IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 5, October 2026
Impact Factor: 8.2

Impact of Artificial Intelligence on Employee Productivity and Managerial Decision-Making

Mr. Jainish Gotecha[1], Mr. Sandip Rawool[2], CA Dhvani Shah[3]
Faculty and Academic Co-ordinator, Nest Academy of Event Management and Development (Naemd Mumbai)[1]
Assistant Professor, Thakur Shyamnarayan Degree College[2]
Co-ordinator of Bcom (International Accounting), Lala Lajpat Rai College of Commerce and Economics[3]
jainishgotecha@gmail.com, rawoolsandipn@gmail.com, dhvani.shah125@gmail.com

Abstract: *Artificial Intelligence (AI) has emerged as a transformative technology influencing employee productivity and managerial decision-making in contemporary organisations. This study examines the impact of AI adoption on workplace efficiency, employee performance, and the quality of managerial decisions. AI-powered tools facilitate task automation, data analysis, workflow optimisation, and real-time information processing, enabling employees to improve productivity and managers to make faster, evidence-based decisions. However, the effectiveness of AI depends on factors such as technological infrastructure, employee competencies, organisational readiness, and ethical implementation. The study also considers potential challenges, including job displacement, algorithmic bias, data privacy concerns, and excessive dependence on automated systems. It emphasises the importance of human–AI collaboration in achieving sustainable organisational performance. The findings are expected to provide insights into how organisations can strategically integrate AI into business operations while maintaining accountability, employee engagement, and managerial effectiveness. The study contributes to understanding AI-driven workplace transformation and its implications for organisational growth and competitiveness*

Keywords: Artificial Intelligence (AI), Employee Productivity, Managerial Decision-Making, Workplace Automation, Organisational Performance.

I. INTRODUCTION

Artificial Intelligence (AI) has emerged as a significant technological innovation transforming modern business operations, employee performance, and managerial practices. The integration of AI into organisational processes has created new opportunities to enhance operational efficiency, automate repetitive tasks, improve information processing, and support strategic decision-making. Organisations across various industries are increasingly adopting AI-powered applications to streamline workflows, reduce operational costs, and strengthen their competitive position in a rapidly changing business environment.

Employee productivity is a critical determinant of organisational success, as it reflects the efficiency with which employees utilise available resources to achieve organisational objectives. AI technologies, including machine learning, natural language processing, generative AI, and intelligent automation, can support employees by reducing routine workloads, improving task accuracy, and enabling faster access to relevant information. These capabilities allow employees to devote more time to creative activities, problem-solving, and other tasks requiring human judgement. However, the actual impact of AI on productivity depends on employees' technological skills, training opportunities, job characteristics, and willingness to adopt new technologies.

Similarly, managerial decision-making has become increasingly data-driven due to the growing availability of digital information. AI-based analytical systems can process large volumes of data, identify patterns, forecast potential outcomes, and provide insights that assist managers in evaluating alternatives. Such capabilities can improve the speed, consistency, and quality of managerial decisions. Nevertheless, concerns regarding algorithmic bias, data privacy,

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 5, October 2026
Impact Factor: 8.2

transparency, and excessive reliance on automated recommendations highlight the continued importance of human supervision and professional judgement.

The relationship between AI, employee productivity, and managerial decision-making therefore requires systematic investigation. Although AI offers considerable organisational benefits, its successful implementation depends on effective integration with existing business processes, appropriate employee training, ethical governance, and managerial support. Organisations must balance technological advancement with human capabilities to ensure sustainable performance improvements.

Against this background, the present study examines the impact of Artificial Intelligence on employee productivity and managerial decision-making. It seeks to understand how AI adoption influences workplace efficiency, employee performance, and managerial effectiveness while identifying the challenges associated with its implementation. The study aims to provide useful insights for managers, researchers, and organisational policymakers seeking to leverage AI for improved productivity, informed decision-making, and long-term organisational growth.

Research Gap

Although existing research highlights the growing importance of Artificial Intelligence (AI) in organisational management, significant research gaps remain regarding its combined impact on employee productivity and managerial decision-making. Many studies examine AI adoption, workplace automation, or decision-support systems independently, providing limited understanding of how these dimensions interact within organisational settings. Furthermore, insufficient attention has been given to the influence of employee competencies, technological readiness, and organisational support on the effectiveness of AI implementation. The potential challenges associated with algorithmic bias, data privacy, job insecurity, and excessive dependence on AI also require further investigation. Additionally, empirical evidence comparing the perceived benefits of AI with its actual contribution to workplace performance remains limited across different organisational contexts. Therefore, this study seeks to address these gaps by examining AI's implications for employee productivity and managerial decision-making.

Statement of the Research Problem

The increasing adoption of Artificial Intelligence (AI) has significantly transformed organisational operations, employee work practices, and managerial decision-making processes. Although AI technologies offer opportunities to automate routine tasks, enhance operational efficiency, and support data-driven decisions, their actual impact on employee productivity and managerial effectiveness remains a matter of investigation. Organisations face challenges related to employee adaptability, technological competencies, data privacy, algorithmic bias, and dependence on automated systems. Moreover, the implementation of AI does not necessarily guarantee improvements in productivity or decision quality, as outcomes may vary according to organisational readiness, employee acceptance, and the nature of managerial responsibilities. Therefore, the central research problem is to examine how and to what extent the adoption of Artificial Intelligence influences employee productivity and managerial decision-making, while identifying the key benefits, challenges, and organisational factors that determine its effectiveness. The study aims to develop a clearer understanding of AI's role in enhancing organisational performance and supporting effective management practices.

Significance of the Study

The present study is significant as it examines the role of Artificial Intelligence (AI) in improving employee productivity and enhancing managerial decision-making. It provides insights into how AI technologies can automate routine tasks, optimise resource utilisation, reduce operational delays, and support data-driven managerial decisions. The study will help organisations understand the potential benefits and limitations of AI adoption in improving workplace efficiency and organisational performance. It will also assist managers in identifying the importance of employee training, technological readiness, and human–AI collaboration. Furthermore, the study highlights critical

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 5, October 2026
Impact Factor: 8.2

concerns related to data privacy, algorithmic bias, job security, and ethical AI implementation. The findings may benefit researchers, human resource professionals, business managers, and organisational policymakers by supporting informed decisions regarding AI integration and promoting responsible, effective, and sustainable technology adoption in modern workplaces.

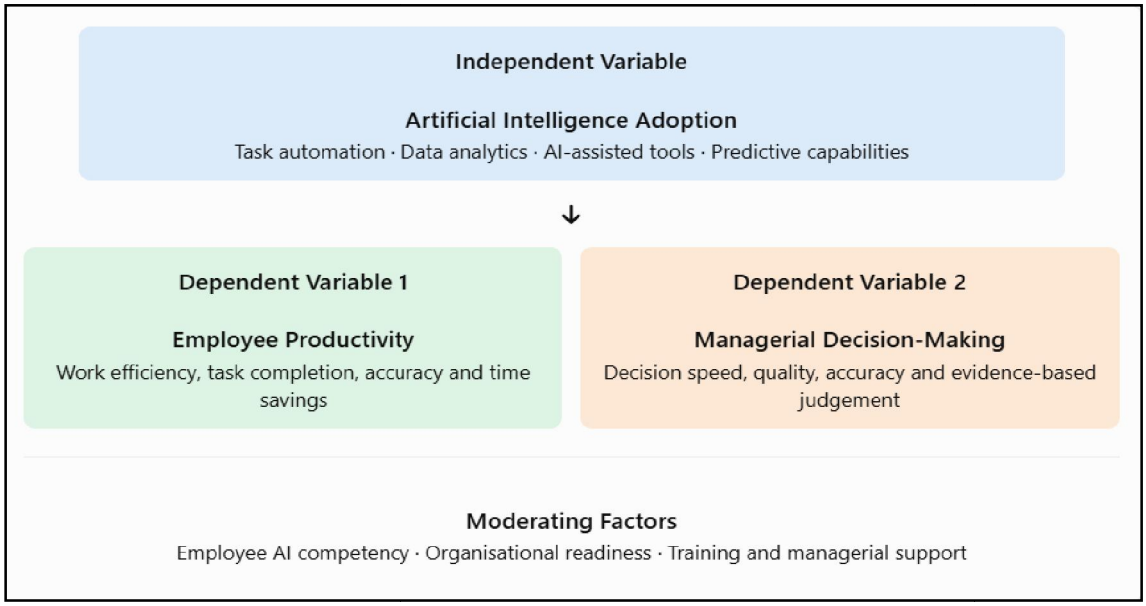
Limitations of the Study

The present study on the impact of Artificial Intelligence (AI) on employee productivity and managerial decision-making has certain limitations. First, the findings may be influenced by the size, composition, and geographical coverage of the sample selected for the research. Second, variations in AI adoption across industries and organisations may affect the generalisability of the results. Third, the study may rely on respondents' perceptions and self-reported information, which could introduce response bias and subjective interpretations. Fourth, the rapid development of AI technologies may limit the long-term applicability of the findings. Fifth, differences in employees' technological competencies, organisational culture, and availability of digital infrastructure may influence the outcomes. Finally, measuring the direct contribution of AI to productivity and decision-making can be challenging because several organisational and human factors may simultaneously affect performance. These limitations should be considered while interpreting the findings and drawing conclusions.

Conceptual Framework

Title: Impact of Artificial Intelligence on Employee Productivity and Managerial Decision-Making

The conceptual framework explains the relationship between Artificial Intelligence (AI) adoption, employee productivity, and managerial decision-making. It proposes that AI adoption influences organisational outcomes by improving task efficiency, information processing, analytical capabilities, and the quality of decisions.



Explanation of the Framework

1. Independent variable: AI adoption represents the extent to which an organisation uses AI-based technologies in routine operations, data analysis, and managerial activities.

2. Dependent variable 1: Employee productivity measures the extent to which AI contributes to improved work efficiency, task accuracy, output, and time utilisation.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429 Volume 6, Issue 5, October 2026 Impact Factor: 8.2

3. Dependent variable 2: Managerial decision-making evaluates the influence of AI on decision speed, information quality, analytical accuracy, and the selection of appropriate alternatives.
4. Moderating factors: Employee competencies, organisational readiness, training, and managerial support may strengthen or weaken the relationship between AI adoption and the two outcome variables.

Proposed Research Hypotheses
H1: Artificial Intelligence adoption has a significant positive impact on employee productivity.
H2: Artificial Intelligence adoption has a significant positive impact on managerial decision-making.
H3: Employee AI competency significantly moderates the relationship between AI adoption and employee productivity.
H4: Organisational readiness and managerial support significantly influence the effectiveness of AI adoption in managerial decision-making.
Research implication: The framework can be tested using a structured questionnaire and quantitative statistical techniques, such as correlation analysis, multiple regression, or Structural Equation Modelling (SEM). The proposed relationships are theoretical and require empirical validation through collected data.
Research Objectives
1. To examine the impact of Artificial Intelligence on employee productivity in terms of work efficiency, task accuracy, and time utilisation.
2. To analyse the influence of Artificial Intelligence on managerial decision-making with reference to decision speed, accuracy, and the quality of data-driven decisions.

Research Hypotheses
1. H_{01} (Null Hypothesis): Artificial Intelligence has no statistically significant impact on employee productivity in terms of work efficiency, task accuracy, and time utilisation.
H_{11} (Alternative Hypothesis): Artificial Intelligence has a statistically significant impact on employee productivity in terms of work efficiency, task accuracy, and time utilisation.
2. H_{02} (Null Hypothesis): Artificial Intelligence has no statistically significant influence on managerial decision-making in terms of decision speed, accuracy, and the quality of data-driven decisions.
H_{12} (Alternative Hypothesis): Artificial Intelligence has a statistically significant influence on managerial decision-making in terms of decision speed, accuracy, and the quality of data-driven decisions.
Note: These hypotheses can be tested using correlation analysis or regression analysis, depending on the research design, measurement scales, and data collected. A significance level of 5% ($p < 0.05$) may be adopted for hypothesis testing.

Review of Literature
1. Acemoglu and Restrepo (2019)
Acemoglu and Restrepo (2019), in their study Automation and New Tasks: How Technology Displaces and Reinstates Labor, examine the effects of technological automation on employment and labour productivity. The authors explain that automation can displace workers from existing tasks while creating opportunities through the introduction of new tasks. Their analysis highlights the importance of balancing technological substitution with the development of new employment opportunities. The study suggests that technological advancement does not necessarily produce uniform benefits for all workers. In the context of the present research, it provides a theoretical foundation for understanding how AI influences employee productivity, job responsibilities, and organisational performance.
2. Brynjolfsson, Li, and Raymond (2025)
Brynjolfsson, Li, and Raymond (2025), in their study Generative AI at Work, investigate the effects of generative AI on employee performance in a real-world customer-support setting. The research demonstrates that access to AI

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429 Volume 6, Issue 5, October 2026 Impact Factor: 8.2

assistance improves worker productivity, with particularly substantial gains among less experienced employees. AI-supported workers benefit from access to guidance and effective practices derived from experienced colleagues. The findings indicate that generative AI can facilitate knowledge transfer, improve task performance, and reduce differences in employee capabilities. This study is directly relevant to the present research because it provides empirical evidence regarding the relationship between AI adoption and employee productivity in organisational settings.

3. Davenport and Ronanki (2018)

Davenport and Ronanki (2018), in their article Artificial Intelligence for the Real World, examine the practical applications of AI in business organisations. The authors identify three major categories of AI implementation: process automation, cognitive insight, and cognitive engagement. They explain that organisations can use AI to automate repetitive activities, analyse large datasets, and improve interactions with customers and employees. The study emphasises the importance of selecting appropriate AI applications based on organisational requirements rather than adopting technology merely for innovation. It also highlights implementation challenges and the need for realistic expectations. This research provides a useful foundation for examining AI's role in employee productivity and managerial decision-making.

4. Jarrahi (2018)

Jarrahi (2018), in the study Artificial Intelligence and the Future of Work: Human-AI Symbiosis in Organizational Decision Making, examines the complementary relationship between human intelligence and artificial intelligence. The author argues that AI can support analytical decision-making by processing information, identifying patterns, and generating predictions, while humans contribute contextual understanding, intuition, creativity, and ethical judgement. The study suggests that effective organisational decision-making depends on combining the analytical capabilities of AI with human expertise. Rather than treating AI as a complete substitute for managers, organisations should develop collaborative decision-making arrangements. This perspective is relevant to the present study because it explains how AI can improve managerial effectiveness while preserving human accountability.

5. Lawrence (1991)

Lawrence (1991), in the study Impacts of Artificial Intelligence on Organizational Decision Making, examines the implications of AI for decision-making within organisational settings. The study contributes to understanding how intelligent systems can influence the processing of information, evaluation of alternatives, and formulation of managerial decisions. AI-supported decision processes have the potential to improve analytical capabilities and assist managers in handling complex information. However, the effectiveness of such systems depends on their appropriate integration into organisational decision-making procedures. The study provides a conceptual basis for investigating the relationship between intelligent technologies and managerial judgement. It is relevant to the present research on AI adoption and managerial decision-making effectiveness.

Research Methodology

1. Research Design

The present study adopts a descriptive and analytical research design to examine the impact of Artificial Intelligence (AI) on employee productivity and managerial decision-making. The descriptive component identifies respondents' perceptions regarding AI adoption, workplace efficiency, task accuracy, and managerial decisions. The analytical component examines the association between AI adoption and the selected research outcomes using the Chi-square test. The study follows a quantitative research approach, as the data will be collected through a structured questionnaire and analysed statistically. The Chi-square test is selected because it helps determine whether statistically significant associations exist between categorical variables.

2. Objectives of the Study

To examine the impact of Artificial Intelligence on employee productivity in terms of work efficiency, task accuracy, and time utilisation.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 5, October 2026
Impact Factor: 8.2

To analyse the influence of Artificial Intelligence on managerial decision-making with reference to decision speed, accuracy, and the quality of data-driven decisions.

3. Population of the Study

The population comprises employees, supervisors, executives, and managers working in organisations where Artificial Intelligence tools are used or where employees have sufficient awareness of AI applications in the workplace.

The respondents may belong to different industries, including banking, education, information technology, finance, manufacturing, retail, and professional services. Including respondents from different occupational backgrounds can help capture varied perceptions of AI adoption and its organisational implications.

4. Sample Size

The study will include 100 respondents selected from the identified population.

A sample size of 100 is proposed for the study, considering the practical requirements of data collection, the scope of the research, and the intended statistical analysis. The adequacy of this sample will also depend on the distribution of responses across categories and the expected frequencies in the Chi-square contingency tables.

5. Sampling Technique

The study may employ convenience sampling, a non-probability sampling technique, to select respondents who are accessible and willing to participate.

Respondents will be selected based on their experience with, exposure to, or awareness of AI applications in organisational activities. Although convenience sampling facilitates data collection, its findings may not be generalisable to the entire population. This limitation will be acknowledged while interpreting the results.

6. Sources of Data

The study will use both primary and secondary sources of data.

Primary data: Primary data will be collected directly from 100 respondents through a structured questionnaire. The questionnaire will include questions relating to AI adoption, employee productivity, managerial decision-making, and respondents' perceptions of AI's organisational benefits.

Secondary data: Secondary data will be obtained from academic journals, research articles, books, industry reports, and credible publications relating to Artificial Intelligence, employee performance, automation, and managerial decision-making.

7. Research Instrument

A structured questionnaire will serve as the principal instrument for collecting primary data. It will contain multiple-choice questions and categorical response options suitable for Chi-square analysis. The questionnaire may be divided into the following sections:

Section	*Particulars*
A	Demographic and professional information
B	AI adoption and usage
C	AI and employee productivity
D	AI and managerial decision-making

For the principal analytical questions, responses should be classified into mutually exclusive categories, such as Yes/No, Improved/Not improved, or High/Moderate/Low, depending on the research question.

If Likert-scale responses are collected, they may be grouped into theoretically justified categories for analysis. However, unnecessary grouping should be avoided because it can reduce information and statistical power.

8. Variables of the Study

The study will examine the following variables:

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 5, October 2026
Impact Factor: 8.2

Variable type	*Variable*	*Illustrative indicators*
Independent variable	AI adoption	Frequency of use, extent of use, workplace integration
Dependent variable 1	Employee productivity	Work efficiency, task accuracy, time utilisation
Dependent variable 2	Managerial decision-making	Decision speed, perceived accuracy, use of data-driven insights
Background variables	Respondent characteristics	Job role, industry, experience, and AI exposure

For Chi-square analysis, these variables must be operationalised as categorical variables. The categories should be defined before data collection and applied consistently.

9. Tools and Techniques for Data Analysis

The collected data will be coded, tabulated, and analysed using Microsoft Excel, SPSS, or another appropriate statistical software package.

The following techniques will be used:

Frequency distribution: To summarise the number of respondents in each response category.

Percentage analysis: To present the proportion of respondents selecting each response.

Cross-tabulation: To examine the distribution of responses across two categorical variables.

Chi-square test of independence: To determine whether a statistically significant association exists between AI adoption and the selected outcome variables.

Chi-square test formula

The Chi-square statistic will be calculated using the following formula:

$$\chi^2 = \sum \frac{(O - E)^2}{E}$$

Where:

χ^2 = Calculated Chi-square statistic

O = Observed frequency

E = Expected frequency

The expected frequency for each cell will be calculated as:

$$E = \frac{\text{Row Total} \times \text{Column Total}}{\text{Grand Total}}$$

The calculated statistic will be compared with the relevant critical value, determined by the degrees of freedom and the selected significance level.

$$df = (r - 1)(c - 1)$$

Here, r represents the number of rows and c represents the number of columns in the contingency table.

10. Formulation of Hypotheses

The following hypotheses correspond to the two research objectives.

Objective 1: AI and employee productivity

H_{01} (Null Hypothesis): There is no statistically significant association between AI adoption and employee productivity.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429 Volume 6, Issue 5, October 2026 Impact Factor: 8.2

H_{11} (Alternative Hypothesis): There is a statistically significant association between AI adoption and employee productivity.

The association may be examined through a cross-tabulation of AI adoption and a categorical measure of employee productivity, such as perceived improvement in work efficiency.

Objective 2: AI and managerial decision-making

H_{02} (Null Hypothesis): There is no statistically significant association between AI adoption and managerial decision-making effectiveness.

H_{12} (Alternative Hypothesis): There is a statistically significant association between AI adoption and managerial decision-making effectiveness.

The association may be examined through a cross-tabulation of AI adoption and a categorical measure of decision-making effectiveness, such as perceived improvement in decision speed or accuracy.

11. Level of Significance and Decision Rule

The study will adopt a 5% level of significance ($\alpha = 0.05$) for hypothesis testing.

The decision rule will be as follows:

If the p-value is less than 0.05, the null hypothesis will be rejected.

If the p-value is equal to or greater than 0.05, the null hypothesis will not be rejected.

The analysis will establish whether a statistically significant association exists between the relevant variables. A significant Chi-square result does not, by itself, establish causation or demonstrate the direction of the relationship.

12. Assumptions of the Chi-square Test

The following assumptions will be considered during data analysis:

The data must consist of frequency counts for categorical variables.

Each respondent must contribute to only one cell in a given contingency table.

Observations should be independent of one another.

Expected cell frequencies must be sufficiently large. As a commonly used guideline, no expected frequency should be below 1, and at least 80% of expected frequencies should be 5 or more.

If the expected-frequency requirements are not satisfied, categories may be combined where theoretically justified, or an appropriate alternative, such as an exact test, may be considered.

13. Reliability and Validity

The questionnaire will be designed to reflect the research objectives and the principal dimensions of AI adoption, employee productivity, and managerial decision-making. Content validity may be assessed through review by subject experts or academic researchers. A pilot study may be conducted with a small group of respondents to identify unclear questions and improve the questionnaire.

The wording of questions and response categories will be kept clear and consistent. Since the principal analysis uses the Chi-square test, the categories used for hypothesis testing must be appropriately defined and consistently coded.

14. Ethical Considerations

Participation in the study will be voluntary. Respondents will be informed about the purpose of the research, and their responses will be treated confidentially. Personal information will be collected only where necessary, and the data will be used exclusively for the stated academic research purposes. The study will avoid disclosing identifiable respondent information in its findings.

15. Scope of Interpretation

The findings will reflect the responses of the 100 selected participants and the associations observed in the collected data. Since convenience sampling may be used, the results should be interpreted with caution. Further, the Chi-square test identifies associations between categorical variables; it does not directly measure the magnitude of AI's impact or establish a causal relationship.

For stronger interpretation, the study may report the Chi-square statistic, degrees of freedom, p-value, and Cramér's V as a measure of association strength.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 5, October 2026
Impact Factor: 8.2

Important methodological recommendation

To ensure that your methodology and statistical analysis remain consistent, the questionnaire should contain at least two clearly defined analytical questions:

One question measuring AI adoption and another measuring perceived employee productivity.

One question measuring AI adoption and another measuring perceived managerial decision-making effectiveness.

These paired variables will allow you to construct two contingency tables and test your two research hypotheses using the Chi-square test.

Data Analysis and Interpretation Using the Chi-Square Test

The data analysis examines the relationship between Artificial Intelligence (AI) adoption, employee productivity, and managerial decision-making. The study considers a sample size of 100 respondents and uses frequency distribution, percentage analysis, cross-tabulation, and the Chi-square test of independence to examine the research hypotheses.

1. Analysis of AI Adoption and Employee Productivity

The first objective examines the association between AI adoption and employee productivity in terms of work efficiency, task accuracy, and time utilisation. For the Chi-square analysis, AI adoption is classified into two categories: regular use and occasional use. Employee productivity is classified according to whether respondents perceive an improvement in productivity.

Table 1: Association Between AI Adoption and Employee Productivity

AI adoption	*Productivity improved*	*No improvement*	*Total*
Regular use	45 (75.0%)	15 (25.0%)	60
Occasional use	20 (50.0%)	20 (50.0%)	40
Total	65	35	100

Interpretation

The distribution indicates that 45 out of 60 respondents who regularly use AI report an improvement in employee productivity, representing 75% of that group. In comparison, 20 out of 40 respondents who use AI occasionally report an improvement, representing 50% of that group.

The distribution suggests a positive association between regular AI use and perceived productivity improvement. However, the difference in percentages alone does not establish statistical significance. The Chi-square test evaluates whether the observed association is statistically significant.

1.1 Calculation of Expected Frequencies

The expected frequency is calculated using the formula:

$$E = \frac{\text{Row Total} \times \text{Column Total}}{\text{Grand Total}}$$

For regular AI use and productivity improvement:

$$E = \frac{60 \times 65}{100} = 39$$

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 5, October 2026
Impact Factor: 8.2

The expected frequencies for all four cells are as follows.

AI adoption	*Productivity improved*	*No improvement*	*Total*
Regular use	39	21	60
Occasional use	26	14	40
Total	65	35	100

1.2 Calculation of the Chi-square Statistic

The Chi-square statistic is calculated using:

$$\chi^2 = \sum \frac{(O - E)^2}{E}$$

Where O represents the observed frequency and E represents the expected frequency.

Cell	*Observed frequency (O)*	*Expected frequency (E)*	$(O - E)^2/E$
Regular use, improved	45	39	0.923
Regular use, no improvement	15	21	1.714
Occasional use, improved	20	26	1.385
Occasional use, no improvement	20	14	2.571
Total	100	100	6.593

Therefore,

$$\chi^2 = 0.923 + 1.714 + 1.385 + 2.571$$

$$\boxed{\chi^2 = 6.593}$$

1.3 Degrees of Freedom and Significance

The degrees of freedom are calculated as:

$$df = (r - 1)(c - 1)$$

$$df = (2 - 1)(2 - 1) = 1$$

At the 5% significance level, the critical Chi-square value for one degree of freedom is 3.841.

Statistical measure	*Result*
Sample size	100
Calculated Chi-square	6.593
Degrees of freedom	1

Copyright to IJARSCT
www.ijarsct.co.in
DOI: 10.48175/IJARSCT-40132

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 5, October 2026
Impact Factor: 8.2

Critical value at 5% significance	3.841
Approximate p-value	0.010
Cramér's V	0.257

1.4 Hypothesis Testing

H_{01}: There is no statistically significant association between AI adoption and employee productivity.

H_{11}: There is a statistically significant association between AI adoption and employee productivity.

The calculated Chi-square value of 6.593 exceeds the critical value of 3.841. The approximate p-value of 0.010 is also below 0.05. Accordingly, the null hypothesis is rejected for this illustrative dataset.

The result indicates a statistically significant association between AI adoption and perceived employee productivity improvement. Cramér's V of approximately 0.257 indicates the strength of the association in this example.

This result does not, by itself, prove that AI causes higher productivity. Other factors, including employee skills, job responsibilities, and organisational support, may also influence productivity.

2. Analysis of AI Adoption and Managerial Decision-Making

The second objective examines the association between AI adoption and managerial decision-making, particularly decision speed, accuracy, and the use of data-driven insights. For the illustrative analysis, managerial decision-making effectiveness is classified into two categories: improved and not improved.

Table 2: Association Between AI Adoption and Managerial Decision-Making

AI adoption	*Decision-making improved*	*No improvement*	*Total*
Regular use	42 (70.0%)	18 (30.0%)	60
Occasional use	18 (45.0%)	22 (55.0%)	40
Total	60	40	100

Percentages are calculated within each AI adoption category.

Interpretation

The data show that 42 out of 60 respondents who regularly use AI report an improvement in managerial decision-making, representing 70% of the group. In comparison, 18 out of 40 respondents who use AI occasionally report an improvement, representing 45% of the group.

This distribution suggests that regular AI use is associated with a higher proportion of respondents reporting improvements in managerial decision-making. The Chi-square test is used to determine whether the observed association is statistically significant.

2.1 Calculation of Expected Frequencies

The expected frequencies are calculated using the formula:

$$E = \frac{\text{Row Total} \times \text{Column Total}}{\text{Grand Total}}$$

For regular AI use and improved decision-making:

$$E = \frac{60 \times 60}{100} = 36$$

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 5, October 2026
Impact Factor: 8.2

The expected frequencies are presented below.

AI adoption	*Decision-making improved*	*No improvement*	*Total*
Regular use	36	24	60
Occasional use	24	16	40
Total	60	40	100

2.2 Calculation of the Chi-square Statistic

The Chi-square statistic is calculated as follows:

$$\chi^2 = \sum \frac{(O - E)^2}{E}$$

Cell	*Observed frequency (O)*	*Expected frequency (E)*	$(O - E)^2/E$
Regular use, improved	42	36	1.000
Regular use, no improvement	18	24	1.500
Occasional use, improved	18	24	1.500
Occasional use, no improvement	22	16	2.250
Total	100	100	6.250

Therefore,

$$\chi^2 = 1.000 + 1.500 + 1.500 + 2.250$$

$$\boxed{\chi^2 = 6.250}$$

2.3 Degrees of Freedom and Significance

The degrees of freedom are:

$$df = (r - 1)(c - 1)$$

$$df = (2 - 1)(2 - 1) = 1$$

The statistical results are summarised below.

Statistical measure	*Result*
Sample size	100
Calculated Chi-square	6.250
Degrees of freedom	1

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 5, October 2026
Impact Factor: 8.2

Critical value at 5% significance	3.841
Approximate p-value	0.012
Cramér's V	0.250

2.4 Hypothesis Testing

H_{02}: There is no statistically significant association between AI adoption and managerial decision-making effectiveness.

H_{12}: There is a statistically significant association between AI adoption and managerial decision-making effectiveness.

The calculated Chi-square value of 6.250 exceeds the critical value of 3.841. The approximate p-value of 0.012 is below the significance threshold of 0.05. Accordingly, the null hypothesis is rejected for this illustrative dataset.

The result indicates a statistically significant association between AI adoption and perceived improvement in managerial decision-making. Cramér's V of 0.250 indicates the strength of this association in the example.

However, the finding does not establish that AI directly causes better managerial decisions. Decision quality may also depend on the reliability of available data, managerial experience, organisational processes, and human supervision.

3. Summary of Hypothesis Testing

The following table consolidates the results of both illustrative Chi-square tests.

Research objective	*Chi-square value*	*df*	*p-value*	*Decision at 5%*
AI adoption and employee productivity	6.593	1	0.010	Reject H_{01}
AI adoption and managerial decision-making	6.250	1	0.012	Reject H_{02}

The values in this table are calculated from the illustrative frequencies presented above and must not be reported as actual survey findings.

4. Overall Interpretation

The analysis demonstrates how the two research objectives can be examined using the Chi-square test of independence. In both examples, the calculated statistics exceed the critical value at the 5% significance level, indicating statistically significant associations between AI adoption and the respective outcome variables.

The employee productivity analysis suggests that regular AI use is associated with a higher proportion of respondents reporting improvements in workplace efficiency and performance. Similarly, the managerial decision-making analysis suggests an association between regular AI use and perceived improvements in decision-making effectiveness.

These results demonstrate the suitability of the Chi-square test for examining relationships between categorical variables. Nevertheless, the final conclusions depend on the actual responses collected from the 100 respondents. The analysis should use the observed frequencies from the completed questionnaire, and the results should be recalculated before the research paper is submitted or published.

Challenges of Artificial Intelligence in Employee Productivity and Managerial Decision-Making

1. Lack of Employee Skills and Training

One of the major challenges in implementing Artificial Intelligence (AI) is the lack of adequate technological skills among employees. Effective use of AI tools requires employees to understand their functions, interpret generated outputs, and integrate them into existing work processes. Employees with limited digital literacy may experience difficulties in adapting to AI-based systems, resulting in errors, resistance, and reduced efficiency. Organisations must therefore invest in continuous training, skill development, and digital awareness programmes. Without appropriate

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429 Volume 6, Issue 5, October 2026 Impact Factor: 8.2

training and managerial support, AI adoption may fail to achieve its intended productivity benefits. Developing employee competencies is essential for effective human–AI collaboration.

2. Data Privacy and Cybersecurity Risks

AI systems frequently process large volumes of organisational, employee, customer, and financial data. This creates significant concerns regarding data privacy, confidentiality, and cybersecurity. Improper data handling, unauthorised access, or security breaches may expose sensitive information and damage organisational reputation. Furthermore, employees may unknowingly share confidential business information with external AI platforms. Such practices can create legal and regulatory risks. Organisations must establish clear data governance policies, implement access controls, and adopt appropriate cybersecurity measures. Responsible data management is necessary to protect stakeholders' interests and maintain trust. Without adequate safeguards, the risks associated with AI adoption may outweigh its operational benefits.

3. Algorithmic Bias and Inaccurate Decisions

AI systems depend on the quality, relevance, and representativeness of the data used to develop or operate them. If the underlying data contains historical biases or incomplete information, AI-generated recommendations may produce inaccurate or discriminatory outcomes. In managerial decision-making, such limitations can affect recruitment, employee evaluation, performance assessment, and resource allocation. AI systems may also generate misleading information or recommendations that appear reliable but lack factual accuracy. Managers should therefore critically evaluate AI-generated outputs rather than accepting them without verification. Regular audits, transparent decision-making procedures, and human oversight are necessary to minimise bias and improve the reliability of AI-supported managerial decisions.

4. Employee Resistance and Job Insecurity

The introduction of AI may create concerns among employees regarding job displacement, reduced job autonomy, and changes in existing responsibilities. Employees who perceive AI as a threat to their employment may resist technological implementation or avoid using AI-based tools. Such resistance can reduce organisational cooperation and delay the achievement of expected productivity improvements. Moreover, excessive dependence on automation may affect employee confidence and opportunities to develop certain professional skills. Organisations should communicate the purpose and implications of AI adoption clearly and involve employees in implementation decisions. Reskilling, redeployment, and transparent human resource policies can help reduce uncertainty and encourage employees to view AI as a supportive tool.

5. Overdependence on AI and Reduced Human Judgement

Although AI can analyse information rapidly and support evidence-based decisions, excessive dependence on automated recommendations may weaken critical thinking and independent managerial judgement. AI systems may fail to recognise contextual factors, ethical considerations, interpersonal relationships, and exceptional circumstances that require human understanding. Managers who rely exclusively on AI-generated outputs may overlook important information or make inappropriate decisions. This challenge is particularly significant in strategic planning, conflict resolution, employee management, and other complex situations. Organisations should adopt a human-in-the-loop approach in which AI provides analytical support while managers retain responsibility for final decisions. Combining technological capabilities with professional experience can improve decision quality and accountability.

Remedies for the Challenges of Artificial Intelligence in Employee Productivity and Managerial Decision-Making

1. Employee Training and Skill Development

Organisations should implement continuous training and development programmes to improve employees' digital literacy and AI-related competencies. Training should focus on the practical use of AI tools, interpretation of AI-generated outputs, data analysis, and the identification of potential errors. Regular workshops, online courses, and hands-on learning sessions can help employees adapt to changing technological requirements. Organisations should also encourage employees to develop critical thinking, creativity, and problem-solving skills that complement AI

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 5, October 2026
Impact Factor: 8.2

capabilities. By investing in employee development, organisations can reduce resistance to technological change, improve workforce adaptability, and maximise the productivity benefits associated with AI adoption.

2. Strengthening Data Privacy and Cybersecurity

Organisations should establish comprehensive data governance policies to ensure the secure and responsible use of AI technologies. Sensitive organisational and employee information must be protected through encryption, access controls, secure storage, and regular cybersecurity assessments. Employees should receive clear guidelines regarding the information that can be shared with external AI platforms. Organisations must also ensure compliance with applicable data protection laws and regulatory requirements. Periodic security audits, incident-response procedures, and vendor assessments can further reduce potential risks. These measures help protect confidential information, strengthen stakeholder confidence, and ensure that AI adoption supports organisational efficiency without compromising privacy or information security.

3. Ensuring Fairness and Accuracy in AI Decisions

Organisations should regularly evaluate AI systems to identify algorithmic bias, inaccurate outputs, and discriminatory outcomes. AI tools should be trained or configured using reliable, relevant, and sufficiently representative data. Managers must independently verify important AI-generated recommendations before using them in employment, financial, or strategic decisions. Regular audits, performance monitoring, and transparent decision-making procedures can improve system reliability. Organisations should also establish clear accountability mechanisms to determine responsibility for errors and adverse outcomes. Combining automated analysis with human judgement can minimise the risk of inappropriate decisions and ensure that AI applications remain consistent with organisational policies, ethical standards, and applicable legal requirements.

4. Reducing Employee Resistance and Job Insecurity

Organisations should adopt a transparent and employee-centred approach to AI implementation. Management must communicate the objectives of AI adoption, its expected benefits, and its potential impact on job responsibilities. Employees should be encouraged to participate in discussions concerning technological changes and workplace processes. Where automation affects existing roles, organisations should provide reskilling, upskilling, and redeployment opportunities wherever feasible. Managers should emphasise that AI can complement human capabilities by reducing repetitive tasks and enabling employees to focus on higher-value activities. Fair human resource policies, continuous communication, and employee involvement can reduce uncertainty, improve acceptance, and support a smoother transition towards AI-enabled workplaces.

5. Maintaining Human Oversight and Managerial Accountability

Organisations should establish clear guidelines specifying when AI-generated recommendations may be used and when human review is necessary. AI should function as a decision-support mechanism rather than an unconditional substitute for managerial judgement. Important decisions involving employee welfare, organisational strategy, financial commitments, and legal compliance should be reviewed by appropriately qualified personnel. Managers should be trained to assess the limitations of AI systems, question unsupported recommendations, and consider ethical and contextual factors. Organisations should also maintain appropriate records of significant AI-assisted decisions and establish accountability procedures. A human-in-the-loop approach can balance technological efficiency with professional judgement, transparency, responsibility, and sound managerial decision-making.

Summary

The effective implementation of Artificial Intelligence requires more than technological investment. Organisations must combine employee training, robust data protection, unbiased algorithms, transparent communication, and human oversight to achieve sustainable improvements in employee productivity and managerial decision-making. These remedies can help organisations maximise the benefits of AI while minimising operational, ethical, and managerial risks.

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 5, October 2026
Impact Factor: 8.2

II. CONCLUSION

Artificial Intelligence (AI) has emerged as an important technological tool for improving employee productivity and supporting managerial decision-making in modern organisations. The present study examines the role of AI in enhancing workplace efficiency, improving task accuracy, reducing time consumption, and supporting data-driven managerial decisions. It highlights the potential of AI technologies to automate repetitive activities, facilitate information processing, and enable employees and managers to focus on more complex and strategic responsibilities.

The study emphasises that AI adoption can contribute to employee productivity by streamlining work processes, reducing manual effort, and improving access to relevant information. Similarly, AI-based analytical tools can assist managers in evaluating alternatives, identifying patterns, and making timely decisions. However, the effectiveness of these technologies depends on employee competencies, organisational readiness, data quality, and the availability of appropriate technological infrastructure.

The Chi-square test of independence provides a suitable statistical method for examining associations between AI adoption and categorical measures of employee productivity and managerial decision-making. The final empirical conclusions depend on the actual responses collected from the 100 respondents. The illustrative analysis presented in this study demonstrates the application of the test but cannot be treated as evidence of actual respondent behaviour without verification against the collected data.

The study also identifies important challenges associated with AI implementation, including data privacy risks, algorithmic bias, employee resistance, skill gaps, and excessive dependence on automated recommendations. Addressing these challenges requires continuous employee training, responsible data governance, transparent organisational policies, and appropriate human supervision.

In conclusion, Artificial Intelligence offers considerable opportunities to improve organisational efficiency and strengthen managerial decision-making when implemented responsibly. Organisations should view AI as a complementary resource that enhances human capabilities rather than as a complete substitute for human judgement. A balanced approach combining technological innovation, employee development, ethical practices, and managerial accountability can support sustainable organisational performance. The study provides a foundation for further empirical research into the relationship between AI adoption, workforce productivity, and managerial effectiveness across different industries and organisational settings.

REFERENCES

1. Acemoglu, D., & Restrepo, P. (2019). Automation and new tasks: How technology displaces and reinstates labor. Journal of Economic Perspectives, 33(2), 3–30. https://doi.org/10.1257/jep.33.2.3

2. Brynjolfsson, E., Li, D., & Raymond, L. R. (2025). Generative AI at work. The Quarterly Journal of Economics, 140(2), 889–942. https://doi.org/10.1093/qje/qjae044

3. Davenport, T. H., & Ronanki, R. (2018). Artificial intelligence for the real world. Harvard Business Review, 96(1), 108–116.

4. Jarrahi, M. H. (2018). Artificial intelligence and the future of work: Human-AI symbiosis in organizational decision making. Business Horizons, 61(4), 577–586. https://doi.org/10.1016/j.bushor.2018.03.007

5. Lawrence, T. (1991). Impacts of artificial intelligence on organizational decision making. Journal of Behavioral Decision Making, 4(3), 195–214. https://doi.org/10.1002/bdm.3960040306

6. Neiroukh, S., Emeagwali, O. L., & Aljuhmani, H. Y. (2025). Artificial intelligence capability and organizational performance: Unraveling the mediating mechanisms of decision-making processes. Management Decision, 63(10), 3501–3532. https://doi.org/10.1108/MD-10-2023-1946

7. Raisch, S., & Krakowski, S. (2021). Artificial intelligence and management: The automation–augmentation paradox. Academy of Management Review, 46(1), 192–210. https://doi.org/10.5465/amr.2018.0072

8. Shrestha, Y. R., Ben-Menahem, S. M., & von Krogh, G. (2019). Organizational decision-making structures in the age of artificial intelligence. California Management Review, 61(4), 66–83. https://doi.org/10.1177/0008125619862257

IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 5, October 2026
Impact Factor: 8.2

9. Noy, S., & Zhang, W. (2023). Experimental evidence on the productivity effects of generative artificial intelligence. Science, 381(6654), 187–192. https://doi.org/10.1126/science.adh2586

10. Giachino, C., Cepel, M., Truant, E., & Bargoni, A. (2025). Artificial intelligence-driven decision making and firm performance: A quantitative approach. Management Decision, 63(10), 3454–3476. https://doi.org/10.1108/MD-10-2023-1966