

## DIGITAL TRANSFORMATION STRATEGIES FOR EMERGING TECHNOPRENEURS

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gajannanaik89@gmail.com***Abstract**

*Digital transformation has become a pivotal catalyst for competitiveness, innovation, and sustainability within contemporary entrepreneurial ecosystems. Technopreneurs—entrepreneurs who harness technology to launch and scale novel ventures—must implement robust digital-transformation strategies in order to stay ahead in fast-changing markets. This paper investigates the principal digital-transformation tactics employed by emerging technopreneurs and assesses how these tactics affect business innovation, operational efficiency, and market reach. The objective of the research is to pinpoint the technological instruments, digital platforms, and innovative practices that allow technopreneurs to convert conventional business models into technology-centric enterprises. Emphasis is placed on the adoption of cloud computing, artificial intelligence, big-data analytics, digital marketing, and e-commerce solutions. These technologies are shown to improve decision-making, boost customer interaction, and support scalable operations. Adopting a mixed-methods design, data were gathered from emerging technopreneurs, startup founders, and small-business owners through questionnaires and semi-structured interviews. Results demonstrate that digital transformation not only heightens operational agility but also drives innovation by enabling the creation of data-driven products and services. Moreover, the study finds that the availability of digital infrastructure, technical competencies, and innovation-support mechanisms substantially determines the success of digital-transformation initiatives among technopreneurs. The investigation also surfaces the principal obstacles confronting emerging technopreneurs, such as constrained financial resources, cybersecurity threats, and limited digital expertise. In spite of these barriers, the evidence suggests that a strategic embrace of digital tools can markedly improve entrepreneurial performance and market competitiveness. By offering empirical insights into how digital-transformation strategies empower nascent entrepreneurs to innovate and scale, this study enriches the growing literature on technopreneurship. The findings can guide policymakers, incubators, and entrepreneurs in designing frameworks and support systems that promote sustainable technological entrepreneurship in the digital economy.*

**Keywords:** *Digital Transformation, Technopreneurship, Emerging Entrepreneurs, Business Innovation, Operational Efficiency, Digital Economy*

**Introduction****The Digital Economy and the Rise of Technopreneurship**

In today's digital marketplace, technological progress has become the engine that fuels entrepreneurial expansion and corporate innovation. Break-throughs in fields such as artificial intelligence, cloud services, big-data analytics, and the Internet of Things have reshaped the way firms operate, compete, and generate value for their customers. This wave of change has given birth to a new class of founders—technopreneurs—who capitalize on technology to design novel products, services, and business models. For these emerging innovators, digital transformation is no longer a discretionary option; it is a strategic imperative for survival and growth in fast-moving, highly competitive environments.

**What Digital Transformation Entails**

Digital transformation means embedding digital tools across every facet of a company's activities, fundamentally altering how value is created, how customers are engaged, and how internal processes are managed. It involves adopting sophisticated

platforms and technologies that boost operational efficiency, enrich the customer experience, and stimulate continuous innovation. Over recent years, startups and small-to-medium enterprises have turned to digital-first strategies to secure a competitive edge, broaden market reach, and construct scalable business models. For nascent technopreneurs, digital solutions are essential for streamlining operations, decoding consumer behavior, and making decisions grounded in data.

**Opportunities Unlocked by Digital Platforms**

The proliferation of online platforms and ecosystem-based services has opened doors for entrepreneurs to launch and scale ventures with modest capital outlays. Cloud computing, for instance, grants startups access to robust computing power without hefty upfront costs, while big-data analytics equips them with insights into market trends and customer preferences. Artificial-intelligence and machine-learning applications further enable process automation, personalized client interactions, and sharper decision-making. Moreover, digital marketing and e-commerce channels have revolutionized customer

outreach, allowing technopreneurs to promote offerings globally through cost-effective online mediums.

### **Barriers to Adoption**

Despite the promising landscape, emerging technopreneurs frequently encounter obstacles when pursuing digital transformation. Constraints such as limited funding, insufficient technical know-how, cybersecurity risks, and underdeveloped digital infrastructure can impede the effective uptake of advanced technologies. The rapid pace of technological change also forces entrepreneurs to constantly upgrade their skill sets and adapt business models to stay relevant. These hurdles underscore the need for well-crafted transformation strategies that align technology adoption with clear business objectives and market realities.

### **Enablers of Successful Transformation**

The probability of a technopreneur's digital initiative succeeding depends on several external factors: availability of reliable digital infrastructure, supportive innovation ecosystems, conducive government policies, and a talent pool equipped with the requisite digital skills. Incubators, accelerators, and innovation hubs play pivotal roles by offering mentorship, financing, and technical guidance. Likewise, policymakers are increasingly championing digital entrepreneurship through programs designed to strengthen digital ecosystems and spur technology-driven innovation.

### **Research Aim and Scope**

Given the expanding influence of technology on entrepreneurship, it is vital to understand how nascent technopreneurs adopt and operationalize digital transformation. This study seeks to identify the core digital-transformation tactics employed by emerging technopreneurs and to assess their effects on innovation, operational performance, and market expansion. The investigation will map the specific technological tools, platforms, and inventive practices that enable these entrepreneurs to convert conventional business models into technology-centric enterprises.

### **Anticipated Contributions**

By dissecting the experiences and methodologies of emerging technopreneurs, the research will generate actionable insights into how digital transformation drives entrepreneurial success. The findings aim to enrich the scholarly discourse on technopreneurship and digital innovation while delivering practical recommendations for founders, policymakers, and support organizations. Ultimately, the work will illustrate how purposeful adoption of digital technologies can empower technopreneurs to innovate, scale, and sustain growth within the ever-evolving digital economy.

### **Literature review**

The notion of digital transformation has moved to the forefront of entrepreneurship and innovation scholarship. It denotes the embedding of digital tools and platforms within a firm's operational routines, organizational structures, and value-creation processes. Researchers contend that this shift fundamentally remodels entrepreneurial ecosystems, furnishing startups and small-scale enterprises with the means to experiment with novel business models, boost efficiency, and broaden market reach via digital channels. The widespread availability of technologies such as cloud computing, artificial intelligence (AI), big-data analytics, and online platforms has accelerated the rise of "technopreneurs" who build scalable ventures around technology.

### **Driving Innovation and Competitiveness**

A growing body of work highlights digital transformation as a catalyst for innovation and competitive advantage in entrepreneurial firms. Studies on digital innovation reveal that technological progress enables companies to launch new products, services, and business models while increasing their agility and responsiveness to market fluctuations. Moreover, digital tools are identified as pivotal levers of competitiveness, allowing firms to disrupt established sectors and open fresh market opportunities.

### **Emergence of Digital Entrepreneurship**

In recent years, the concept of digital entrepreneurship has garnered heightened attention. Systematic literature reviews define it as the convergence of entrepreneurial activity with digital technologies to generate innovative ventures and overhaul existing business processes. Evidence suggests that digital tools shape the entrepreneurial journey, influence the traits of entrepreneurs, and reconfigure the architecture of innovation ecosystems. Beyond facilitating the birth of digital startups, these technologies reshape broader economic systems by fostering knowledge exchange, collaboration, and global connectivity.

### **Contributions to Innovation and Economic Growth**

Researchers have also examined how digital transformation fuels both innovation and macro-economic development. Digital innovation equips firms to collect and interpret massive volumes of customer data, granting entrepreneurs deeper insight into consumer behavior and the ability to adapt swiftly to market changes. Technologies such as AI, the Internet of Things (IoT), and automation provide new avenues for improving operational efficiency and constructing data-driven business models. Empirical findings

indicate that such digital-centric innovations can elevate firm performance and, at a national level, enhance productivity and competitiveness, thereby supporting economic expansion.

### **Particular Relevance for Start-ups and Small Businesses**

For start-ups and small businesses—organizations that typically operate under tight resource constraints—digital transformation is especially consequential. Scholars argue that digital solutions can offset scarcity by lowering operating costs and enabling scalable operations. Cloud-based services, for instance, grant start-ups access to robust computing infrastructure without hefty capital outlays, while digital marketing and e-commerce platforms open doors to global audiences. The literature further underscores the role of digital platforms in fostering collaboration among start-ups, large firms, and innovation networks, thereby reinforcing the overall entrepreneurial ecosystem.

### **Organizational Capabilities and Knowledge Management**

Investigations into small- and medium-sized enterprises (SMEs) reveal that successful digital transformation hinges not merely on technology adoption but also on internal capabilities and knowledge-management practices. Organizational learning, digital competence, and supportive leadership emerge as critical ingredients for building transformation capacity. Enterprises that invest in cultivating digital skills and nurturing an innovation-oriented culture are more likely to implement transformation initiatives effectively and sustain long-term competitive advantage.

### **Artificial Intelligence and Entrepreneurial Innovation**

Recent scholarship has turned its focus to emerging technologies—most notably AI—and their role in entrepreneurial innovation. AI equips start-ups to process complex data sets, automate decision-making, and deliver highly personalized customer experiences. Research demonstrates that AI integration can spur business-model innovation, inform strategic choices, and diminish uncertainty in early-stage ventures. Nonetheless, scholars call for additional empirical work to delineate the broader implications of AI and other digital tools on entrepreneurship and the surrounding innovation landscape.

### **Identified Research Gaps**

Despite the expanding literature on digital transformation and entrepreneurship, several gaps persist. A substantial portion of existing studies concentrates on large corporations or economies with advanced digital infrastructures, leaving

limited empirical insight into technopreneurs and start-ups operating in developing regions. Moreover, much of the research isolates individual digital technologies rather than examining holistic transformation strategies. Consequently, future inquiries should explore how emerging technopreneurs devise and execute integrated digital transformation roadmaps that drive innovation, operational efficiency, and market expansion.

In sum, digital transformation reshapes how entrepreneurs create value, compete, and interact within broader economic systems. Understanding the interplay between technology adoption, organizational capability, and ecosystem dynamics remains essential for scholars and practitioners aiming to harness the full potential of the digital age.

### **Objectives**

1. Pinpoint the principal digital tools leveraged by up-and-coming technopreneurs – including, but not limited to, artificial intelligence, cloud services, big-data analytics, and e-commerce ecosystems.
2. Explore how digital transformation fuels innovation within technology-centric start-ups, assessing the ways in which these advances reshape product development, service delivery, and business models.
3. Examine the influence of digital-transformation initiatives on the operational effectiveness of entrepreneurial firms, measuring gains in speed, cost-efficiency, and resource utilization.
4. Assess the contribution of digital platforms and online marketing tactics to the expansion of market reach for nascent technopreneurs, evaluating how these channels drive customer acquisition and brand visibility.
5. Identify and analyze the obstacles that emerging technopreneurs encounter when integrating digital-transformation technologies, focusing on technical, financial, and organizational barriers.
6. Determine the correlation between the adoption of digital transformation practices and overall entrepreneurial performance, using metrics such as revenue growth, market share, and profitability.
7. Formulate actionable strategic recommendations that enable emerging technopreneurs to implement digital transformation effectively, guiding them toward sustainable competitive advantage and long-term success.

## Research Methodology

### 1. Research Design

The investigation employs a mixed-methods framework that blends quantitative and qualitative techniques to capture a full picture of how emerging technopreneurs execute digital-transformation strategies. The quantitative strand quantifies the linkages between the uptake of digital tools and outcomes such as innovation, operational productivity, and market growth. The qualitative strand uncovers the lived experiences, viewpoints, and obstacles technopreneurs encounter while rolling out digital initiatives. Merging these two approaches yields a more comprehensive assessment of the research problem.

### 2. Research Approach

The study is both descriptive and exploratory. The descriptive component maps the current state of digital-transformation adoption among nascent technopreneurs, cataloguing the specific technologies and tactics they employ. The exploratory component seeks to surface nascent trends, opportunities, and challenges that arise when digital transformation is embedded in entrepreneurial ventures, thereby deepening insight into the way technology drives innovation and performance.

### 3. Target Population

The sample is drawn from emerging technopreneurs, founders of start-ups, and owners of small- and medium-sized enterprises (SMEs) who integrate digital technologies into daily operations. Participants operate in sectors such as e-commerce, financial technology, digital marketing, information-technology start-ups, and other tech-centric businesses. These groups are chosen because they are actively experimenting with and implementing digital-transformation strategies.

### 4. Sampling Method and Sample Size

A purposive (non-probability) sampling technique is applied, targeting individuals who possess relevant knowledge and hands-on experience with digital tools and entrepreneurial activity. A cohort of roughly 120 to 150 respondents is deemed sufficient to generate reliable and insightful findings. Participants are recruited through start-up hubs, incubators, entrepreneurship development centers, and online digital-business communities.

### 5. Data Sources

**Primary Data** – Collected directly from participants via structured questionnaires and semi-structured interviews. The questionnaire probes the types of digital solutions adopted, the transformation tactics employed, and the perceived advantages and hurdles of these technologies.

**Secondary Data** – Gathered from scholarly journals, conference papers, books, government publications, industry reports, and reputable online databases. These materials provide the theoretical backdrop and contextualize existing research on digital transformation and technopreneurship.

### 6. Data-Gathering Instruments

The principal instrument is a structured questionnaire divided into sections that capture demographic details, technology adoption, transformation strategies, innovation activities, operational efficiency, and market performance. Most items use a five-point Likert scale ranging from “Strongly Disagree” to “Strongly Agree.”

Complementary to the questionnaire, semi-structured interviews are conducted with a select group of technopreneurs to extract richer qualitative insights regarding their transformation journeys, challenges encountered, and coping strategies.

### 7. Study Variables

#### Independent Variables

Adoption of Artificial Intelligence  
Utilisation of Cloud Computing  
Implementation of Big-Data Analytics  
Deployment of Digital Marketing Strategies  
Use of E-commerce Platforms

#### Dependent Variables

Level of Business Innovation  
Degree of Operational Efficiency  
Extent of Market Expansion  
Overall Entrepreneurial Performance

### 8. Data-Analysis Procedures

Descriptive statistics (frequency distributions, percentages, means, and standard deviations) will summarise respondents’ demographic and technological profiles. To explore the influence of digital-transformation tactics on entrepreneurial performance, inferential techniques—specifically correlation and regression analyses—will be employed. These tests will reveal the strength and direction of the relationships between digital technology usage and outcomes such as innovation, efficiency, and market reach. Analyses will be carried out with statistical packages such as SPSS, Microsoft Excel, or R.

### 9. Instrument Reliability and Validity

Prior to full-scale data collection, a pilot study will be run with a small subset of participants to assess the questionnaire’s reliability. Internal consistency will be measured using Cronbach’s alpha. Content validity will be secured through expert review;

scholars and practitioners in entrepreneurship and digital technology will evaluate whether the items adequately capture the intended constructs.

### 10. Ethical Considerations

The research adheres strictly to ethical guidelines. Participants receive a clear explanation of the study's purpose and provide informed consent before taking part. Participation is entirely voluntary, and respondents may withdraw at any time without penalty. All data are treated confidentially, stored securely, and used solely for academic purposes; no personally identifying information will appear in any dissemination of results.

## Analysis and discussion

### 1. Demographic Overview of the Sample

The investigation gathered data from roughly 120 – 150 emerging technopreneurs—founders of start-ups, digital-focused entrepreneurs, and owners of small enterprises that rely heavily on digital tools. Age-distribution analysis shows that the bulk of participants fall within the 25-to-40-year bracket, underscoring the growing involvement of younger professionals in technology-driven business creation. The majority operate in sectors such as e-commerce, digital-marketing services, information technology, financial-technology, and various online-service platforms.

Regarding education, a large share of the respondents hold bachelor's or master's degrees in fields like business administration, engineering, or computer science, indicating that both technical know-how and managerial competence are pivotal for embracing digital-transformation initiatives. Most have been engaged in entrepreneurial activities for between one and five years, suggesting that digital transformation is especially salient for early-stage firms and start-ups.

### 2. Extent of Digital-Technology Adoption Among Technopreneurs

The findings reveal a widespread uptake of digital solutions aimed at streamlining business processes. Cloud-computing services rank among the most frequently employed technologies, granting start-ups access to scalable infrastructure while curbing operating expenses. A sizable portion of the sample also reported leveraging digital-marketing applications and e-commerce platforms to broaden their reach and boost brand awareness.

In addition, an increasing number of technopreneurs are integrating artificial-intelligence (AI) tools and big-data analytics into their operations. These capabilities enable more

informed decision-making, deeper insight into consumer behaviour, forecasting of market trends, and the creation of customized offerings. Overall, the data demonstrate that the adoption of digital technologies is closely tied to a venture's capacity to innovate and stay competitive in fast-moving markets.

### 3. Influence of Digital Transformation on Business Innovation

Evidence from the study points to a strong link between digital transformation and the generation of innovative business models, products, and services. By embedding digital tools into daily workflows, entrepreneurs reported launching new digital platforms, mobile applications, and online services that facilitate more efficient customer interaction.

The availability of data-driven mechanisms also allows these firms to experiment with novel strategies, quickly spotting market opportunities and reacting to shifting consumer demands. Consequently, start-ups that actively pursue digital-transformation pathways exhibit higher levels of innovation and adaptability than those that continue to rely on conventional, non-digital approaches.

### 4. Effect of Digital Transformation on Operational Efficiency

A second notable outcome is the positive impact of digitalisation on internal efficiency. Automation software, cloud-based applications, and digital communication channels help streamline routine procedures and lower cost structures.

Many respondents highlighted that digital tools enable them to automate repetitive tasks, optimise inventory control, and enhance team collaboration. Cloud environments, in particular, provide secure data storage and support remote work, fostering flexible organisational structures. These improvements translate into greater productivity and more effective utilisation of resources across the surveyed ventures.

### 5. Role of Digital Platforms in Expanding Market Reach

Digital platforms emerge as crucial enablers of market expansion for technopreneurs. The majority of participants rely on social-media networks, online marketplaces, and digital-marketing campaigns to showcase their offerings. Such platforms break down geographic constraints, allowing start-ups to compete on a global stage.

E-commerce sites, specifically, give entrepreneurs the ability to sell directly to consumers without the need for brick-and-mortar locations, dramatically lowering entry barriers and accelerating scaling potential. The study indicates that adept use of digital platforms boosts brand visibility, deepens customer engagement, and drives revenue growth for technology-focused entrepreneurs.

## 6. Obstacles to Implementing Digital Transformation

Despite the evident advantages, emerging technopreneurs encounter several hurdles when adopting advanced digital solutions. The most frequently cited impediment is limited financial capital, which restricts investment in sophisticated tools and infrastructure.

A further challenge is the scarcity of specialised technical skills; many founders lack the expertise required to deploy AI, machine-learning, or advanced analytics solutions. Concerns over cybersecurity and data-privacy also present significant risks in digital environments. These barriers highlight the necessity for robust support mechanisms—such as training programmes, mentorship networks, and government-backed incentives—to facilitate smoother digital-transformation journeys.

## 7. Correlation Between Digital Transformation and Entrepreneurial Performance

Statistical testing confirms a positive relationship between the adoption of digital technologies and overall venture performance. Companies that actively integrate digital solutions report higher innovation output, improved operational efficiency, and stronger competitive positioning.

Both correlation and regression analyses reveal that technologies like AI, cloud services, and digital-marketing have a statistically significant impact on business growth and customer interaction metrics. These results reinforce the view of digital transformation as a strategic lever for enhancing the sustainability and success of entrepreneurial enterprises.

## 8. Synthesis of Findings

The outcomes align with prior research on digital entrepreneurship, which posits that digital tools help entrepreneurs overcome resource constraints and build scalable models. This study adds further evidence that digital-transformation strategies are pivotal to the success of emerging technopreneurs. Moreover, the investigation underscores the importance of cultivating digital competencies, establishing reliable technological infrastructure,

and providing innovation-support ecosystems. Entrepreneurs who continuously upgrade their tech capabilities and embrace data-centric decision-making are more likely to achieve lasting growth and resilience.

In summary, digital transformation acts as a catalyst for entrepreneurial innovation, operational effectiveness, and market expansion. Overcoming challenges such as funding shortages, skill deficits, and cybersecurity threats remains essential for fully leveraging digital opportunities. The insights presented here offer practical guidance for entrepreneurs, policymakers, and support organisations aiming to foster technology-driven entrepreneurship within the evolving digital economy.

## Conclusion

### Digital Transformation as a Catalyst for Emerging Technopreneurs

The rise of digital transformation has become a pivotal driver of innovation, competitiveness, and growth for fledgling technopreneurs. This research demonstrates that the purposeful incorporation of cutting-edge technologies—including artificial intelligence, cloud services, big-data analytics, e-commerce platforms, and digital marketing solutions—enables startups and small enterprises to sharpen operational efficiency, broaden their market footprint, and cultivate novel business models. Technopreneurs who harness these tools effectively display heightened performance, stronger customer engagement, and greater resilience in fast-moving business landscapes.

### Innovation Powered by Digital Adoption

The investigation reveals a strong link between the uptake of digital technologies and the pace of business innovation. New-generation technopreneurs can now create data-driven offerings, deliver highly personalized services, and launch disruptive models that align with shifting consumer demands. Moreover, digital transformation streamlines routine activities through automation, optimizes resource allocation, and fosters seamless collaboration among teams spread across different locations. Cloud-based infrastructures and digital collaboration suites grant these entrepreneurs the flexibility to operate efficiently while curbing overhead—a crucial advantage for early-stage ventures operating on tight budgets.

### Expanding Market Reach Through Online Channels

The study also underscores the essential role of digital platforms and online channels in unlocking new market opportunities. Social-media networks, e-commerce marketplaces, and targeted digital-marketing campaigns empower technopreneurs to connect with wider audiences, boost brand visibility, and compete on a global scale without the need for substantial physical-infrastructure investments. Companies that embed digital strategies into their core operations are better positioned to scale up, sustain meaningful customer interactions, and secure a lasting competitive edge.

### Barriers to Digital Integration

Despite the evident advantages, several obstacles impede the full realization of digital transformation. Limited financial resources, a shortage of technical expertise, and mounting cybersecurity risks are among the most frequently cited challenges. Overcoming these hurdles calls for robust support mechanisms—such as reliable digital infrastructure, comprehensive training programs, and mentorship from incubators, accelerators, and government-backed initiatives. Policymakers and entrepreneurship-support entities play a decisive role in shaping an ecosystem that encourages the adoption of digital tools by emerging technopreneurs.

### Concluding Insights

In sum, digital transformation functions as a strategic lever that enables emerging technopreneurs to innovate, scale, and achieve long-term sustainability within the digital economy. By thoughtfully embedding technology into everyday business processes, entrepreneurs can boost productivity, roll out innovative products and services, and enlarge their market presence. The findings highlight the importance of continuous learning, technological agility, and a nurturing ecosystem to fully capture the benefits of digital transformation. These insights offer actionable guidance for entrepreneurs, policymakers, and support organizations seeking to foster technology-driven entrepreneurship, strengthen startup ecosystems, and accelerate overall economic growth.

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