IMPROVING MANAGEMENT MECHANISMS IN TAX AUTHORITIES THROUGH ARTIFICIAL INTELLIGENCE UNDER DIGITAL TRANSFORMATION

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Abstract

This article examines how artificial intelligence can improve management mechanisms in tax authorities under conditions of digital transformation. Recent international evidence shows that tax administrations are moving beyond basic electronic services toward data-driven compliance management, digital identity systems, advanced analytics, and AI-supported taxpayer services. OECD materials report that artificial intelligence is already used by more than 70% of tax administrations, with the most common applications involving the detection of tax evasion and fraud, risk-assessment processes, and virtual assistants. IMF and World Bank publications likewise present AI as a strategic instrument for tax and revenue administrations, while emphasizing that its effectiveness depends on governance, skills, legal safeguards, and institutional readiness. On this basis, the article argues that AI can strengthen management mechanisms in tax authorities most effectively when it is integrated into a broader digital-transformation architecture built on interoperable data, accountable decision-making, taxpayer-rights protection, and continuous monitoring. [1], [3], [4], [9].

Keywords: artificial intelligence, tax administration, tax authorities, digital transformation, public management, compliance risk management, taxpayer services,

public governance, digital government.

Introduction

Digital transformation has become a central element of modern tax administration because taxation is increasingly delivered through online interactions, digital identities, interoperable data systems, and analytics-based processes. The OECD explains that the overall aim of this transformation is to make taxation easier and less costly for taxpayers and to reduce avoidable compliance burdens for individuals and businesses. In this environment, management in tax authorities can no longer rely only on traditional hierarchical routines and manual control mechanisms; it increasingly depends on digital tools that support faster, more accurate, and more integrated decision-making. [1], [2].

Artificial intelligence has emerged as one of the most important technologies in this process. The OECD reports that more than 70% of tax administrations use AI to improve effectiveness and efficiency, especially in compliance management and taxpayer services, and identifies the detection of tax evasion and fraud, risk assessment, and virtual assistants as the most common use cases. The IMF's 2024 technical note likewise treats AI in tax and customs administration as a matter of current strategic importance for planning and managerial decision-making. [1], [3].

The purpose of this article is to analyze how artificial intelligence can improve management mechanisms in tax authorities under digital transformation. The article focuses on three tasks: first, reviewing major scholarly and institutional contributions; second, identifying the main management functions in which AI creates value; and third, proposing development directions for more effective, transparent, and accountable tax administration. [1], [3], [4].

Literature Review

The academic and institutional literature on AI in tax administration has developed along three major lines: managerial efficiency and compliance improvement,

taxpayer-rights and legality concerns, and broader institutional design for responsible AI deployment. OECD and IMF publications focus mainly on strategic transformation and practical use cases, while legal and applied research examines explainability, rule-of-law demands, and the legitimacy of algorithmic administration in taxation. [1], [3], [6], [9].

A key scholarly contribution is the work of Faúndez-Ugalde, Mellado-Silva, and Aldunate-Lizana (2020), which examines taxpayers' rights to access the algorithms and formulas used by tax administrations in Latin America, especially in taxpayer-risk characterization and the robotization of tax-audit actions. This study is important because it shows that AI in taxation is not merely an administrative efficiency tool; it also raises questions about transparency, legal access, and the right of defense. [5].

A complementary public-law perspective is offered by Daly (2024), who analyzes AI in taxation through the lens of the rule of law. Daly argues that taxation provides a particularly useful case study for examining legality, accountability, certainty, and the relationship between automated administration and public authority. The significance of this work lies in showing that AI in tax administration must be assessed not only in terms of productivity gains but also in light of the legal values that govern relations between the state and taxpayers. [6].

A more operational perspective appears in Koivula (2024), who explored whether deep learning, neural networks, and self-organizing maps could add value in the Finnish Tax Administration in handling income-tax-related claims by limited liability companies. The study found that such tools could function as knowledge-creation instruments for administrative work, though not as unrestricted substitutes for legal judgment. Górski (2025) further develops this line by examining whether explainable AI techniques can address taxpayer concerns about how AI-based tax decisions are made and whether those decisions comply with legal procedures. [7], [8].

Analysis and Results

1. AI as a tool for improving core management mechanisms

Under digital transformation, the management mechanisms of tax authorities are changing from reactive, paperwork-based administration toward proactive, data-led governance. In this environment, AI contributes first to compliance risk management. OECD evidence shows that tax authorities use AI most commonly for detecting tax evasion and fraud and for risk assessment. This means that management can move from broad, resource-intensive control toward more targeted intervention, better case prioritization, and more efficient allocation of audit capacity. [1], [9].

A second major contribution is in taxpayer service management. OECD data identifies virtual assistants as one of the most common AI applications in tax administration. From a management perspective, this allows tax authorities to redesign front-office functions, reduce repetitive workloads for staff, deliver faster answers to taxpayers, and create more personalized service channels. Such changes are highly relevant in digital transformation because the quality of taxpayer interaction increasingly becomes a management-performance indicator, not only a service issue. [1], [2].

A third contribution lies in internal process management and organizational intelligence. AI can support document analysis, triage, anomaly detection, forecasting, and claims handling. The World Bank's strategic AI integration model for revenue administrations and Koivula's work on Finnish tax procedures both suggest that AI can add administrative value by improving internal knowledge creation and process design rather than merely automating isolated tasks. This means that management mechanisms become more analytical, evidence-based, and capable of learning from data over time. [4], [7].

Table 1.

Main Management Mechanisms Improved by AI in Tax Authorities

Management mechanism	AI-supported function	Expected managerial effect

Compliance management	Risk scoring, fraud detection, anomaly recognition	Better targeting of audits and enforcement actions
Taxpayer service management	Virtual assistants, automated guidance, service personalization	Faster service delivery and lower administrative burdens
Internal workflow management	Document triage, claims handling, prioritization	Greater efficiency and more consistent internal operations
Strategic planning	Forecasting, pattern analysis, managerial dashboards	Better resource allocation and planning quality
Knowledge management	Data mining, decision support, case clustering	Stronger institutional learning and decision support

Source: author's synthesis based on OECD, IMF, World Bank, and scholarly materials. [1], [3], [4], [7], [9].

2. Legal and governance conditions for management improvement

The literature makes clear that AI improves management only when it is embedded in strong governance arrangements. The IMF technical note stresses legal and ethical concerns, guidance for responsible use, and methods for risk-assessing AI use cases. The OECD's work on governing with AI in tax administration likewise emphasizes that tax administration is a particularly demanding environment because it requires data protection, protection of taxpayer rights, and preservation of taxpayer trust. [3], [9].

This point is especially important because management decisions in tax authorities can directly affect audits, risk flags, service outcomes, and the taxpayer's ability to challenge administrative action. OECD materials warn that inadequate or skewed data, lack of transparency, and limited explainability can lead to flawed risk

models, improper targeting of taxpayers, and reduced trust in government. The report also points to well-known failures such as the Dutch childcare benefits scandal as a warning about algorithmic error in public administration. [9].

As a result, AI-based management improvement in tax authorities must be accompanied by data governance, transparency, explainability, human oversight, and accountability mechanisms. Legal scholarship supports this conclusion: Faúndez-Ugalde highlights taxpayer access and defense rights, Daly emphasizes legality and accountability, and Górski stresses the need for explanation mechanisms that meet taxpayer and legal expectations. In other words, management reform through AI cannot be separated from public-law safeguards. [5], [6], [8], [9].

3. Institutional readiness and capability development

Another critical factor is institutional readiness. OECD reporting shows that tax administrations need stronger digital, data, and cybersecurity capabilities and that staff skills are being reshaped by digital transformation. The OECD also notes implementation challenges such as competition for skilled workers, high costs of adoption, and inflexible legal and regulatory environments. The IMF note similarly frames AI as a topic for senior decision-makers, not only technical specialists. [1], [3], [9].

This means that the improvement of management mechanisms in tax authorities depends not only on acquiring AI tools, but on organizational redesign, training, and change management. A tax authority may have strong technical pilots, but without institutional alignment those pilots remain fragmented. The World Bank's strategic integration model is particularly useful here because it treats AI adoption as a management issue involving governance structures, operational design, and implementation pathways rather than just software deployment. [4].

Table 2.

Key Preconditions for Effective AI-Based Management in Tax Authorities

Precondition	Why it matters	Management implication
High-quality data	AI outcomes depend on accurate, complete, and current data	Requires strong data cleaning, validation, and updating processes
Legal safeguards	Taxpayers must be able to understand and challenge administrative action	Requires transparent procedures and documented decision paths
Skilled workforce	AI deployment changes skill needs in tax authorities	Requires training, recruitment, and change management
Institutional governance	AI affects multiple departments and processes	Requires cross-functional coordination and clear accountability
Human oversight	Fully opaque automation can undermine legality and trust	Requires managerial review and override capacity

Source: author's synthesis based on OECD, IMF, and legal scholarship. [3], [5], [6], [8], [9].

4. Development prospects

The future development of AI-based management in tax authorities is likely to move in four main directions. The first is deeper integration into digital tax ecosystems, where AI is embedded in taxpayer portals, digital identity systems, and real-time compliance infrastructures. The second is more advanced compliance analytics, enabling increasingly preventive and targeted intervention. The third is greater emphasis on explainability and trust, driven by legal and ethical concerns and by the central role of public confidence in tax compliance. The fourth is a more systemic management approach, where AI is not treated as a separate innovation but as part of

the operating model of the tax authority. [1], [2], [3], [9].

The OECD explicitly states that tax administrations should adopt a systemic approach to AI, treating it as an integrated component embedded in regulatory frameworks, organizational structures, technical infrastructures, and human expertise. It also notes the relevance of Rules as Code as a way to encode legal rules into machine-readable formats, which may improve consistency and transparency in AI-supported decision making. This development prospect is especially important for management reform because it links AI not only to administrative efficiency but also to better rule implementation. [9].

Conclusion

The analysis shows that artificial intelligence can significantly improve management mechanisms in tax authorities under digital transformation. Its strongest contributions appear in compliance risk management, taxpayer service delivery, internal workflow management, and strategic planning. OECD, IMF, and World Bank materials all indicate that AI is becoming a strategic component of modern revenue administration rather than a marginal technical experiment.

At the same time, the literature also shows that AI does not improve management automatically. The long-term success of AI in tax authorities depends on data quality, legal safeguards, organizational capability, transparency, explainability, and taxpayer trust. In this sense, the most promising path is not uncontrolled automation, but a balanced model in which AI is integrated into tax administration as a lawful, reviewable, and strategically governed instrument of public management.

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