3	management. It
4	home page after logged in.	Double space	Computer Science Engineering Sample 6	after logged in
5	suggestions thathelped me to complete	Space between Words	Computer Science Engineering Sample 7	that helped

Managing space at various places was difficult for the technical students, which is evident from the sample above. But, to the surprise, the research identified that conventional typographic errors were the second most committed error by the target group with 1095 errors out of overall 5080 errors.

4.7 Usage of Punctuation errors

Using punctuation in writing is one of the most challenging parts for many. Punctuations errors are pretty common even in the reports of language experts. Misuse of punctuations and omission of punctuations are the two significant errors committed by the engineering students. Punctuation is an essential component in written English because they are used in all forms of writing and, most importantly, technical writing. Misuse of punctuation can change the entire meaning of a statement.

The table below shows the different punctuation errors from the sample of the study. Engineering undergraduate students showed insufficient knowledge in punctuation usage, and it is evident from 866 punctuation errors out of overall 5080 errors.

Table 9: Punctuation Errors with example from the sample

SL.NO	Errors	Error	Source	Correction
1	A Three point running average…	Hyphenated Word	Computer science Engineering Sample 1	Three-point
2	It is necessary to make provisional plans for the more distant tasks,because thinking about what needs to be done….	Remove Comma	Information Tech sample 3	Tasks because
3	Date:29th October,2018	Remove Comma	Computer science Engineering sample 6	October 2018
4	IEEE std 830-1984,vol., no.,pp.1-26,Feb.10 1984	Add comma	Computer science Engineering sample 7	Feb.10,1984
5	Also our booking system has discount for various age ranges.	Add comma	Computer science Engineering sample 15	Also,our booking system has discount for various age ranges.

Misuse of punctuations and omission of punctuations were found in almost all the documents taken for the sample.

4.8 Capitalization errors

Errors in capitalization spoil any technical document. Capitalization is one of the fundamental language aspects taught in schools to kids. In that sense, errors in capitalization errors are unacceptable in technical documents like project reports. The table following shows the capitalization errors made by the target group.

Table 10: Capitalization errors with examples from the samples

Sl.No	Errors	Error	Source	Correction
1	Figure 8: front Page of Training Management system 15	Missing Capitalization	Computer Science Engineering 11	Front Page
2	[1] A.K malhotra, Hospital management system	Missing Capitalization	Computer Science Engineering 7	[1] A.K Malhotra
3	We used html for the creation of pages and registration form.	Missing Capitalization	Computer Science Engineering 15	HTML for
4	The project Manager will be considered	Missing Capitalization	Information Tech Sample 3	The Project Manager will be considered
5	2nd april	Missing Capitalization	Information Tech Sample 7	2nd April
6	Interfacing MQ5 sensor to Arduino:	Missing Capitalization	Electrical Engineering Sample 7	Sensor to Arduino

There was the least number of errors in capitalization found from the sample taken for study. This shows that technical graduates are good enough to create basic sentences with proper capitalization wherever necessary. There were only 102 capitalization errors found out of 5080 overall errors.

5. Analysis and Discussion

This chapter presents a comprehensive picture of the errors from the 100 sample project reports taken for the study—the errors from each piece recorded and classified into eight major categories. Out of eight different error categories, article errors are the most occurred errors, with 1706 occurrences in the 100 reports taken for observation. The second most repeated errors come from a nongrammatical error category. Typographic errors, classified as mechanics errors, top double in the list with 1095 occurrences.

These young technical graduates exhibited difficulty in using punctuation. Using punctuations is comparatively difficult than the

rest of the errors, which is evident from the sample taken for this study. Eight hundred sixty-six occurrences of punctuation errors make it the third most occurred error in the list. Spelling is yet another problematic area for these engineering students, and these errors are in the position next to punctuation errors with 714 occurrences.

Improper verb forms usage at the initial stages of language learning can be acceptable, but it is not while doing a professional degree course. The inappropriate use of verb forms was present in many reports taken for the study, and the researcher recorded 400 errors from the 100 papers accepted for investigation. Errors in the usage of prepositions, capitalization errors, and lexical errors come next in the list, respectively. Even though the researcher recorded these three errors, their numbers are minimal as 130, 102, and 67, respectively. The table below shows a summary of the errors obtained from the 100 student project reports.

Table 11: Summary of errors

Branch	Articles	Prepositions	Verb Forms	Punctuations	Lexical errors	Spelling Errors	Capitalization	Typographic Conventions	Total
Electrical Engineering	180	13	39	54	3	66	37	143	535
Electronics Engineering	226	19	51	140	4	35	3	162	640
Mechanical Engineering	418	27	92	200	10	113	15	195	1070
Information Technology	494	42	94	287	22	285	27	500	1751
Computer Science and Engineering	388	29	124	185	28	215	20	95	1084
Total	1706	130	400	866	67	714	102	1095	5080

Table 12: Error Analysis Based on the Different Types of Errors

S. No	Error Name	Percentage
1	Article errors	34
2	Lexical errors	1
3	verb form errors	7
4	preposition errors	2
5	Spelling errors	12
6	Typographic errors	18
7	punctuation errors	15
8	Other Errors	12

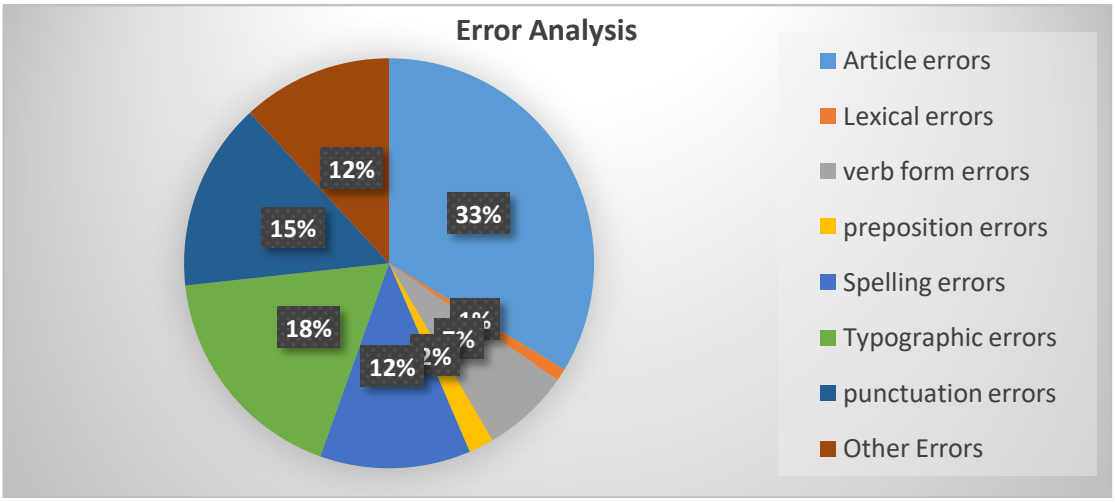

Figure 2: Error Analysis

6. Conclusion

There is a greater demand for soft skills as a result of the rapid advancements in technology, the proliferation of international corporations, contact centres and economic liberalisation. At employment, soft skills are crucial. The development of students' soft skills necessitates the development of their moral and aesthetic sensibilities, as well as their communication abilities. It is the study's primary goal to investigate the effect of imparting soft skills to engineering students. The research also looks at how Andhra Pradesh's educational techniques and materials affect the development or lack thereof of soft skills. Discussions about the importance of developing soft skills and how to collect and analyse data were part of the study.

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USING THE UREA FUEL COMBUSTION METHOD, STRUCTURAL, MORPHOLOGICAL, AND PHOTOLUMINESCENCE INVESTIGATIONS OF $SRAL_2O_4:EU^{2+}$ NANOPHOSPHOR

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ABSTRACT

In the present work deals withEu^{2+} doped $Sr_{1-x}Al_2O_{4:x}Eu$ (x= 0.01) phosphor (SAE 0.01 phosphor) with very high brightness and lengthy after glow was manufactured at 580 ^oC temperature using the urea fuel combustion method.After a structural examination employing X-ray diffraction, the sample was confirmed to be single phased in nature and to have crystallised into monoclinic phase with typical JCPDF 34-379 card. The oxide production was investigated using the FTIR technique. Using transmission electron microscopy (TEM), the average size was observed to be around 4- 21 nm. The photoluminescence research found that it exhibits broad emission spectra with an excitation wavelength of 365 nm. At a colour temperature of 8645 K, Eu^{2+} doped $Sr_{1-x}Al_2O_{4:x}Eu$ (x= 0.01) phosphor (SAE 0.01 phosphor) may be regulated to emit blue (0.27, 0.35) light. The spectra are definitely extremely bright and visible.

Keywords- *Combustion method, Nanophosphor, photoluminescence, Blue emission, CIE chromacity.*

Introduction

The use of phosphor materials as a cost-effective source of energy with long-term durability is increasing on a global scale. The US Department of Energy (DOE) recently said that light-emitting diodes (LEDs) are proposed to reduce light energy use by 15% by 2020 and 40% by 2030, generating 3.0 quads in 2030 alone, resulting in an energy consumption savings of roughly $26 billion [1-2]. As a result, carbon dioxide (greenhouse gas) emissions would be reduced by almost 180 million metric tonnes. According to DOE [3,] the discarded means of lighting our planet, from incandescent light bulbs to overhead fluorescent tubes, may go the way of the oil lamp in the next ten years.Phosphors converted white light-emitting diodes and other light-emitting diodes could be used in future lighting devices and considered as excellent materials for solid lighting technology in comparison to older light sources because of their inherent characteristics, such as low energy consumption, long life, high chemical stability, and ecofriendliness [4].

Due to their exceptional luminous qualities, rare earth and alkaline earth aluminate phosphorescent materials have a wide range of applications in solid-state lighting, display components, and other fields. Alkaline earth aluminates are chemically durable in a wide range of conditions and are employed as ideal host materials in current luminescence-based devices[5]. The composition of the host lattice determines the luminescence, which can occur anywhere in the electromagnetic spectrum from ultraviolet to infrared. The photoluminescence of rare-earth-doped alkaline earth aluminates, MAl_2O_4 (M = Ca, Sr, Ba), demonstrates the property of long-lived luminescence[6-7]. The long-afterglow property of alkaline earth aluminate phosphors doped with rare earth has gotten a lot of attention because of its potential uses. Strontium aluminates, especially $SrAl_2O_4$, have been extensively researched for current uses such as hydraulic binders[8-10], long-afterglow phosphors,[11-13], mechanoluminescent pigments[14-16], and catalysts[17]. By doping with rare earth ions, SrAl2O4 is one of the most extensively utilised host lattices for generating luminous pigments with high intensity and long decay time[13,18-20]. The dopant determines the colour of the emitted light, which can be yellow-green, green-blue, or even blue-purple[19]. However, The sensitivity of $SrAl_2O_4$ to water (hydraulic activity) significantly restricts its pigment-based applications.

$SrAl_2O_4$ is mostly made through a solid-state process, which necessitates annealing at high temperatures, usually above 1000°C, for extended periods of time, ranging from several hours to days, to cause grain development and particle sintering[21-22].

The sol–gel method [23-24], crystallisation of spray-dried amorphous precursors [25],

precipitation [26], flame spray-pyrolysis [27], and certain other synthesis methods have been reported in the literature.

Combustion synthesisis a rapid and energy-efficient alternative for preparing $SrAl_2O_4$ [28-29], and it has lately attracted the attention of researchers due to its several advantages over traditional approaches [30-31]. An exothermic redox reaction between metal nitrates and an organic fuel is typically used in combustion synthesis. The raw material solution is heated to a low temperature, and once ignited, the combustion process evolves in a self-propagating way to produce the desired chemical.

The nano-scale phosphor preparation is motivated by the discussion. A urea fuel combustion method was used to produce nanocrystalline powder of Eu^{2+} doped $Sr_{1-x}Al_2O_{4:\,x}Eu$ (x= 0.01) phosphor (SAE 0.01 phosphor) in the current work. The structural, morphological, and luminescent properties of the phosphor sample were investigated.

Experimental details-

The urea fuel combustion technique was used to make Eu^{2+} doped $Sr_{1-x}Al_2O_{4:\,x}Eu$ (x= 0.01) phosphor (SAE 0.01 phosphor). Nitrates like Strontium nitrate [$Sr(NO_3)_2$], aluminium nitrate [$Al(NO_3).H_2O$], oxides such europium oxide [Eu_2O_3], and Urea [$CO(NH_2)_2$] were used as starting ingredients in the production technique. By dissolving the Europium oxides in 2 mL of concentrated HNO_3, they were transformed to nitrates.

$$Eu_2O_3 + 6HNO_3 \rightarrow 2Eu(NO_3)_3 + 3H_2O$$

The stoichiometric quantities of the initial components were combined with the urea and mashed with a mortar and pestle, yielding a paste. Using a vertical Furnace, the paste was transferred to the crucible and burnt at 580 ^oC. Within seconds, the solution catches fire and transforms into white foam (ash). It takes 5-10 minutes to complete the response. The ashes collected after the solution was burned were ground into fine nano powder using a mortar and pestle.

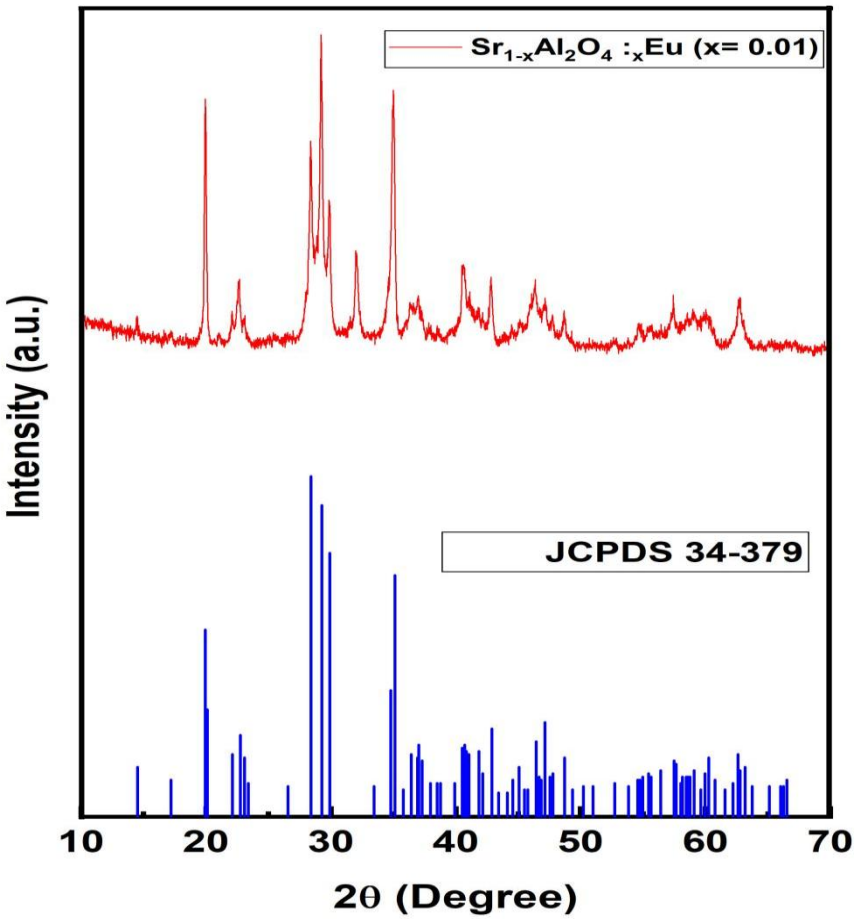
X-ray diffraction characterization of Eu^{2+} doped $Sr_{1-x}Al_2O_{4:\,x}Eu$ phosphor was performed using a Bruker D8 Advance X-ray diffractometer with CuKα (1.5406Å) radiation across the angular range 2θ (10°-70°). By combining the sample with potassium bromide (KBr) , FTIR spectra were recorded using a Bruker FTIR ALPHA II to investigate the finger print area (400–4000cm-1) and the functional group in the region (400–4000cm-1) of $SrAl_2O_4$:Eu^{2+}phosphor. The Fluoromax-4 spectroflurometer from Horiba Scientific Instruments was used to measure photo luminescence. At room temperature, all characterizations for the prepared Eu^{2+} doped $Sr_{1-x}Al_2O_{4:\,x}Eu$ (x= 0.01) phosphor (SAE 0.01 phosphor) sample were performed.

Results and discussion-

The urea fuel combustion process was used to successfully synthesise Eu^{2+}doped $Sr_{1-x}Al_2O_{4:\,x}Eu$ (x= 0.01) phosphor (SAE 0.01 phosphor). The phosphor was examined using the XRD diffraction technique for structural studies, the FTIR characterization technique for oxide formation, an electron microscope operating at 100-400 kV for morphological studies, and the PL characterization technique for luminescence investigations.

Our produced Eu^{2+}doped $Sr_{1-x}Al_2O_{4:\,x}Eu$ (x= 0.01) phosphor (SAE 0.01 phosphor) XRD data matches standard JCPDS Card 34-379 completely. The single phase nature of the produced sample was shown by the XRD data acquired in the angle range of 10^o – 70^o, as shown in Figure.1. In addition, the sample was found to have a monoclinic structure with the space group P 21/ n. The characterisation peak's intensity indicates that the sample is crystalline, however the peaks' broadness indicates that the sample has a smaller average crystalline size. The average crystalline size of prepared samples were calculated using Debye-Scherer formula $D = \frac{K\lambda}{\beta \cos\theta}$ is 13.2781nm.

Figure 1: XRD spectrum of Eu^{2+} doped $Sr_{1-x}Al_2O_{4:\,x}Eu$ (x= 0.01) phosphor (SAE 0.01 phosphor)and standard spectrum JCPDS 34-379



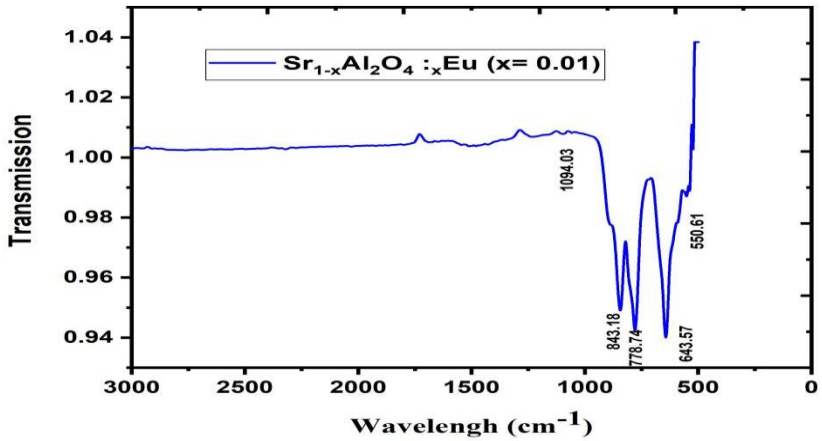


Figure 2: FTIR spectrum of Eu^{2+} doped $Sr_{1-x}Al_2O_{4:x}Eu$ (x= 0.01) phosphor (SAE 0.01 phosphor).

The Fourier transform infrared spectra were recorded in the wave-number range of 400-4000 cm-1, however only the range of 400-3000 cm-1 is shown in Figure 2 due to the absence of higher order absorption bands. The monoclinic crystal structure of SrAl2O4 is characterized by a number of absorption peaks in the 400–900 cm-1 range. The bands in the range 350-1000 cm-1 are all connected with the vibrations of Al=O, Sr=O, and Sr-O-Al bonds and may be attributed to infrared active vibration modes of $SrAl_2O_4$ phosphor. The symmetric bond of O-Al-O causes the band at 550.61 cm-1, whereas the anti-symmetric

stretching bands run from 588-845 cm-1 and are caused by Sr-O vibrations, meaning that the band at 843.18 cm-1 is likely SrO. The bands below 1000 cm-1 are generally strontium aluminate's natural active IR vibration modes. The anti-symmetric stretching bands of Sr-O vibrations in $SrAl_2O_4$ are at 643.57 cm-1, 778.74 cm-1, and 843.18 cm-132-33].

Figure4: PL Emissionspectrum ofEu^{2+} doped $Sr_{1-x}Al_2O_{4:\,x}Eu$ (x= 0.01) phosphor (SAE 0.01 phosphor).

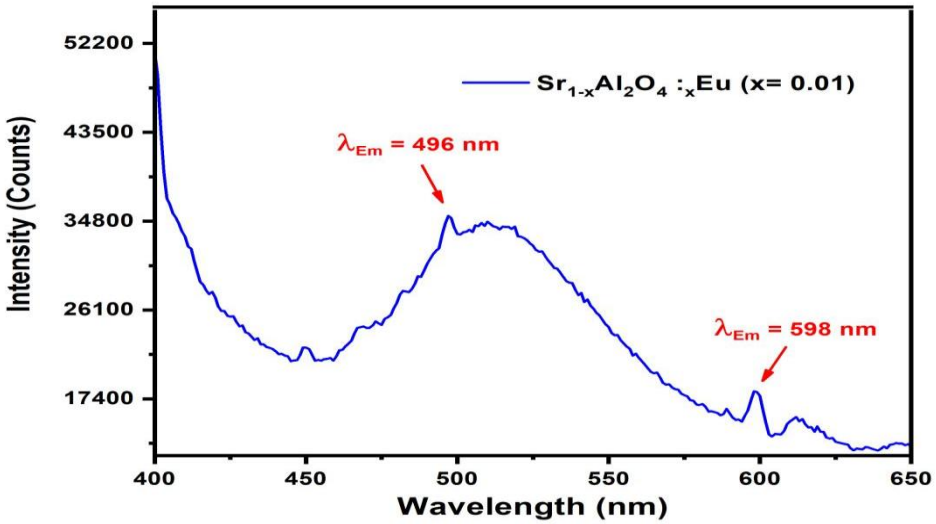


Figure 4 shows the emission spectra of Eu^{2+} doped $Sr_{1-x}Al_2O_{4:\,x}Eu$ (x= 0.01) phosphor (SAE 0.01 phosphor) generated through urea fuel combustion technique. 365nm is employed as the excitation wavelength. It has a wide band and an emision peak at 496 nm, which is attributed to the normal Eu^{2+} ion transition. There is also a tiny peak at 598 nm. It is discovered that host $SrAl_2O_4$ absorbs light in the 450-600nm region, which may be ascribed to the self absorption band of$SrAl_2O_4$as well as the f-d transition of Eu^{2+}[34].

The expatiation spectrum of Eu^{2+} doped $Sr_{1-x}Al_2O_{4:\,x}Eu$ (x= 0.01) phosphor (SAE 0.01 phosphor) is shown in Figure 5.

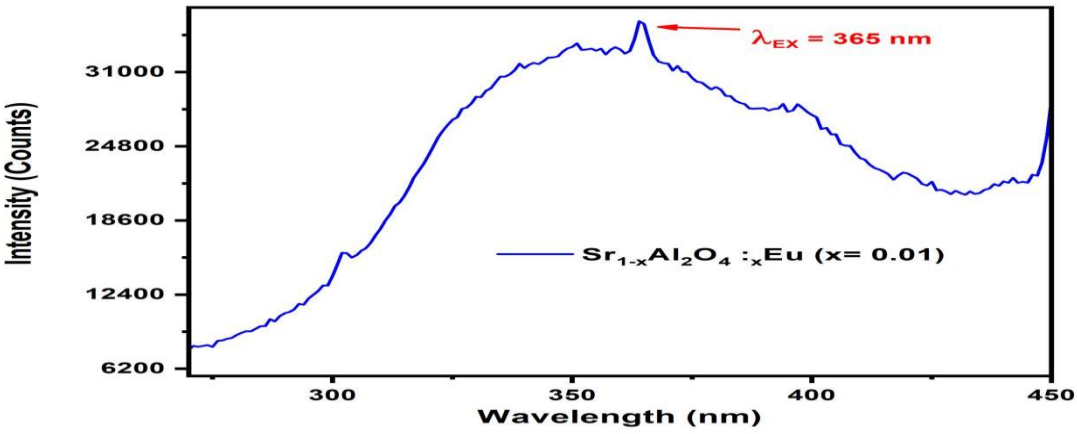


Figure5: PL excitation spectrum of Eu^{2+} doped $Sr_{1-x}Al_2O_{4:\,x}Eu$ (x= 0.01) phosphor (SAE 0.01 phosphor).

Figure 6 shows the Commission International de' LEclarirage (CIE) diagram of Eu^{2+} doped $Sr_{1-x}Al_2O_{4:\ x}Eu$ (x= 0.01) phosphor (SAE 0.01 phosphor) for visual comprehension of color tunable emission of manufactured phosphors (SAE 0.01 phosphor). The associated colour temperature (CCT) obtained by the matching emission spectrum is provided in Table below. It can be seen that the Eu^{2+} doped $Sr_{1-x}Al_2O_{4:\ x}Eu$ (x= 0.01) phosphor (SAE 0.01 phosphor) may be controlled as blue (0.27, 0.35) emission with a colour temperature of 8645 K.

S.N.	Composition	CIE Coordinate (X,Y)	CCT (K)
1	$Sr_{1-x}Al_2O_4 :\ _xEu$ (x= 0.01)	X = 0.27, Y = 0.35	8645

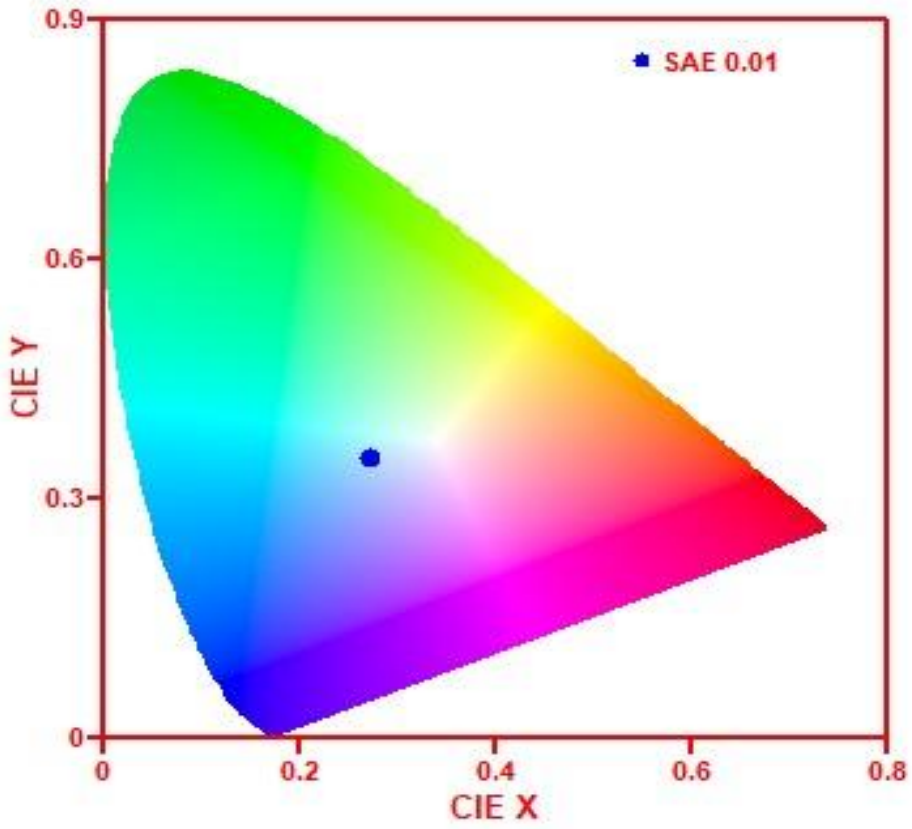
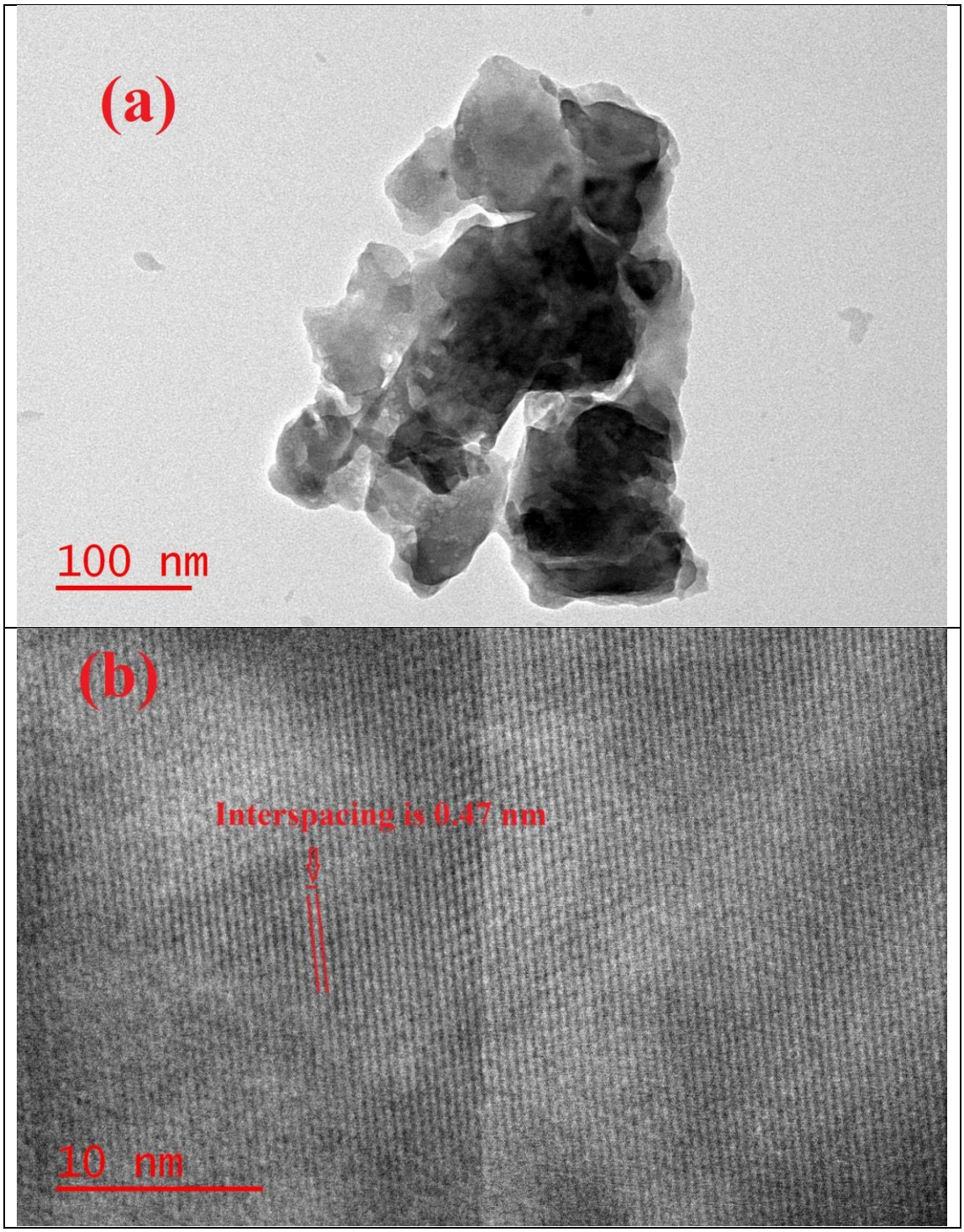


Figure6: PL CIE diagram ofEu^{2+} doped $Sr_{1-x}Al_2O_{4:\ x}Eu$ (x= 0.01) phosphor (SAE 0.01 phosphor).

The morphological analysis is carried out using a TEM-TECNAI G2 T30 (S-TWIN) electron microscope with a voltage range of 100-400 kV. Transmission electron microscopy was used to measure the particle crystal picture, HR image, and selected area electron diffraction (SAED) image. The crystal structure, particle size defect, voids, pores, and other characteristics of Eu^{2+} doped $Sr_{1-x}Al_2O_{4:\ x}Eu$ (x= 0.01) phosphor (SAE 0.01 phosphor) produced using the urea fuel combustion method are obtained. The average size was determined to be between 4 and 21 nanometre. Image J software was used to calculate the fringe width of the HRTEM image. Figure 7b shows a typical HRTEM image of a phosphor sample. Close inspection of the HRTEM image reveals that the sample has homogeneous lattice fringe with an estimated inter-spacing of 0.47 nm. The comparable SAED pattern (Figure 7c) shows discrete rings, indicating that it is a diffraction pattern from a nano phosphor assembly.


(a)
100 nm
(b)
Interspacing is 0.47 nm
10 nm

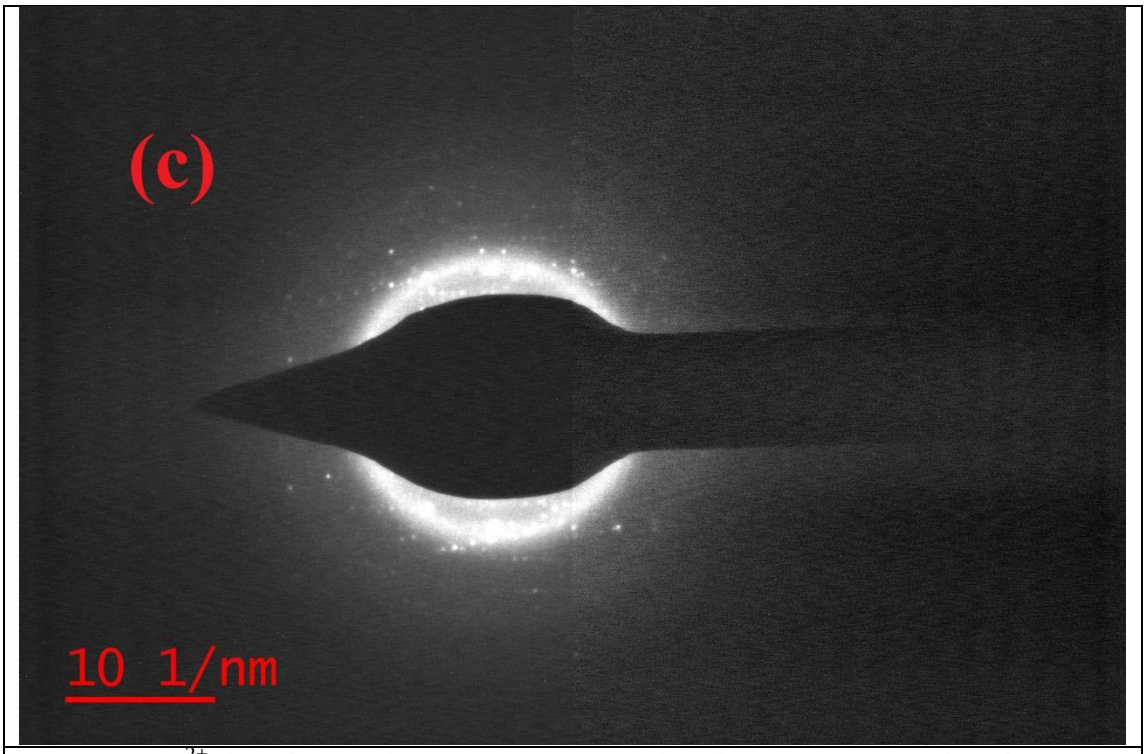


Figure7: Eu^{2+} doped $Sr_{1-x}Al_2O_{4:\ x}Eu$ (x= 0.01) phosphor (SAE 0.01 phosphor)TEM image(a) and HRTEM image(b) and SAED pattern(c)

Conclusion-

Finally, using the urea fuel combustion method, the Eu^{2+} doped $Sr_{1-x}Al_2O_{4:\ x}Eu$ (x= 0.01) phosphor (SAE 0.01 phosphor) was successfully produced. The kind of phase and crystal structure of the sample were confirmed using XRD data, which revealed that it had a single phase monoclinic structure with space group P 21/n. The FTIR method was used to investigate the oxide production. The average size was discovered to be around 4- 21 nm using transmission electron microscopy (TEM). Image J software was used to calculate the fringe width of the HRTEM image. Uniform lattice fringe with an estimated inter-spacing of 0.47 nm may be seen in a typical HRTEM image of phosphor sample. In the visible region, the PL emission spectra showed distinct glow peaks corresponding to Eu^{2+}. For blue light emitting diodes and other optoelectronic devices, the broad emission spectrum could be considered an alternate method of obtaining direct blue emission.

Conflict of Interests

The authors declare that there is no conflict of interests regarding the publication of this paper

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