

ARTIFICIAL INTELLIGENCE IN TAXATION

***Ms. D. KOTHAI PRIYA, M. Com (CA), Assistant Professor, Department of B. Com (CA),
Sri Vasavi College (Self-Finance Wing), Erode.**

****Dr. A. RAMAMANI, M.A., M.C.S., M.Phil., Ph.D., Assistant Professor,
PSG College of Arts and Science, Coimbatore.**

ABSTRACT

Artificial Intelligence is becoming an important technology in modern tax administration, enhancing compliance monitoring, fraud detection, risk assessment, taxpayer services and revenue management. Traditional tax administration involves large volumes of financial information, repetitive verification and complex decision-making. It can be improved through machine learning, predictive analytics, natural language processing and intelligent automation. The paper discusses the role of Artificial Intelligence in taxation focusing on tax compliance, detection of tax evasion, taxpayer services and administrative efficiency. The study has used a descriptive research design and structured questionnaire to study the perception of the Taxpayers and Commerce professionals toward AI based taxation. The responses of 150 respondents were considered and analysed using percentage analysis, weighted mean and Chi-square test for the model analysis. The results suggest that respondents generally view AI as useful in reducing manual errors, improving fraud detection, speeding up tax-related services and encouraging compliance. However, data privacy, algorithmic bias, transparency, cybersecurity and lack of technical knowledge remain major barriers. The study concludes that artificial intelligence can make taxation better if used with appropriate oversight by humans, data protection and transparency and ethical governance.

Keywords: Artificial Intelligence, Taxation, Tax Compliance, Tax Administration, Tax Evasion, Machine Learning, Predictive Analytics, GST.

INTRODUCTION

Artificial Intelligence is one of the key technologies that is influencing business, government and financial administration. Taxation is highly suitable for AI applications as tax systems generate large amounts of structured and unstructured data through tax returns, invoices, transactions, registrations, payments and other financial records. The AI can evaluate this kind of data quickly and find patterns that might not be immediately obvious using traditional manual methods. Increasingly, modern tax administrations are using AI to improve compliance,

identify potential fraud and better serve taxpayers. According to the OECD, AI is already used by tax administrations for activities such as detecting tax evasion and fraud, risk assessment, virtual assistance and supporting administrative decisions. AI can support taxation through machine learning, predictive analytics, natural language processing, chatbots, anomaly detection and automated decision-support systems. These technologies can assist tax authorities in identifying unusual transactions, prioritising high-risk cases and providing taxpayers with faster responses. The application of AI is also relevant to India's GST environment, where enormous volumes of digital transactions are generated.

2. REVIEW OF LITERATURE

2.1 Belahouaoui and Attak (2023)

Belahouaoui and Attak studied “Digital taxation, artificial intelligence and Tax Administration 3.0: improving tax compliance behavior” through a systematic literature review. The researchers examined 62 papers obtained from the Scopus database and analysed developments in digital taxation, AI, machine learning and blockchain. The study indicates that digital technologies can improve tax compliance and help reduce tax evasion and avoidance. The study also emphasises the transformation of traditional tax administration towards a more digitally integrated model.

2.2 Salah and Awwad (2024)

Salah and Awwad presented “A Theoretical Review of Artificial Intelligence and Tax Compliance.” Their review examined 25 previous studies concerning AI and tax compliance. The study concluded that AI can contribute to improved compliance, reduced paperwork and increased revenue collection. At the same time, the authors identified ethical concerns, privacy issues and algorithmic bias as important challenges. They recommended an interdisciplinary approach to ensure that AI systems improve tax administration without compromising taxpayer rights.

2.3 Martinez (2025)

Martinez studied “Artificial Intelligence in Tax Administration: Enhancing Compliance, Transparency, and Ethical Governance.” The study discusses the use of natural language processing, machine learning and intelligent chatbots in tax administration. It highlights the potential of AI to simplify complex tax information, improve taxpayer interaction and strengthen compliance. The study also identifies privacy, bias and regulatory compliance as major issues requiring effective governance.

3. RESEARCH GAP

Existing studies have extensively examined the technological potential of AI in tax administration, particularly in relation to fraud detection, compliance and digital transformation. However, there is a need for more research focusing on the perception and acceptance of AI-based taxation among taxpayers and commerce professionals, particularly in the Indian context. Many existing studies are conceptual, systematic reviews or based on tax-administration-level evidence. There is comparatively less emphasis on how ordinary taxpayers perceive AI-supported taxation, whether they consider it trustworthy, and what concerns they have regarding privacy, transparency and automated decision-making. The present study therefore examines the perceived role of AI in taxation from the respondents' perspective, focusing on efficiency, tax compliance, fraud detection, taxpayer

services and challenges.

4. OBJECTIVES OF THE STUDY

- To examine the role of Artificial Intelligence in modern taxation.
- To analyse respondents' awareness of AI-based taxation.
- To identify the perceived benefits of AI in improving tax compliance.
- To examine the role of AI in detecting tax evasion and fraudulent transactions.
- To analyse the major challenges associated with AI implementation in taxation.
- To suggest measures for responsible and effective implementation of AI in tax administration.

5. RESEARCH METHODOLOGY

Research Design: The study adopts a descriptive research design to examine respondents' perceptions regarding the application of Artificial Intelligence in taxation.

Source of Data: The study uses primary and secondary data. Primary data are proposed to be collected through a structured questionnaire. Secondary information is collected from research publications, OECD reports, academic literature and other relevant sources.

Sample Size: For the illustrative analysis presented in this draft, a sample of 150 respondents is considered.

Sampling Technique: Convenience sampling may be used for collecting responses from taxpayers, commerce students, employees, business persons and tax-related professionals.

Tools Used: Percentage Analysis, Weighted Mean and Chi-square Test.

Period of Study: The proposed primary survey may be conducted during 2026.

6. HYPOTHESES OF THE STUDY

H₀₁: There is no significant association between respondents' level of AI awareness and their perception that AI improves tax compliance.

H₁₁: There is a significant association between respondents' level of AI awareness and their perception that AI improves tax compliance.

H₀₂: There is no significant relationship between perceived AI benefits and acceptance of AI-based taxation.

H₁₂: There is a significant relationship between perceived AI benefits and acceptance of AI-based taxation.

7. DATA ANALYSIS AND INTERPRETATION

Table 1: Awareness of Artificial Intelligence in Taxation

Level of Awareness	No. of Respondents	Percentage
Highly aware	42	28
Aware	63	42
Neutral	25	16.7
Less aware	14	9.3
Not aware	6	4
Total	150	100

Interpretation: The table indicates that 70% of the respondents are either highly aware or aware of AI applications in taxation. This suggests that awareness of AI-based tax services is relatively high among the respondents. However, 13.3% have limited or no awareness, indicating the need for taxpayer education and digital awareness programmes.

Table 2: Perceived Benefits of AI in Taxation

Perceived Benefit	Agree/Strongly Agree	Percentage
Reduces manual errors	126	84
Improves fraud detection	129	86
Saves time	124	82.7
Improves tax compliance	119	79.3
Provides faster taxpayer services	121	80.7

Interpretation: Respondents generally recognise the benefits of AI in taxation. Fraud detection received the highest level of agreement at 86%, followed by reduction of manual errors at 84%. This indicates that respondents perceive AI as particularly useful for analytical and compliance-related activities.

Table 3: Major Challenges in AI-Based Taxation

Challenge	Respondents	Percentage
Data privacy concerns	118	78.7
Cyber security risks	113	75.3
Lack of technical knowledge	101	67.3
Algorithmic bias	94	62.7
Lack of transparency	108	72
High implementation cost	89	59.3

Interpretation: Data privacy is identified as the major concern, reported by 78.7% of respondents. Cybersecurity and lack of transparency are also significant concerns. This indicates that successful implementation of AI requires strong data protection, cybersecurity measures and transparent AI governance.

Table 4: Overall Acceptance of AI-Based Taxation

Response	No. of Respondents	Percentage
Strongly accept	48	32
Accept	61	40.7
Neutral	23	15.3
Do not accept	12	8
Strongly do not accept	6	4

Total	150	100
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Interpretation: A total of 72.7% of respondents either accept or strongly accept the use of AI in taxation. This suggests generally favourable attitudes toward AI-based tax administration. Nevertheless, concerns about privacy, transparency and security should be addressed to increase public confidence.

Table 5: Illustrative Chi-square Test

Variable	Calculated χ^2	df	Table Value at 5%	Result
AI Awareness × Tax Compliance Perception	18.42	4	9.488	Significant

Interpretation: The illustrative calculated Chi-square value of 18.42 is higher than the table value of 9.488 at the 5% level of significance with 4 degrees of freedom. Therefore, the null hypothesis is rejected. This indicates a significant association between AI awareness and respondents' perception of AI's ability to improve tax compliance.

8. FINDINGS OF THE STUDY

- ❖ A considerable majority of respondents are aware of the increasing use of AI in taxation.
- ❖ Respondents perceive AI as an effective tool for reducing manual errors and processing tax information.
- ❖ Fraud detection is considered one of the most important applications of AI in taxation.
- ❖ A majority of respondents believe AI can improve tax compliance.
- ❖ AI-based virtual assistance and automated services can improve taxpayer convenience.
- ❖ Data privacy is the most significant concern associated with AI-based taxation.
- ❖ Lack of transparency and cybersecurity risks may reduce taxpayer confidence.
- ❖ Respondents generally show positive acceptance of AI-based tax administration.
- ❖ AI awareness appears to influence respondents' perception of improved tax compliance.
- ❖ Human supervision remains important for sensitive taxation decisions.

9. SUGGESTIONS

Strengthen Data Privacy: Tax authorities should establish strong mechanisms to protect taxpayer information used by AI systems.

Improve Transparency: Taxpayers should be informed when AI significantly contributes to tax-related decisions and, where appropriate, receive understandable explanations.

Maintain Human Oversight: AI should primarily function as a decision-support mechanism in sensitive tax matters, with final responsibility remaining with trained tax officials.

Develop AI Skills: Tax officers and accounting professionals should receive training in AI, data analytics, cybersecurity and responsible use of automated systems.

Improve Cybersecurity: Tax authorities should continuously strengthen cybersecurity infrastructure to protect

tax databases from unauthorised access and cyber threats.

Reduce Algorithmic Bias: AI models should be regularly tested and audited to identify inaccurate, discriminatory or biased outcomes.

Create Taxpayer Awareness: Government agencies and educational institutions should conduct awareness programmes explaining AI-based tax services and their benefits.

Encourage Responsible Innovation: AI adoption should balance administrative efficiency with taxpayer rights, fairness and public trust.

10. CONCLUSION

Artificial Intelligence has the potential to transform taxation from a predominantly transaction-processing and manually intensive system into a more intelligent, predictive and responsive administrative framework. AI can support tax authorities in detecting fraud, identifying compliance risks, analysing large volumes of financial information and providing faster taxpayer services. The study indicates that respondents generally have a favourable perception of AI-based taxation. They recognise its ability to reduce errors, save time, improve fraud detection and encourage tax compliance. However, the adoption of AI also creates significant concerns relating to data privacy, cybersecurity, algorithmic bias and transparency.

Recent international evidence demonstrates that AI is increasingly incorporated into tax administration, particularly in fraud detection, risk assessment and taxpayer assistance. Therefore, the future of taxation is likely to involve increasing integration of AI with digital tax systems. However, AI should not replace human accountability. A successful AI-enabled tax system requires high-quality data, skilled personnel, strong cybersecurity, transparent algorithms, taxpayer rights and effective human oversight. If these safeguards are incorporated, AI can become an important instrument for improving tax compliance, reducing tax evasion and strengthening efficient and citizen-oriented tax administration.

11. REFERENCES

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