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"Impact of Artificial Intelligence on the Job Market" - A Study of an Electronics Industry in Akola District

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Abstract: *This research examines the impact of Artificial Intelligence (AI) on the electronics industry in Akola District, focusing on how automation influences local employment and workforce skills. By analyzing perspectives from both employees and employers, the study finds that AI acts primarily as a transformative tool rather than a source of mass job displacement. While the adoption of smart technologies is widespread and viewed positively for increasing efficiency, a significant gap exists between the rapid use of these tools and the formal training provided to the workforce.*

Keywords: Artificial Intelligence, Job Market, Electronics Industry, Akola District, Skill Gap, Workforce Transformation

I. INTRODUCTION

AI, or Artificial Intelligence, is considered as one of the most powerful and stunning technology of today's time. Artificial Intelligence has transformed the world in the same way that electricity and the internet once did. "The global economy is entering a new era where digital systems, data analytics, robotics, and automation are driving productivity and innovation." AI is no longer a concept limited to laboratories but it is now being used in small shops, startups, and even at the household level.

One of the most discussed topics related to Artificial Intelligence, is "impact of AI on employment." On one hand, AI and automation enable business to save time, decrease expenses and enhance productivity. In contrast to that, AI is reducing the need for human involvement in repetitive and routine activities.

The electronics field is one of the fastest adopters of AI. The adoption of intelligent technology in electronics has transformed the design, production and maintenance of products. AI is improving the accuracy by eliminating the human mistakes in mobile-phone assembly, as well as in chip design and testing. AI has also made a markable change in the marketing strategies, billing systems, and inventory management. Introduction of Artificial Intelligence (AI) has changed how this industry functions. As it makes the processes faster, smarter, and more efficient.

Here Akola city is the central hub for retail businesses, electronics shops, repair centers and small manufacturing units. The electronics industry in Akola district comprises of small and medium-sized enterprises (SMEs). It includes stores such as, mobile and computer repair shops, television and appliance dealers, hardware distributors, and electronic component suppliers.

Electronics businesses such as local retailers, service centers, and repair shops are benefited from AI. As AI acts as the backbone for local businesses. Small shopkeepers now use various AI-based mobile software to easily perform their daily operations. For example:

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Table 1.1 AI Powered Tools

Application Area	AI Tool/Software	Purpose
Billing & Accounting	Vyapar, Marg ERP	Automated invoicing
Customer Management	Zoho CRM, HubSpot	CRM & sales tracking
Inventory Management	Tally Prime Smart, Deskera	Stock monitoring
Marketing	Canva AI, Meta Ads AI	Advertisement creation
Technical Support	ChatGPT, RepairDesk AI	Customer query assistance

Table 1.3 lists commonly used AI powered tools that small businesses use to simplify the operations, reduce manual work, and improve productivity.

II. REVIEW OF LITERATURE

Brynjolfsson and McAfee (2014) in their work on the "Second Machine Age" showed that while AI and digital technologies significantly increase productivity and economic growth, they also create a "great decoupling" where median income fails to keep pace with GDP, suggesting a growing disparity in the job market between high-skilled and low-skilled workers.

Frey and Osborne (2017) demonstrated in their highly cited study that approximately 47% of total US employment is at high risk of being automated. Their research specifically showed that occupations in logistics, office support, and basic manufacturing—similar to those found in the regional electronics industry—are the most susceptible to AI-driven displacement.

Acemoglu and Restrepo (2019) showed that the impact of AI on the job market is a balance between a "displacement effect" (machines replacing human labor) and a "reinstatement effect" (the creation of new, complex tasks where humans have a comparative advantage). Their study showed that the net effect on employment depends heavily on the speed of workforce upskilling.

Davenport and Kirby (2016) showed that the most successful adaptation strategy for employees is "augmentation" rather than "automation." Their research showed that workers who learn to work *with* smart machines—utilizing AI for data-heavy tasks while focusing on human-centric problem solving—experience higher job security and career growth.

Research Gap: Most existing studies focus on global or metropolitan trends, with almost no research specifically examining AI's impact on the electronics industry in smaller districts like Akola.

III. RESEARCH METHODOLOGY

3.1 Objectives of the Study: Every research study is guided by certain objectives that define its direction and focus. The following research objective will help us understanding the impact of Artificial Intelligence (AI) on job market within the electronics industry, particularly in Akola District.

The main objectives of the study are as follows:

To study the impact of Artificial Intelligence on the job market in the electronics industry of Akola district.

To analyze the extent to which Artificial Intelligence (AI) is being adopted in the electronics sector of Akola.

To examine the perception of employers, workers, and shopkeepers regarding the role of AI in their work.

To identify the challenges faced by job seekers and employees in adapting to AI-driven changes.

To suggest practical measures for training, upskilling, and preparing the workforce in the electronics sector for an AI-driven future.

3.2 Research Design

The study employs a Descriptive Research Design.

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3.3 Sources of Data

To ensure a comprehensive analysis, data was collected from both primary and secondary sources:

Primary Data: Gathered directly from the field using two structured questionnaires specifically designed for employers (business owners) and employees (workers/technicians).

Secondary Data: Sourced from academic journals, industry reports (e.g., McKinsey, NASSCOM), government publications, and relevant websites.

3.4 Population and Sampling

Target Population: The population consists of individuals engaged in the electronics sector: including retail, repair, service, and small-scale manufacturing: within the Akola District of Maharashtra.

Sampling Technique: A Convenience Sampling method was used.

Sample Size: The study has a sample size of 100 respondents (50 employees and 50 employers)

3.5 Data Collection Instrument

The primary tool for data collection was the Structured Questionnaire.

The Employee Questionnaire focused on AI awareness, skill sufficiency, and job security perceptions.

The Employer Questionnaire focused on adoption rates, benefits observed, and challenges in hiring skilled labor.

3.6 Data Analysis Tools

The data was analyzed through:

Tabular Representation: For precise numerical data.

Graphical Representation: Using Bar Charts and Pie Charts to visualize trends and comparisons.

3.7 Scope of the Study

The geographical scope is limited to the Akola District. The functional scope is limited to the electronics industry, specifically focusing on the intersection of human labor and AI-driven automation.

Table 3.1: Summary of Research Methodology

Sr. No.	Aspect	Description
1	Type of Research	Descriptive
2	Research Design	Survey Method
3	Type of Data	Primary Data and secondary Data
4	Data Collection Method	Structured Questionnaire
5	Area of Study	Akola district
6	Sampling Technique	Convenience Sampling
7	Sample Size	100 respondents (50 employees, 50 employers)
8	Tools for Data Analysis	Percentage, Charts, Graphs
9	Limitations	Time, Small sample, limited area

IV. DATA ANALYSIS AND INTERPRETATION

4.1 Objective 1: Impact of AI on the Job Market in Akola

The study finds that AI is currently transforming rather than eliminating the local job market. Employer data shows that 71.4% of organizations have maintained their headcount despite AI adoption, suggesting that the "displacement effect" is minimal in regional electronics hubs. However, the qualitative impact is significant: 82% of employees believe AI creates a higher demand for "skilled" workers, indicating a shift in the market toward technical proficiency over manual labor.

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4.2 Objective 2: Extent of AI Adoption in the Electronics Sector

Digitalization has reached a mature stage in Akola. 75.5% of surveyed businesses have adopted AI-based or smart tools (e.g., smart billing, diagnostic software, and digital marketing tools). On the frontline, 88% of employees interact with these tools either "Daily" or "Sometimes." The adoption is most prevalent in IT/Technical departments (39.5%) and Sales & Marketing (31.6%).

4.3 Objective 3: Perception of AI (Employers, Workers, and Shopkeepers)

There is a strong "Positive Alignment" across all categories of respondents.

Employees: 86% hold a positive or very positive view, primarily because 86.8% find AI makes their work easier and more accurate.

Employers/Shopkeepers: 77.5% maintain a positive outlook, driven by observed benefits in time-saving (57.5%) and operational cost reduction (86.3%).

The perception is that AI is a tool for professional growth rather than a threat.

4.4 Objective 4: Challenges in Adapting to AI-Driven Changes

The transition is hindered by two critical "Gaps":

The Knowledge Gap: 47% of employers identify the "Lack of skilled workers" as their primary implementation hurdle.

Skill Anxiety: 66% of employees are either unsure or certain that their current skills will not suffice for an AI-driven future, highlighting a significant psychological and professional barrier for job seekers.

4.5 Objective 5: Practical Measures for Training and Upskilling

The study identifies a critical "Training Gap." While 76% of employees express a desire to attend training programs to learn AI-related skills, only 24.5% of employers currently provide formal, comprehensive training. Most businesses (49%) only provide "partial" guidance, leaving a majority of the workforce to self-train or rely on trial-and-error.

V. FINDINGS

Employment Resilience: Despite the integration of automated tools, 71.4% of employers (35 out of 49) confirmed that AI adoption has not led to a reduction in their total staff headcount. This indicates that AI is currently complementing rather than replacing the regional workforce.

Sector-Wide Adoption: Digital transition is widespread, with 75.5% of businesses in Akola's electronics sector now utilizing smart tools for core operations like billing, customer reach, and technical diagnostics.

Productivity Gains: The study found a high level of perceived utility; 88% of employees report that AI makes their daily tasks faster and more accurate, while 57% of employers cite "Time Saving" as the single greatest benefit to their business.

The Competency Gap: A significant "Skill Anxiety" exists among the workforce. 66% of employees feel their current technical skills are insufficient or only "partially" ready to handle upcoming AI-based work systems.

Institutional Training Lag: While employers acknowledge the need for skilled labor, only 24.5% (12 out of 49) provide formal, comprehensive training programs to their staff.

VI. CONCLUSION

The research concludes that the electronics industry in the Akola District is undergoing a structural transformation. AI is not functioning as a "job-killer" in this regional market; instead, it acts as a job-redefiner. While the total number of jobs has remained stable, the *requirements* for those jobs are shifting rapidly toward digital literacy and technical software operation.

The high adoption rate of smart tools has clearly improved operational efficiency across the district. However, a critical disconnect exists: businesses are adopting technology faster than they are training their people. The overall positive

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sentiment from both 50 employees and 49 employers suggests a healthy environment for growth, but the long-term sustainability of the job market depends on closing the "Confidence Gap" through better access to technical education.

VII. SUGGESTIONS AND RECOMMENDATION

To ensure the electronics industry in Akola remains competitive while protecting local employment, the following measures are recommended:

1. Suggestions for Employers / Shop Owners

Provide Structured Training Programs: There is a clear gap between technology adoption and employee training. Employers should organize short-term practical workshops (1–2 days) on tools such as smart billing systems and digital diagnostic software to improve employee efficiency and confidence.

Promote Human-AI Collaboration: Instead of replacing employees, AI should be used as a support system. Employers should encourage staff to focus on customer service and technical problem-solving, while AI handles routine tasks like billing and data management.

Reduce Skill Anxiety: Employers must communicate transparently that AI is intended to assist, not replace workers. This will reduce fear among employees and increase their willingness to learn new technologies.

2. Suggestions for Employees / Workers

Upgrade Technical Skills: Employees should actively participate in training programs and learn to use AI-based tools to stay relevant in the changing work environment.

Focus on Value-Added Skills: Workers should strengthen skills such as troubleshooting, communication, and customer relationship management, which cannot be easily replaced by AI.

Adopt a Positive Mindset Towards AI: Employees should view AI as an opportunity for growth rather than a threat to job security.

3. Suggestions for Educational Institutions

Update Curriculum: Technical institutes and colleges in regions like Akola and Amravati should include modern digital tools and AI-based applications in their syllabus.

Industry-Oriented Training: Institutions should provide hands-on training in AI-based diagnostic tools and inventory management systems to make students job-ready.

4. Suggestions for Government and Policy Makers

Skill Development Programs: Government should initiate skill development schemes focused on AI and digital tools for small-scale industries.

Support for MSMEs: Provide subsidies or financial assistance to small businesses for adopting AI technologies and training employees.

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