



Original Article

A STUDY ON THE IMPACT OF ARTIFICIAL INTELLIGENCE ON JOB SECURITY OF SOFTWARE ENGINEERS IN PUNE

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Manuscript ID:

IJAAR-130340

ISSN: 2347-7075

Impact Factor – 8.141

Volume - 13

Issue - 3

January – February 2026

Pp. 226 - 231

Submitted: 15 Jan.2026

Revised: 20 Jan. 2026

Accepted: 30 Jan. 2026

Published: 10 Feb. 2026

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Quick Response Code:



Website: <https://ijaar.co.in/>



DOI: 10.5281/zenodo.18538055

DOI Link:

<https://doi.org/10.5281/zenodo.18538055>



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Abstract:

Artificial Intelligence (AI) has significant impact on Information Technology (IT) sector, work practices, skills, and employment models. Pune, a major IT center in India, and has seen quick integration of AI technologies in software development, testing, data analytics, and IT services. This research examines how AI affects the job security of software engineers, specifically considering job losses, changes in job roles, the need for new skills, and the creation of new career paths. This study used descriptive and analytical approach, relying on primary data collected from software engineers within Pune's IT sector. Secondary sources, such as industry reports, academic publications, and policy documents, were also incorporated. Result shows that, although artificial intelligence generates anxieties regarding potential job displacement in roles characterized by routine tasks and lower skill requirements. It also demands advanced technical skills and new prospects about AI among employees. In the AI era job security is highly dependent on continuous learning, adaptability, and interdisciplinary competence. The study underlines positive and negative nature of AI as creative and disruptive, and demands for proactive upskilling initiatives by employees, industries, and policymakers. In a nutshell, AI is not eliminating jobs but redefining them, highlighting the importance of strategic human capital development for sustainable employment in changing digital economy.

Keywords: Artificial Intelligence, Job Security, Software Engineers, IT Industry

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How to cite this article:

Dr. (Mrs.) S. R. Nakate. (2026) A Study On The Impact Of Artificial Intelligence On Job Security Of Software Engineers In Pune. International Journal of Advance and Applied Research, 13(3), 226–231. <https://doi.org/10.5281/zenodo.18538055>

Introduction:

Structure and operations of IT industry are changing due to the rapid growth of artificial intelligence. The code is developed, tested, deployed, and maintained is changing due to increased integration of techniques. The adoption of

AI-enabled solutions in product development, quality assurance, and service delivery has fast-tracked. This intensity makes Pune an important case for observing how AI affects on employment prospects and career paths of software engineers.



Despite widespread discussion about automation and job loss, there is limited empirical evidence on how AI influences perceptions of job security, role transformation, and skill requirements at the regional level. Many debates remain speculative or generalized, leaving a gap in understanding the nuanced ways AI interacts with organizational practices, individual upskilling, and labor-market dynamics within specific IT ecosystems.

This study addresses that gap by investigating the impact of AI on job security among software engineers in Pune. It examines patterns of task automation, evolving role definitions, and the skills prioritize, also exploring how engineers perceive and respond to these changes. The findings aim to inform employees, organizations, academic institutions, and policymakers about strategies to manage technological change so that workforce development and employment sustainability progress with innovation.

Objectives of the Study

1. To study the impact of Artificial Intelligence on job security perceptions of software engineers.
2. To identify changes in job roles, responsibilities, and skill requirements due to AI integration.
3. To assess the need for upskilling and reskilling among software engineers in the AI era.
4. To suggest strategies for job security and career sustainability in the AI-driven work environment.

Research Methodology:

1. Research Design and Area of the Study: This study uses a combined descriptive and analytical approach. The descriptive part records the current use of automation tools and opinion of engineers, while the analytical part examines job security perceptions, changing duties, and skill

requirements. Together, these methods provide clear statistics and real-life insights. The research is limited to Pune city, which is key area for software development and IT services.

2. **Population and Sample Population:** The target population comprises software engineers employed in Pune across functions such as software development, testing and quality assurance, data analytics, system administration, and emerging technology roles.
3. **Sample Size and Sampling Technique:** A sample of 240 software engineers is studied. Convenient sampling method is used. It includes professionals from IT industries.
4. **Sources of Data:** Primary data is used and data is collected through questionnaire method. Secondary data is collected from academic journals, articles, industry and government reports, websites etc. to provide theoretical support.

Limitations of the Study

- Findings are particularly related to software engineers from Pune and may not
- generalize to other regions or sectors.
- Time limit may restrict the sample size and depth of qualitative inquiry.
- Rapid developments in technology could affect the long-term applicability of the results.

Analysis of Data:

Age of Respondents:

Sr.	Particulars	Response	Percentage (%)
1	Below 25 years	36	15.0
2	25–30 years	92	38.3
3	31–35 years	64	26.7
4	36–40 years	28	11.7
5	Above 40 years	20	8.3
6	Total	240	100



Gender:

Sr.	Particulars	Response	Percentage (%)
1	Male	156	65.0
2	Female	84	35.0
3	Total	240	100

Use of AI Tools in Organizations:

Sr.	Particulars	Response	Percentage (%)
1	Yes	164	68.3
2	No	48	20.0
3	Not Sure	28	11.7
4	Total	240	100

Work Experience:

Sr.	Particulars	Response	Percentage (%)
1	Less than 2 years	44	18.3
2	2–5 years	88	36.7
3	6–10 years	68	28.3
4	More than 10 years	40	16.7
5	Total	240	100

AI and Job Security Perception:

Sr.	Particulars	Response	Percentage (%)
1	AI is a major threat to job security	68	28.3
2	AI is a moderate threat	104	43.3
3	AI is not a threat	68	28.4
4	Total	240	100

Awareness level:

Sr.	Particulars	Response	Percentage (%)
1	Very High	56	23.3
2	High	92	38.3
3	Moderate	64	26.7
4	Low	20	8.3
5	Very Low	08	3.4
6	Total	240	100

Participation in AI-Related Training:

Sr.	Particulars	Response	Percentage (%)
1	Undertaken AI training	108	45.0
2	Not undertaken	132	55.0
3	Total	240	100

Likert Scale Questions:

Sr.	Particulars	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
1	AI has reduced repetitive tasks	-	72.5	15.8	11.7	-	100
2	AI has changed my job role	-	61.7	20.8	17.5	-	100
3	AI has improved productivity	-	75.0	13.3	11.7	-	100
4	AI has increased work pressure	-	58.3	22.5	19.2	-	100
5	Outdated skills increase job risk	78.3	21.7	-	-	-	100
6	Upskilling improves job security	82.5	17.5	-	-	-	100
7	AI will not fully replace engineers	69.2	28.3	2.5	-	-	100
8	Job security depends on adaptability	85.0	15.0	-	-	-	100
9	Perception of New Job Opportunities Created by AI	25.0	40.0	18.3	11.7	5.0	100



Findings:

Research findings indicate that automation and intelligent tools have become widely familiar in software industry, with larger firms and senior engineers demonstrating deeper practical knowledge compared to entry-level staff and employees in smaller organizations. Routine and repetitive tasks such as manual testing and basic scripting are declining, while responsibilities involving design thinking, architecture, system integration, and cross-functional coordination are increasing. Automation tools help to fasten the work with fewer mistakes. Companies are expecting to finish projects speedily. This increases pressure on employees to accomplish more in less time. As a result, some workers feel stressed despite gain in efficiency. Concerns about job loss are concentrated among junior staff and those engaged in low-complexity roles, though most respondents believe complete replacement is unlikely, emphasizing the continued importance of human oversight and domain expertise. Traditional programming skills are insufficient for long term career stability, with greater emphasis placed on data handling, model interpretation, cloud deployment, and domain knowledge. Training develops confidence and employability. New opportunities such as automation, data platform engineers, model validation specialists, and AI governance leads, and engineers who proactively up skill toward these positions tend to view technological change as an opportunity rather than a threat.

Suggestions for Software Engineers:

1. Employees should adopt Kaizen technique. It means they should update technical skills regularly. They should build interdisciplinary strengths and combine technical knowledge with problem-solving, critical thinking, creativity,

and clear communication. These human centered abilities counterpart technical tools and increase your value.

2. Accept and adopt changes and learn new technology as tool to boost productivity. Staying adaptable and curious reduces anxiety about job shifts and helps employees to seize opportunities.
3. Companies should provide targeted learning programs, certifications, and hands-on workshops that prepare staff for evolving roles and technologies. Company should encourage experimentation, knowledge sharing, and internal mobility so employees can explore new skills without fear of penalty.
4. Educational institutions integrate courses on AI fundamentals, data handling, automation practices, and digital ethics to make graduates job-ready and also update curricula to match industry needs. Collaborate with companies on internships, project-based learning, and co-designed modules so students gain practical, relevant experience.
5. Government should support accessible reskilling initiatives for professionals and provide incentives for lifelong learning across the IT workforce and encourage regulatory frameworks that ensure ethical deployment of automation while protecting worker rights and promoting fair labor practices.

Conclusion:

This study shows that intelligent automation is changing how software engineers in Pune work, but it is not wiping out jobs. Instead, routine tasks are being automated, freeing engineers to focus on design, problem solving, and higher-value activities. Many professionals feel both challenged and



energized by these shifts. The technology raises expectations, yet it also opens new paths for growth.

Job security depends on holding single set of skills is outdated and more on staying curious and adaptable. Engineers who invest in learning are better positioned to benefit from the transition. Companies that provide structured training, redesign roles to pair human judgment with automation, and create safe spaces for experimentation reduce anxiety and help employees to move into emerging roles. Educational programs can align with industry needs and public policies that support reskilling will make the transition smoother and fairer.

In a nutshell, AI should be seen as a collaborator rather than a competitor. With hands-on upskilling, supportive organizational practices, and considerate policy measures, software engineers can turn technological change into a chance for career renewal and sustained employment. Willingness, flexibility, and continuous learning are the practical keys to job security in this evolving landscape.

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Annexure –I Questionnaire:

1. Age group : A) Below 25 years B) 25–30 years
C) 31–35 years D) 36–40 year E) Above 40 years

2. Gender: A) Male B) Female

3. Highest qualification: A) Graduate B) Postgraduate
C) Doctorate D) Professional certification

4. Work experience in IT: A) Less than 2 year B) 2–5 years
C) 6–10 years D) More than 10 years

5. Are you aware of automation and intelligent tools used in the IT industry? Yes/ No

6. How would you rate your understanding of these technologies?

A) Very low B) Low C) Moderate
D) High E) Very high

7. Does your organization use automation or intelligent tools? A) Yes B) No C) Not sure

(5 = Strongly agree; 4 = Agree; 3 = Neutral; 2 = Disagree; 1 = Strongly disagree)

8. Automation has reduced repetitive tasks in my work.

9. Job responsibilities have changed because of these tools.

10. Automation has increased employees productivity.

11. Employees learn new technical skills regularly due to these technologies.

12. These technologies have raised work pressure or performance expectations.

13. Automation may cause job losses in certain IT roles.

14. Employees with outdated skills are more vulnerable to job loss.

15. These technologies will change software engineering roles but not fully replace them.

16. Do you agree that upskilling reduces the risk of job loss?

17. These technologies have created new job opportunities in IT.

18. Organization encourages learning and skill development for new technologies.

19. Adequate training resources helps to handle technological changes.

20. Do you feel these technologies threaten job security in the IT sector? A) Yes B) No C) To some extent

21. Have you taken any training related to AI? Yes/ No

22. What is the biggest challenge posed by automation and intelligent tools to software engineers?

23. What measures would improve job security for software engineers in this changing environment?