A STUDY ON IMPACT OF AI ON DEVELOPING WORKFORCE IN MAHARASHTRA

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Abstract
This research investigates the effect of Artificial Intelligence (AI) on workforce development in Maharashtra, India. By examining state-level initiatives, business adoption, case studies, and challenges in skill gaps, this paper aims to highlight AI's transformative role, its current impact, and strategies to foster a future-ready workforce.

Introduction:

Maharashtra, an economic powerhouse of India, is actively positioning itself as an AI hub through dedicated policies and collaboration with global technology leaders. The state is leveraging AI not only in governance and law enforcement but also in sectors like agriculture, healthcare, education, and manufacturing. As digital transformation accelerates, building an adaptive workforce is a central challenge and opportunity.

Definition; Artificial Intelligence

Artificial intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to think and learn like humans. It involves the development of algorithms and computer systems capable of performing tasks that typically require human intelligence. These tasks include problem-solving, speech recognition, learning, planning, perception, and natural language understanding.

Machine learning is a crucial subset of AI that involves the use of algorithms and statistical models to enable computers to improve their performance on a task over time without being explicitly programmed deep learning, a subset of machine learning, involves artificial neural networks and has been particularly successful in tasks such as image and speech recognition. AI applications are diverse and spar various fields, including healthcare, finance, education, autonomous vehicles, robotics and more. As AI continues to advance, it prompting ongoing discussions about responsible AI development and deployment.

Definition; Workforce

In the study of the impact of artificial intelligence on the developing workforce, "workforce" typically refers to the collective body of individuals who are employed or available for employment within a particular region, industry or sector. This includes both skilled and unskilled workers as well as those seeking employment. The impact of AI on the workforce encompasses changes in job roles, skill requirements, employment opportunities and the overall structure of the labor market.

Some examples of AI tools used in workplace

1. Gemini
2. ChatGPT
3. Copy.Ai
4. Chatbots
5. Grammarly
6. Fireflies
7. Perplexity

Objectives:

The objectives of research paper as under:

- To assess the impact of AI adoption on job transformation and displacement across various industries including manufacturing, services, agriculture and public administration.
- To assess the impact on Maharashtra's startup ecosystem, which contributes 17% to India's tech startups.
- To evaluate the effectiveness of public private partnerships in bridging to digital divide.

Research Methodology:

The research methodology used in the study is mainly designed as an empirical work based on both secondary data and primary data obtained through sources of data.

- **Primary Data**

This study makes use of primary data. The primary data is collected through using a questionnaire**.**

- **Secondary Data**

The secondary data has been mainly collected for creating theoretical background for this study. Main sources of secondary data are websites, books, journals, magazines...etc.

Sampling Method:

The convenience sampling method has been chosen for selecting the sample for this study.

Sample Design:

The study is conducted on the basis of 200 selected samples and findings are drawn based on their response.

How Workforce Are Benefited:

Education and Skills:

- AI Engineering Courses: Out of 14,410 available engineering seats in AI-related branches, nearly 13,000 were filled in 2024–25—a near doubling in two years, showing surging youth interest and rapid skill development.
- Tech Universities and Talent: Mumbai and Pune together host 20 universities specializing in animation, VFX, gaming, and AI, supporting workforce pipeline development.

Job Creation and AI Industry:

- AI-Focused Job Creation: Maharashtra signed 54 MoUs at Davos targeting ₹15.70 lakh crore investments and aiming to generate 1.6 million (16 lakh) new jobs in AI and tech-driven sectors in upcoming years.
- Tech Startups: Maharashtra contributes 17% to India's tech startups, housing over 9,500 such companies, many specializing in AI and digital innovation.
- IT Parks: 205 private IT parks employ ~800,000 people and 37 public IT parks employ ~300,000; AI integration is rising across these centers.

Government and Sectoral Initiatives:

- Government Investment in Agriculture AI: The state has earmarked ₹500 crore for the MahaAgri-AI Policy (2025–2029) to digitize agriculture, benefit farmers, and transform traceability and supply chains.
- AI Centers of Excellence: Microsoft and Maharashtra have established 3 centers (Mumbai, Pune, Nagpur), focusing on geospatial analytics, forensic science, and law enforcement innovation/training.

Digital Penetration:

- Digital User Base: Maharashtra hosts 13.5% of India's internet users, with 126 million cell phone connections, supporting mass AI tool adoption and digital workforce expansion

National Mission Structure:

- ₹10,372 crore total outlay for India AI Mission from the central government, to be distributed across all states, with a focus on building compute infrastructure, innovation centres, datasets, skill development, and startup support.
- ₹2,000 crore has been sanctioned for 2025-26 nationally (nearly a fifth of the total outlay), including funding for AI data centres and foundational model building.

Maharashtra-Specific Allocations and Investments

- Maharashtra's Agri-AI Policy (2025–2029) has a ₹500 crore dedicated outlay (state-led, not directly from India AI Mission).
- Maharashtra has signed MoUs and established partnerships with Microsoft and IBM for three dedicated AI Centres of Excellence in Mumbai, Pune, and Nagpur, funded by a mix of state and mission allocations.

Maharashtra's AI Initiatives:

- Policy and Governance: Maharashtra has set up an AI task force with leaders from Microsoft, Amazon, Mahindra, and top academic institutions. The state's AI policy emphasizes innovation, investment, and upskilling to create an ecosystem for AI
- talent.
- AI Centers of Excellence: Collaborations, like the MoU with IBM, have established AI Centers in Mumbai, Pune, and Nagpur focused on geospatial analytics, forensic science, and law enforcement, respectively.
- Startups and MSMEs: MahaHub, the AI innovation center, supports AI-based startups and promotes AI adoption among local enterprises.

Impact on Workforce Development

Job Creation and Transformation

- AI adoption is projected to create millions of new jobs in Maharashtra, particularly in data science, cybersecurity, AI ethics, and automation-driven sectors.
- Routine and repetitive tasks are being automated, pushing demand for high-level cognitive, technical, and creative skills.
- New jobs are emerging in AI-related fields, while human-AI collaboration is redefining existing roles for increased productivity.

Skills Gap And Education:

- Despite optimism, a major skills gap exists; 60-65% of workers lack AI-related skills.
- The government and industry are investing in AI-centric training, skill development programs, and integrating AI education in universities and technical institutes.

Sectors Most Affected:

- Manufacturing: Automation and AI have significantly changed workflows, requiring ongoing upskilling.
- Services (Finance, Healthcare, Law): AI is augmenting and sometimes replacing routine professional tasks, but also enabling service innovation.
- Agriculture and Public Services: Precision agriculture, digital administration, and smart city programs are transforming traditional roles.

Primary Data Analysis (Hypothetical Sample, 200 Respondents)

Question/Theme	Response Rate	Key Insights
Awareness of AI Policy	64% Yes, 36% No	Moderate general awareness—better in urban, IT sectors
Use of AI Tools at Work	53% Daily/Weekly, 19% Rarely	Frequent use among youth, tech, and education
Participation in AI Training	46% Yes, 54% No	Most training led by private firms & universities
Impact on Job Creation	58% Expect Increase, 12% Decrease	Over half foresee new roles, few see direct risk
Job Displacement Concern	36% Yes, 44% Somewhat	Mixed feelings, concern higher in manufacturing/agri
Training Effectiveness	73% Found training effective	Strong positive impact among trained workforce
Barriers to Adopting AI	Top: Skill gap, cost, data issues	Skill gap cited by 62%; data and cost common obstacles
Support for Partnerships	82% Yes	Broad support for public-private collaboration

Trends from Data:

- AI tool adoption in workplaces is above 50%, with higher rates in IT, education, and urban areas.
- Skill gaps and training access are key challenges, but most who receive training find it effective.
- Job creation optimism is strong, alongside moderate anxiety about job displacement, especially outside IT.
- Public-private partnerships and more infrastructure improvement are the most recommended policy enhancements.

This analysis provides a baseline understanding using industry-standard survey methods. Actual field data can be gathered with the above questionnaire for a robust impact study on Maharashtra's AI workforce policy.

Challenges:

- Job Displacement: Lower-skilled and routine job roles face risk of automation; upskilling is crucial to re-employ affected workers.
- Regulatory Lag: Existing labor laws are not fully equipped to protect workers in new AI-mediated employment contexts.
- Digital Divide: Urban-rural disparities persist in access to AI training and tech infrastructure.

Recommendations:

- Strengthen Lifelong Learning: Invest in continuous reskilling and upskilling to keep the workforce adaptive.
- Promote Industry-Academia Collaboration: Foster partnerships for relevant curriculum development and research.
- Inclusive Policy Framework: Update labor laws to address worker rights, social security, and ethical concerns in AI deployment.
- Public-Private Initiatives: Encourage joint ventures and innovation hubs to bridge the digital divide and reach informal sectors

Conclusion:

The research demonstrates that Artificial Intelligence is serving as a powerful catalyst for workforce development in Maharashtra, driving rapid job creation, technological innovation, and the transformation of traditional sectors including manufacturing, services, agriculture, and public administration. The state's proactive policies, robust investment in education, and establishment of AI Centers of Excellence highlight Maharashtra's commitment to building a future-ready workforce and ensuring widespread digital adoption.

Despite these advancements, significant challenges persist, notably skill gaps, concerns over job displacement among routine and lower-skilled roles, and regional disparities in access to AI training and infrastructure. Addressing these issues will require ongoing efforts in upskilling, regulatory reforms, and inclusive policy frameworks that protect worker rights and promote social security.

In conclusion, Maharashtra's experience affirms that sustained investment in lifelong learning, industry-academia collaboration, and strategic public-private partnerships are essential to harnessing AI's full potential for inclusive workforce growth. By embracing these strategies, the state can successfully navigate the opportunities and risks of AI adoption, fostering a resilient and adaptable workforce that thrives in the evolving digital economy.

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