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Digital Transformation and Tax Compliance Enhancement: A Comparative Analysis of HMRC and Global Tax Authorities

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Abstract – Despite numerous reforms by tax authorities, the persistent challenge of low tax compliance and administrative inefficiencies continues to undermine effective revenue generation globally. This study examines the effect of digital transformation tools on tax compliance rates and operational efficiency, drawing insights from HMRC in the United Kingdom and global tax authorities. Using a survey research design with data from 91 respondents actively engaged in the tax system, the study employed descriptive statistics and regression analysis to test specific relationships between digital transformation components and compliance outcomes. Findings reveal that taxpayers perceive digital tax platforms as user-friendly, transparent, and cost-effective in reducing administrative burdens. The regression models demonstrate that AI-based compliance checks and digital payment platforms significantly enhance compliance rates and improve operational efficiency, while online filing systems show limited direct impact. These outcomes highlight the transformative role of advanced digital technologies in strengthening tax systems.

Keywords - Digital Transformation, Tax Compliance, Operational Efficiency, AI-Based Compliance Checks, Digital Payment Platforms, Online Filing Systems.

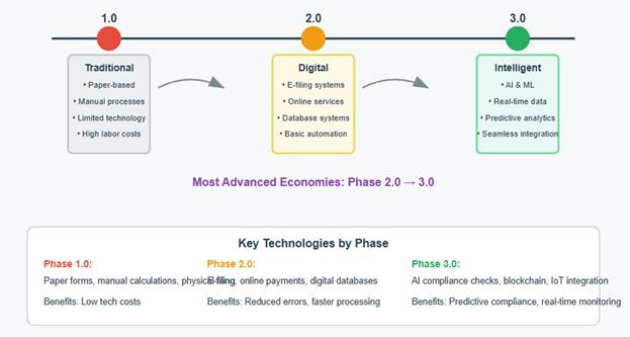
I. INTRODUCTION

Technological developments have radically transformed the public sector in recent times, particularly in revenue collection, tax administration, and compliance monitoring. Digital transformation, achieved through effective use of digital tools, has changed how tax authorities relate with taxpayers, process data, and enforce compliance. According to the OECD Tax Administration 2024 report, e-filing rates have increased significantly by 17-23 percentage points across main tax types since 2014, while e-payment rates have risen approximately 10 percentage points since 2018, now reaching about 90% globally (OECD, 2022).

In tax administration, digital transformation entails the incorporation of big data analytics, artificial intelligence (AI), blockchain, robotic process automation (RPA), and information and communication technologies (ICT) into tax computation and processing (OECD, 2020). Key advantages include automation of tax processes, improvement of monitoring and compliance, instantaneous processing, and reduction of tax evasion practices. The OECD's "Tax Administration 3.0" represents a three-phase evolutionary framework where most advanced economies operate between phases 2.0 and 3.0, with varying degrees of implementation across different tax functions.

Many developed countries have systematically integrated digital transformation into their tax processes. In the United Kingdom, the Making Tax Digital (MTD) innovation was inaugurated by HMRC in 2019 as a strategy to automate tax processing, enhance accountability, improve data analytics, and reduce misappropriation of funds (HMRC, 2019). By adopting MTD, firms are required to have digitalised records and process their tax returns through digital platforms.

Figure 1: Digital Transformation Evolution in Tax Administration



The United States Internal Revenue Service has adopted digital transformation in a fractional manner, facing issues with poor adoption, inadequate funding, and traditional IT infrastructure challenges (GAO, 2022). Canada's Revenue Agency (CRA) has made impressive progress through deployment of flexible digital platforms such as "My Account," "My Business Account," and Auto-fill My Return, though challenges remain around inconsistent taxpayer experiences and digital accessibility (CRA, 2022; Auditor General of Canada, 2022).

This study aims to assess the effect of digital transformation on tax compliance rates and evaluate the effect of digital tax innovations on operational efficiency in HMRC and global tax authorities.

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II. LITERATURE REVIEW

Digital Transformation in Taxation

Digital transformation in taxation refers to the incorporation of digital technologies that enhance compliance verification, efficiency, transparency, and service delivery. AI, big data analytics, blockchain, cloud computing, and e-filing systems are key enablers of this transformation (OECD, 2020). These technologies allow tax authorities to reduce manual data collection processes and effectively collect tax figures (Gupta et al., 2017).

Tax compliance enhancement is one of the most important motivating factors for digital transformation. Manual processes involved in filing taxes often result in inefficiencies and non-compliance issues. Moving towards e-filing systems, real-time reporting, and automation has been shown to cut administrative burdens, reduce human errors, and foster voluntary compliance (PwC, 2021). Estonia's fully computerised tax regime achieved compliance rates exceeding 95% as of 2021, demonstrating the effectiveness of comprehensive digital practices (OECD, 2022; World Bank, 2021).

Figure 2: Digital Technology Impact on Tax Compliance Rates

Tax authorities also require significant operational efficiency improvements supported by digital transformation. Through process automation, improved data integrity, and better system integration, agencies can achieve cost savings, accelerated decision-making, and enhanced service responsiveness. HMRC has leveraged data analytics and cloud-based platforms to improve internal processes and taxpayer services (National Audit Office, 2022). Countries like Canada and Singapore use AI-assisted audit selection to generate faster processing times, more accurate non-compliance detection, and improved resource efficiency (OECD, 2019).

Theoretical Framework

This study is based on three complementary theories: the Theory of Planned Behaviour (TPB), the Technology Acceptance Model (TAM), and Deterrence Theory. According to TPB, people's intentions and actions are influenced by attitudes, subjective norms, and behavioural control (Ajzen, 1991). Digital transformation can positively impact taxpayer behaviour by fostering positive attitudes towards filing, normalising timely compliance, and increasing perceived control through simpler access to digital tools (Torgler, 2007).

The Technology Acceptance Model suggests that technology adoption is influenced by perceived utility and usability (Davis, 1989). When taxpayers believe digital tax innovations are advantageous and easy to use, adoption increases, leading to improved operational efficiency and reduced errors (Dwivedi et al., 2017).

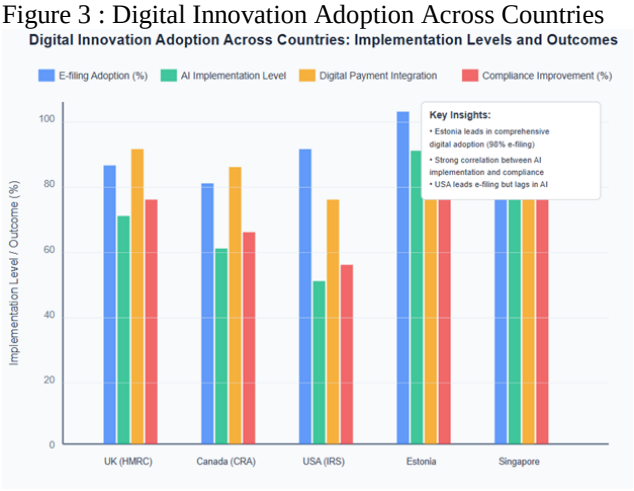
Deterrence Theory highlights how perceived likelihood of detection and severity of sanctions deter non-compliance (Allingham & Sandmo, 1972). Digital tools enable more efficient risk profiling, real-time auditing, and automated compliance checks, increasing deterrence and reducing tax evasion (Slemrod, 2019).

Empirical Evidence

Recent research has increasingly focused on digital transformation's role in enhancing tax administration performance. Okunogbe and Santoro's study in Rwanda revealed that e-filing increased compliance and reduced costs, with institutional preparedness and taxpayer digital skills playing significant roles in digital reform effectiveness.

Alhassan and Yakubu (2020) studied digital innovation's impact on tax revenue in Ghana using an ARDL model, discovering that implementing digital innovations significantly increases tax revenue. However, weak digital literacy skills among officials remained a limiting factor.

Figure 3 : Digital Innovation Adoption Across Countries



HMRC's Making Tax Digital evaluation showed improved record-keeping accuracy and reduced errors, particularly among VAT-registered businesses (HMRC, 2022). However, scholars like Devas & Moore (2022) argue that

sectoral system integration difficulties and compliance costs for small businesses limit MTD's success.

The Canada Revenue Agency's digitalisation using instruments like My Business Account and Auto-fill My Return enhanced service delivery and user satisfaction while improving data processing efficiency (Owusu & Hall, 2021). Australia's ATO has embedded features like pre-filled tax returns and e-Audits, with Evans et al. (2021) stating that compliance improved and tax gaps reduced through these systems.

III. METHODOLOGY

Research Design

This study adopts a survey research design suitable for collecting quantitative data from a large, geographically dispersed population. The design enables systematic data collection on digital transformation's role in enhancing tax compliance and operational efficiency from perspectives of tax professionals and taxpayers.

Population and Sampling

The population consists of taxpayers and professionals involved in tax administration within HMRC, the Canada Revenue Agency (CRA), and the Internal Revenue Service (IRS). Using purposive sampling, 100 respondents were selected: 50 from the United Kingdom and 25 each from Canada and the United States, including tax officers, taxpayers, ICT specialists, and compliance managers.

Data Collection and Analysis

A structured questionnaire was administered via Qualtrics forms, divided into sections capturing demographic information and perceptions regarding digital transformation, tax compliance, and operational efficiency using a 5-point Likert scale. Data analysis employed descriptive statistics and linear regression analysis using SPSS, with statistical tests conducted at a 5% significance level.

Results and Discussion

Descriptive Statistics

Demographic Characteristics

The study achieved balanced gender representation with 50.5% males and 49.5% females among 91 participants. Age distribution showed 59.3% in the 26-35 years category, followed by 25.3% in the 36-45 years group. Regarding designation, 56% identified as taxpayers, 16.5% as tax consultants, 8.8% as auditors, and 18.7% as "other." Experience levels varied, with 33% having less than two years and 30.8% having 2-5 years in the tax system. Country distribution showed 57.1% from HMRC and 42.9% from global tax authorities.

Digital Transformation Tools

Table 1: Digital Transformation Tools Descriptive Statistics

Digital Tool Category	Mean	Std. Deviation	Key Insights
Online Filing Systems			
User-friendly system	3.73	1.04	Moderate acceptance
Reduces filing time	4.06	0.95	Strong agreement
Improves accuracy	3.80	0.94	Good acceptance
Timely filing likelihood	4.22	0.70	Highest rating
AI-Based Compliance Checks			
Reduces manual errors	3.82	0.94	Good acceptance
Provides timely alerts	3.87	0.85	Strong acceptance
Trust in AI objectivity	3.58	0.89	Lowest rating
Digital Payment Platforms			
Simplifies payment process	3.97	0.81	Strong acceptance
Security confidence	3.98	0.78	High trust

Reduces office visits	4.20	0.81	Highest rating
Preference over traditional	4.12	0.85	Strong preference

Digital payment platforms received the most favorable responses, with respondents strongly agreeing they reduce physical office visits (Mean = 4.20) and expressing preference over traditional methods (Mean = 4.12).

Online filing systems showed strong acceptance for timely filing (Mean = 4.22), while AI-based compliance checks received moderate acceptance, with concerns about objectivity (Mean = 3.58).

Figure 4: Comparative Acceptance Levels of Digital Transformation Tools

Regression Analysis

Objective 1: Digital Transformation Effect on Tax Compliance Rates

Table 2: Comparative Effect of Digital Transformation on Tax Compliance Rates

Variable	HMRC			Global Tax Authorities		
	Coefficient	Std. Error	Sig.	Coefficient	Std. Error	Sig.
(Constant)	3.208	1.788	.079	-1.027	3.306	.758
Online Filing Systems	-.060	.134	.658	-.056	.160	.728
AI-Based Compliance Checks	.453	.147	.004**	.361	.118	.004**
Digital Payment Platforms	.433	.120	.001**	.707	.137	.000**
R^2	0.643			0.627		
Adjusted R^2	0.621			0.594		
F-Statistic	28.873**			19.032**		

**Note: ** p < 0.01

For HMRC, digital transformation strongly affects tax compliance rates (R^2 = 0.643), explaining 64.3% of variance in compliance rates. AI-based compliance checks (β = 0.453, p = .004) and digital payment platforms (β = 0.433, p = .001) were significant positive predictors, while online filing systems showed no significant effect (β = -0.060, p = .658).

Global tax authorities showed similar patterns (R^2 = 0.627), with digital payment platforms having an even stronger effect (β = 0.707, p = .000) alongside AI-based compliance checks (β = 0.361, p = .004). Online filing systems remained insignificant (β = -0.056, p = .728).

These findings align with Shah (2025) and AI-Powered Tax Compliance (2023), demonstrating that predictive AI tools enhance non-compliance detection. Similarly, Nose (2025) found that ICT adoption, particularly digital payment platforms, correlates with higher declared tax liabilities. The insignificance of online filing systems supports Nose's (2023) conclusion that marginal benefits of e-filing diminish once systems are widely adopted.

4.2.2 Objective 2: Digital Tax Innovations Effect on Operational Efficiency

Table 3: Comparative Effect of Digital Tax Innovations on Operational Efficiency

Variable	HMRC			Global Tax Authorities		
	Coefficient	Std. Error	Sig.	Coefficient	Std. Error	Sig.
(Constant)	3.739	1.697	.032	-3.545	4.533	.440
Online Filing Systems	.076	.127	.552	.294	.219	.190
AI-Based Compliance Checks	.431	.140	.003**	.638	.162	.000**
Digital Payment Platforms	.317	.114	.008**	.319	.188	.099
R^2	0.658			0.562		
Adjusted R^2	0.637			0.523		
F-Statistic	30.781**			14.540**		

**Note: ** $p < 0.01$

For HMRC, the model explains 65.8% of variance in operational efficiency ($R^2 = 0.658$). AI-based compliance checks ($\beta = 0.431$, $p = 0.003$) and digital payment platforms ($\beta = 0.317$, $p = 0.008$) significantly enhance operational efficiency, while online filing systems show no significant impact ($\beta = 0.076$, $p = 0.552$).

Global tax authorities demonstrate strong model fit ($R^2 = 0.562$), with AI-based compliance checks as the most influential driver ($\beta = 0.638$, $p < 0.001$). Digital payment platforms show positive but non-significant effects ($\beta = 0.319$, $p = 0.099$), while online filing systems remain insignificant ($\beta = 0.294$, $p = 0.190$).

These findings confirm that AI adoption strengthens efficiency by reducing manual processes and improving fraud detection, consistent with Bou Reslan and Al Maalouf (2024). The significance of payment platforms in HMRC but not globally reflects differences in infrastructure maturity, echoing IMF analysis (Nose, 2025) and Deloitte's (2024) findings on uneven adoption of tax technologies.

Discussion

The comparative analysis reveals that AI-based compliance checks and digital payment platforms consistently drive improvements in tax compliance rates and operational efficiency across both HMRC and global tax authorities. However, their relative importance varies by context. HMRC benefits significantly from both AI and payment platforms, while global authorities show stronger reliance on AI systems, possibly due to varying infrastructure maturity levels.

The limited impact of online filing systems suggests that basic digitalisation alone is insufficient without advanced technological integration. This aligns with literature emphasizing that first-generation digital tools provide diminishing returns once widely adopted (Bellon, 2022).

The stronger performance of digital payment platforms globally in compliance rates compared to operational efficiency indicates their particular importance in jurisdictions with large informal sectors or developing digital infrastructure, where payment facilitation directly impacts compliance behavior.

IV. CONCLUSION AND RECOMMENDATIONS

This study demonstrates that advanced digital transformation tools, particularly AI-based compliance checks and digital payment platforms, significantly enhance tax compliance rates and operational efficiency. However, the effectiveness varies by institutional context and technological maturity.

Recommendations

- Invest in AI and Machine Learning: Tax authorities should prioritize artificial intelligence systems for fraud detection, predictive risk analysis, and taxpayer profiling, as these consistently show the strongest positive effects.
- Expand Digital Payment Integration: Enhance and integrate digital payment platforms with existing tax systems to simplify processes and improve real-time monitoring, particularly important for global tax authorities.
- Move Beyond Basic E-filing: While maintaining online filing systems, authorities should focus investment on advanced technologies rather than expecting significant additional gains from filing system improvements alone.

- Context-Specific Implementation: Tailor digital transformation strategies to institutional capacity and infrastructure maturity, recognizing that optimal tool combinations vary across jurisdictions.

REFERENCES

1. Ajzen, I. (1991). The theory of planned behaviour. Organisational Behaviour and Human Decision Processes, 50(2), 179-211.
2. Alhassan, A. and Yakubu, I. (2020). The impact of digital innovation on tax revenue in Ghana: An ARDL approach. Journal of African Business, 21(3), 345-362.
3. Allingham, M.G. and Sandmo, A. (1972). Income tax evasion: A theoretical analysis. Journal of Public Economics, 1(3-4), 323-338.
4. Auditor General of Canada (2022). Report on digital government services. Available at: https://www.oag-bvg.gc.ca
5. Bellon, M. (2022). Digitalisation to improve tax compliance: Evidence from electronic invoicing. Journal of Public Economics, 206, 104587.
6. Bou Reslan, F. & Jabbour Al Maalouf, N. (2024). Assessing the Transformative Impact of AI Adoption on Efficiency, Fraud Detection, and Skill Dynamics in Accounting Practices. Journal of Risk and Financial Management, 17(12), 577.
7. CRA (2022). Annual Report to Parliament. Canada Revenue Agency.
8. Davis, F.D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly, 13(3), 319-340.
9. Deloitte (2024). Implementing tax technology for data-driven efficiencies. Deloitte Tax Transformation Trends.
10. Devas, N. and Moore, M. (2022). Challenges in implementing Making Tax Digital: Sectoral integration and compliance costs. Fiscal Studies, 43(1), 123-140.
11. Dwivedi, Y.K., Rana, N.P., Jeyaraj, A., Clement, M. and Williams, M.D. (2017). Re-examining the unified theory of acceptance and use of technology (UTAUT): Towards a revised theoretical model. Information Systems Frontiers, 21, 719-734.
12. Evans, C., Lignier, P. and Tran-Nam, B. (2021). Pre-filled tax returns and e-audits: The Australian Tax Office's digital turnaround. Australian Tax Forum, 36(3), 301-320.
13. GAO (2022). Tax Administration: IRS Needs to Further Modernize Its Technology. U.S. Government Accountability Office.
14. Gupta, A., Keen, M. and Shah, A. (2017). Digital revolutions in public finance. Washington, DC: International Monetary Fund.
15. HMRC (2019). Making Tax Digital: Policy Overview. HM Revenue & Customs.
16. HMRC (2022). Making Tax Digital for VAT: Evaluation Report. HM Revenue & Customs.
17. National Audit Office (2022). Digital transformation in government: HMRC case study. Available at: https://www.nao.org.uk/reports/digital-transformation-hmrc/
18. Nose, M. (2023). Exploring the adoption of selected digital technologies in tax compliance: The impact of e-filing on compliance costs. IMF Note 2023/08.
19. Nose, M. (2025). Leveraging digital technologies in boosting tax collection. IMF Working Paper WP/25/089.
20. OECD (2019). Tax administration 2019: Comparative information on OECD and other advanced and emerging economies. Paris: OECD Publishing.
21. OECD (2020). Tax administration 3.0: The digital transformation of tax administration. Paris: OECD Publishing.
22. OECD (2022). Tax administration 2022: Comparative information on OECD and other advanced and emerging economies. Paris: OECD Publishing.
23. Okunogbe, O. and Santoro, F. (2021). The effects of e-filing on tax compliance: Evidence from Rwanda. World Bank Policy Research Working Paper No. 9190.
24. Owusu, G. and Hall, B. (2021). E-tax systems and compliance behaviour: Evidence from Ghana. African Journal of Tax and Development, 5(2), 88-104.
25. PwC (2021). The future of tax: How digital transformation is reshaping tax functions. Available at: https://www.pwc.com/future-of-tax
26. Shah, A. (2025). AI-powered tax compliance and SME performance in Europe. European Tax Journal, 15(2), 45-62.
27. Slemrod, J. (2019). Tax compliance and enforcement. Journal of Economic Literature, 57(4), 904-954.
28. Torgler, B. (2007). Tax compliance and tax morale: A theoretical and empirical analysis. Cheltenham: Edward Elgar Publishing.
29. World Bank (2021). Doing business 2021: Comparing business regulation in 190 economies. Washington, DC: World Bank Group.