

A STUDY ON CHALLENGES AND ETHICAL CONCERNS OF ARTIFICIAL INTELLIGENCE IN COMMERCE INDUSTRY

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Abstract:

Artificial Intelligence (AI) is transforming the commerce sector, especially in finance, banking, marketing, customer service, and decision-making. This descriptive study analyses the major challenges and ethical issues of AI implementation in commerce using both primary and secondary data. Primary data were collected through a structured questionnaire from commerce students, academicians, and business professionals using convenience random sampling.

The findings show high awareness of AI applications but highlight concerns about data security, lack of transparency in AI decisions, and possible job displacement. Ethical issues such as algorithmic bias and misuse of consumer data were also identified. The study concludes that responsible and ethical AI implementation is necessary for sustainable growth in the commerce sector, supported by proper regulations, ethical guidelines, and awareness programs.

Keywords: Artificial Intelligence, AI-decision making, Job displacement, Ethical Concerns, Commerce, Business Applications, Adoption of AI

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Introduction:

Artificial Intelligence (AI) has become a significant driving force in the transformation of the commerce sector. From automated accounting and fraud detection to personalized marketing and customer relationship management, AI technologies are increasingly being integrated into commercial operations. Organizations adopt AI to enhance efficiency, improve decision-making, reduce costs, and gain competitive advantage in the market. Despite its growing importance, the adoption of AI in commerce is not free from challenges. Issues such as high implementation costs, lack of skilled professionals, data privacy risks, and over-dependence on technology pose serious concerns for businesses. Moreover, ethical issues related to transparency, algorithmic bias,

Many companies are adopting AI technologies to increase efficiency and gain competitive advantages in the digital market. However, the implementation of AI

also creates several challenges such as high implementation costs, lack of skilled professionals, increased dependency on technology, and concerns related to data security and privacy.

Problem statement:

Artificial Intelligence is increasingly being used in the commerce industry to enhance efficiency, automate processes, and improve customer experience. However, along with these benefits, AI adoption has raised significant challenges and ethical concerns such as privacy risks, lack of transparency in decision-making, algorithmic bias, security issues, and potential job displacement. Many commerce organizations implement AI technologies without adequate ethical frameworks, awareness or regulatory compliance. This creates risks for consumers, employees and businesses and may reduce trust in AI-driven systems. Hence, there is a need to study the challenges and ethical concerns associated with the use of AI in the commerce

industry to promote responsible, fair, and ethical adoption of AI technologies.

Review of Literature:

¹**Alok Reddy, Jakkula (2020)** the rapidly expanding role of AI within the commerce sector, highlighting the pressing ethical considerations that emerge alongside this technological advancement. As AI technologies like machine learning, algorithms, chatbots and predictive analytics become integral to enhancing customer experience, streamlining inventory management, they also raise critical ethical concerns such as data privacy, transparency. This research not only aims to dissect these ethical issues but also to propose frameworks and best practices.

²**Dr. Prithivi S, Dr. B. Saranya, Dr M Suresh, D.M. Anuradha, Dr. D. Paul Dhinakaran, Rajalakshmi (2025)** Examine the primary ethical concerns associated with ai deployment in e-commerce. Analyse the implications of consumer data collection and usage practices. Investigate transparency issues in algorithmic decision-making. Explore the manifestation and impact of algorithmic bias in e-commerce systems. Propose frameworks and recommendations for ethical ai implementation. This paper examines the ethical challenges posed by ai systems in e-commerce, analyses their impact on consumers and businesses, and proposes frameworks for responsible ai implementation.

³**Dr. Kismat Kaur, P. Prasanthi, Dr. A. Kalaivani, Dr. Sundarapandiyam Natarajan, Dr.T. Kannan, M. Rajalakshmi (2024)** This paper explores the transformative impact of Artificial Intelligence (AI)

on the e-commerce industry, examining its applications, implications, and challenges. AI technologies such as personalized recommendations, chatbots, predictive analytics, visual search, dynamic pricing, and supply chain optimization are revolutionizing the way businesses engage with customers, manage operations, and drive growth. These applications enhance customer experience, increase efficiency, and provide competitive advantages.

Objectives of the Study:

- To Know whether there is awareness about AI in commerce industry.
- To understand challenges and ethical concerns of AI
- To Draw the conclusion.
- To suggest measures for responsible and ethical use of AI.

Research Methodology:

The study was conducted using both primary and secondary sources of data. Primary data was collected from 50 respondents consisting of commerce students, academicians, and business professionals residing in Mumbai region through a Google Forms survey titled “A Study on Challenges and Ethical Concerns of Artificial Intelligence in the Commerce Industry.” This data represents immediate, first-hand responses from individuals who have a direct connection with the subject. The responses were gathered through feedback provided in the questionnaire. Secondary data for the research was collected from various sources such as journals, books, magazines, e-journals, newspapers,

¹ Alok Reddy, Jakkula (2020) AI and Ethical Considerations in E-commerce, *Journal of Scientific and Engineering Research*, ResearchGate2020, 7(9):213-216

²Dr. Prithivi S, Dr. B. Saranya, Dr M Suresh, D.M. Anuradha, Dr. D. Paul Dhinakaran, Rajalakshmi (2025) The Ethical Implications Of Ai In E-Commerce: Consumer Data, Transparency, And Algorithmic Bias, *European economic letters vol.15 issue 4 ISSN 2323-5233*

³ Dr. Kismat Kaur, P. Prasanthi, Dr. A. Kalaivani, Dr. Sundarapandiyam Natarajan, Dr.T. Kannan, M. Rajalakshmi (2024) Artificial Intelligence In E-Commerce: Applications, Implications, And Challenges, *ResearchGate vol. 76 ISSN: 0387-5695*

internet sources, and relevant websites to support and supplement the primary findings.

The research adopted a descriptive and analytical research design using a Likert scale to measure respondents' opinions and perceptions. A non-probability convenience sampling method was used to select the participants for the study. For the analysis and presentation of data, tools such as tables, graphs, and pie diagrams and Chi square testing method were used to interpret and illustrate the findings effectively.

Hypothesis:

H0 – There is no significant relationship between Age and Challenges of AI in the Commerce Industry.

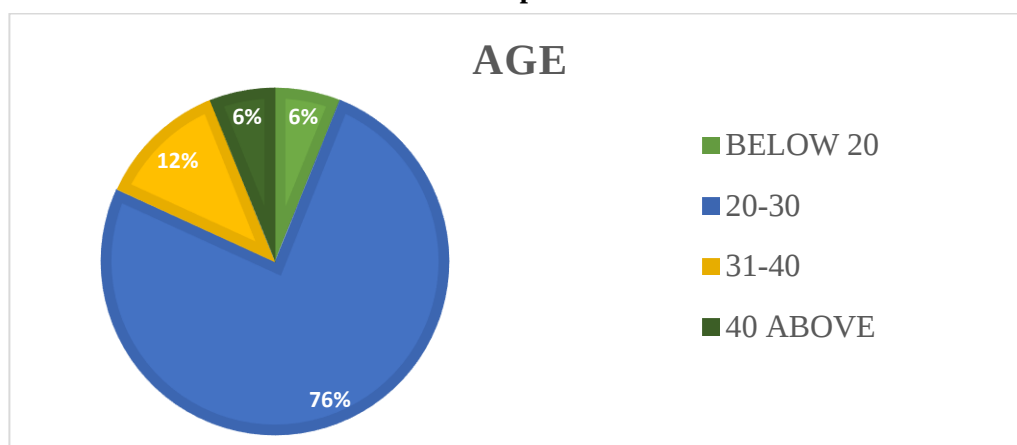
H1 - There is a significant relationship between Age and Challenges of AI in the Commerce Industry.

Demographic Profile:

Limitations of the study:

- The study is limited to selected respondents from the commerce industry; therefore, the findings may not represent all sectors or regions.
- The research relies on primary data collected through questionnaire/interviews, which may be affected by respondents' personal opinions and bias
- The study focuses only on challenges and ethical concerns of AI and does not deeply analyze the technical aspects of AI systems.
- Rapid changes in AI technology and regulations may make some findings relevant only for a limited period
- Time constraints may restrict the depth of analysis and sample size of the study

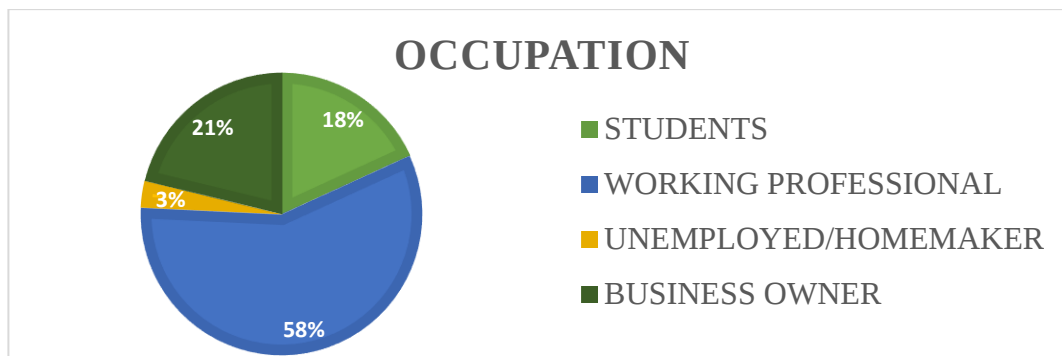
Graph 1



(Source: Primary Data)

The 25 respondents consist of young age group that is 20 years to 30 years age (76%) followed by 4 respondents aged 31 years to 40 years (12%), 2 respondents above 40 years of age (6%) and lastly 2 respondents below 20 years age (6%).

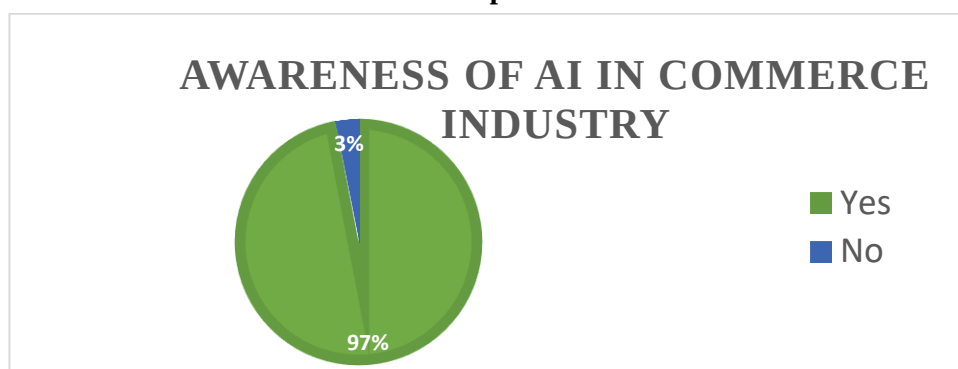
Graph 2



(Source: Primary Data)

Out of 33 respondents 19 respondents (56%) belong to working professional category, 7 respondents (21%) belong to students category, 6 respondents (18%) belong to Business profession and 1 respondent belong to Unemployed Category.

Graph 3

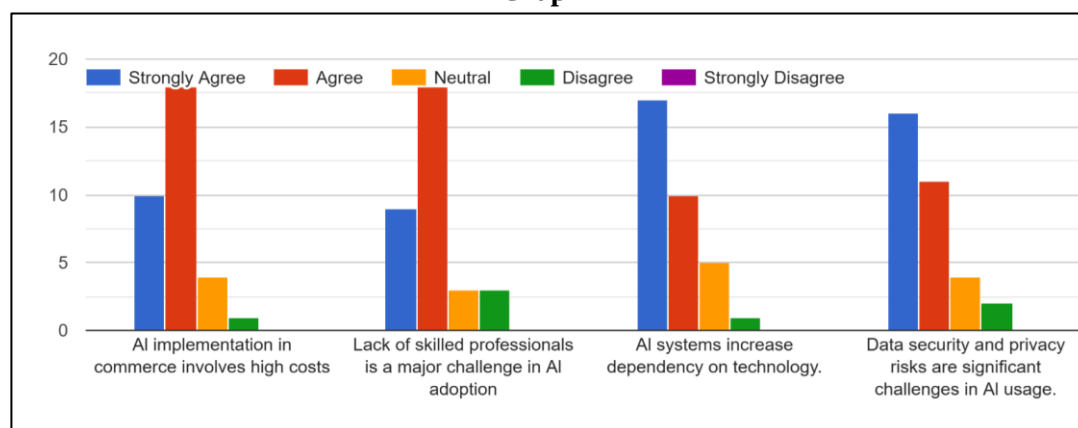


(Source: Primary Data)

Out of 33 respondents (97%) 32 Respondents are aware about the Artificial Intelligence in Commerce industry where major respondents are young aged from working professional and Students category.

Challenges of AI in Commerce:

Graph 4



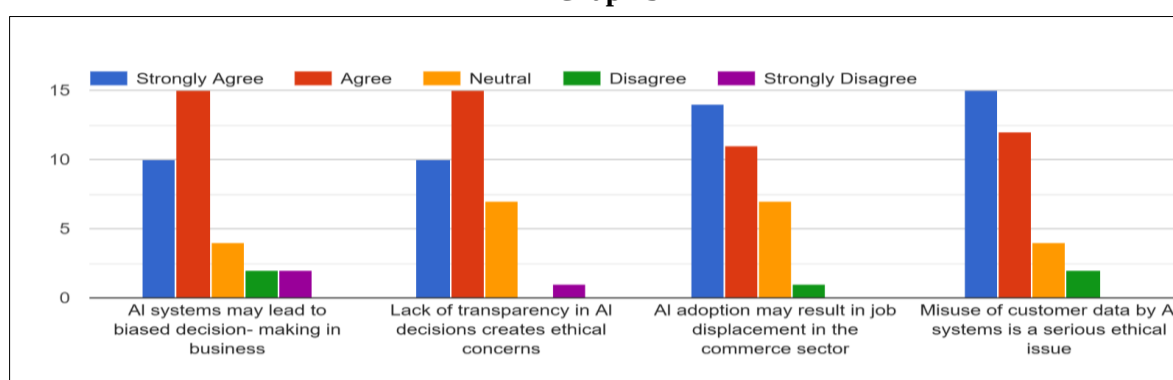
(Source: Primary Data)

Most respondents agree or strongly agree that AI implementation involves high costs and that the lack of skilled professionals is a major challenge. A large number also believe that AI systems increase dependency on technology, with many strongly agreeing with this statement. Additionally, many respondents feel that data security and privacy risks are significant challenges in AI usage.

Overall, the responses indicate that people generally recognize several important challenges in adopting AI in commerce, especially cost, skill shortage, technological dependency, and security concerns.

Ethical Concerns of AI:

Graph 5



(Source: Primary Data)

The chart shows respondents' views on ethical issues related to AI in the commerce sector. Most respondents agree or strongly agree that AI systems may lead to biased decision-making in business. Many also agree that lack of transparency in AI decisions creates ethical concerns. A large number of respondents believe that AI adoption may result in job displacement in the commerce sector. Additionally, most respondents feel that misuse of customer data by AI systems is a serious ethical issue.

Overall, the results indicate that respondents are concerned about ethical risks of AI, especially bias, lack of transparency, job loss, and misuse of customer data.

Hypothesis:

H0 – There is no significant relationship between Age and various challenges of AI in Commerce Industry

H1 - There is significant relationship between Age and various challenges of AI in Commerce Industry

Sr. No .	Challenges of AI in Commerce	Chi-Square Value (χ^2)	Degrees of Freedom (df)	p-value	Level of Significance	Result
1	AI implementation involves high costs	10.01	9	0.350	0.05	Not Significant
2	Lack of skilled professionals	9.22	9	0.417	0.05	Not Significant
3	AI increases dependency on technology	11.44	9	0.247	0.05	Not Significant
4	Data security and privacy risks	19.97	9	0.018	0.05	Significant

Decision Rule:

- If $p\text{-value} < 0.05 \rightarrow \text{Reject } H_0$
- If $p\text{-value} > 0.05 \rightarrow \text{Accept } H_0$

1. AI Implementation Involves High Costs

The Chi-square test shows no significant relationship between age and the perception that AI implementation involves high costs ($p = 0.350 > 0.05$). Thus, respondents of different age groups have similar opinions on this challenge.

2. Lack of Skilled Professionals

The analysis indicates no significant relationship between age and the lack of skilled professionals in AI ($p = 0.417 > 0.05$). Therefore, different age groups share similar views regarding this issue.

3. AI Increases Dependency on Technology

The Chi-square test reveals no significant association between age and the belief that AI increases dependency on technology ($p = 0.247 > 0.05$). Hence, respondents across age groups think similarly about this challenge.

1. Data Security and Privacy Risks

The results show a significant relationship between age and concerns about data security and privacy risks ($p = 0.018 < 0.05$). This means different age groups perceive this challenge differently.

The Chi-square test results show that for most AI challenges (high cost, lack of skilled professionals, and dependency on technology), the p-values are greater than 0.05, so the null hypothesis is accepted, indicating no significant relationship with age.

However, for data security and privacy risks, the p-value is less than 0.05, so the null hypothesis is rejected. This means age influences concerns about data security, but not the other AI challenges in commerce.

Conclusion:

Artificial Intelligence is playing a significant role in transforming the commerce industry by improving efficiency, decision-making, and customer experience. The study shows that respondents have a high level of awareness about AI and its applications in commerce. However, along with its advantages, AI also brings several challenges and ethical concerns such as data privacy risks, algorithmic bias, lack of transparency, and possible job displacement.

Therefore, it is important for organizations, policymakers, and stakeholders to focus on responsible and ethical implementation of AI technologies. Proper regulations, ethical frameworks, and human supervision are necessary to ensure that AI is used in a fair, transparent, and beneficial way for businesses as well as society.

Recommendations/Suggestions:

- Organizations should develop ethical guidelines and policies for the responsible use of Artificial Intelligence.
- Companies should ensure strong data protection and cybersecurity measures to protect consumer information.
- Proper training and skill development programs should be provided to employees to adapt to AI technologies.
- Government and regulatory bodies should create clear laws and regulation for AI usage in commerce.
- Human supervision should always be included in important AI-based decisions.
- Awareness programs and educational initiatives should be introduced to help people understand the benefits and risks of AI.

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