Enhancing IT-Based Tax Payment Systems in Local Authorities in Colombo District in Sri Lanka

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Abstract

Local Authorities (LAs) in Sri Lanka have a significant responsibility to provide quality public services and are authorized to collect rates and taxes as primary income sources. The efficiency and effectiveness of service delivery determine the level of public satisfaction. However, inefficiencies in manual tax collection and the limited adoption of IT-based systems have posed challenges, highlighting the need to assess the effectiveness of existing digital tax payment systems in LAs. This study addresses the question: How effective and efficient are the existing IT-based tax payment systems in Colombo District LAs, and what strategies can improve their performance? Accordingly, the research analyzes the Strengths, Weaknesses, Opportunities, and Threats (SWOT) of existing IT-based tax and fee payment systems and identifies strategies to enhance their effectiveness and efficiency. The study focuses on twelve (12) LAs in the Colombo District that currently use IT-based tax payment systems. Data were collected through semi-structured interviews and secondary sources such as legal provisions, policies, and project reports. A qualitative analysis was conducted using the Innovation Diffusion Theory (IDT) as the theoretical framework, as it provides a comprehensive basis for understanding how innovations are adopted within organizations. The SWOT analysis was structured around the five (05) attributes of IDT relative advantage, compatibility, complexity, trialability, and observability, and their parameters. Overall, the findings reveal that the strengths of these systems are substantial, demonstrating that IT-based tax payment systems positively influence the functionality and performance of LAs. Finally, strategies to enhance effectiveness and efficiency were proposed under three key areas: structural development, educational development, and attitudinal development.

Keywords: Innovation Diffusion Theory, IT-Based Tax Payment Systems, Local Authorities, SWOT

1. Introduction

Sri Lanka has three types of Local Authorities (LAs): Municipal Councils (MCs), Urban Councils (UCs), and Pradeshiya Sabhas (PSs). MCs govern city areas and townships, UCs manage suburban areas, and PSs serve rural and remote regions. There are 341 LAs, comprising 24 MCs, 41 UCs, and 276 PSs. MCs are established under Sections 2, 3, 5, 7, 8, and 9 of the MCs Ordinance (1947), UCs under Sections 2, 3, 5, 8, and 9 of the UCs Ordinance (1939), and PSs under Sections 2, 4, and 8 of the PSs Act No. 15 of 1987.

LAs are responsible for regulating, controlling, and administering all matters related to community well-being, public utility services, and local development. They are authorized to collect taxes and fees to generate revenue for providing these services. Currently, most LAs rely on manual systems for tax collection, requiring citizens to visit offices, which is inefficient and inconvenient for both staff and the public. Some LAs have introduced IT-based and online systems, but many of them face operational challenges, limited functionality, and incomplete staff satisfaction.

At present, members of the public must visit their respective LAs to pay these taxes and fees, as most LAs still use manual systems for collection. This process is inefficient and inconvenient for both LA staff and the public. Although some LAs have introduced computer-based and online systems for tax and fee collection as part of a modernized approach to service delivery, most of these systems are not functioning effectively, face numerous operational challenges, and have not gained full staff satisfaction. Even the recently implemented IT-based systems have failed to deliver effective and efficient services due to several practical issues and limitations.

Given these issues, it is crucial to assess the effectiveness and efficiency of IT-based tax payment systems and identify opportunities for improvement. The existing literature largely focuses on technical aspects or private-sector adoption, leaving a gap regarding organizational perspectives in LAs, particularly in Sri Lanka, where digital systems are still in development. This study addresses this gap by assessing IT-based tax payment systems in Colombo District LAs using the Innovation Diffusion Theory (IDT) to analyze their Strengths, Weaknesses, Opportunities, and Threats (SWOT) and propose strategies for enhancing system effectiveness and efficiency.

In the context outlined above, the research objectives of this study are to:

01. Analyze the Strengths, Weaknesses, Opportunities, and Threats (SWOT) of existing IT-based tax payment systems used by LAs in Sri Lanka.
02. Identify the strategies that can be adapted to enhance the effectiveness and efficiency of existing IT-based tax payment systems in LAs.

2. Literature Review

The integration of Information Technology (IT) in public sector services has been widely studied, highlighting its potential to improve service delivery, transparency, and citizen engagement, alongside implementation challenges. Despite global advances, many developing countries still face difficulties optimizing IT-based tax systems at the local authority level. This review synthesizes prior research relevant to evaluating IT-based tax payment systems in Sri Lankan LAs through SWOT analysis within the IDT framework. The literature is organized into four sections: IT-based systems in the public sector, IT-based systems in taxation, technology acceptance models/theories, and Innovation Diffusion Theory (IDT).

2.1. IT-based Systems in the Public Sector

E-governance and the digital transformation of the public sector are central themes in contemporary public administration, aiming to provide efficient, accountable, and transparent service delivery to the public. However, the effectiveness of these systems and their adoption vary across the world based on different factors.

In the Sri Lankan context, Deshapriya (2022) evaluates the impact of e-government initiatives on public administration since 2005, emphasizing new policies, rules, and regulations. Key structural changes include the establishment of the Information and Communication Technology Agency (ICTA), the Re-engineering Government (Re-Gov) Programme, and the ICT Service under the Ministry of Public Administration, which expanded IT units in public organizations. The study also highlights gaps in e-government, such as poor communication between top management and IT units, limited citizen adoption, insufficient research, and restricted open data sharing.

Accessibility is a key concern in IT-based systems. Kiambati et al. (2024) examined digital library access for visually impaired users in Kenyan public universities, finding that type of impairment, prior assistive technology training, and usage frequency significantly affect success. The study emphasized that system availability alone does not ensure equitable access; adaptability, navigability, and compatibility with assistive tools are crucial for proper adoption. Insights from Ghana during the COVID-19 pandemic further highlight the benefits of digital systems in the public sector.

Owusu et al. (2023) studied digital surveillance platforms in Ghana, showing how they enhanced paper-based disease monitoring through real-time updates, hotspot identification, and public sentiment analysis. The study noted that effectiveness depends on reliable internet, sufficient resources, and equitable access, challenges common in developing countries, including Sri Lanka. It emphasized that digitalization must also prioritize human resources, local expertise, and community engagement, highlighting that successful public sector digitalization requires technology, planning, capacity building, and inclusive access.

Mekonen et al. (2025) examined Ethiopia's health commodities logistics management system, revealing that poor internet, unreliable electricity, limited computers, and staff shortages hindered performance. The study emphasized that effective digital systems require not only hardware and software but also reliable power, consistent supervision, feedback mechanisms, and trained staff in IT and supply chain management.

Musa et al. (2022) studied Indonesia's SimBaznas digital system, finding that user-friendliness, infrastructure, and availability alone do not ensure effective implementation. The main issue was inadequate IT human resources, especially for data entry and reporting, and the study highlighted that trust, awareness, and usability matter more than system functionality for user engagement.

Overall, these studies show that IT-based systems can enhance public sector service delivery, but their success depends on human resources, infrastructure, accessibility, and institutional support, but mere adoption is insufficient.

2.2. IT-based Systems in Taxation

Digital transformation in taxation is a key aspect of e-government, aiming for efficient public finance management, but its success depends on technological capacity, organizational context, and user engagement.

In Sri Lanka, Indika and Ariyawansa (2024) found that both staff and technology positively influence assessment tax administration in the Colombo Municipal Council (CMC), with staff being the most influential factor.

On the other hand, Withanage et al. (2022) studied the e-Vehicle Revenue License and e-Police Clearance Certificate systems in CMC, finding that usefulness, ease of use, and trust in the internet and government positively influence adoption. Challenges included security, data privacy, and system quality, highlighting that technical adaptation alone is insufficient. The study emphasized simplicity, reliability, accessibility, awareness, and a centralized e-government portal.

Senadeera and Charith (2024) proposed a blockchain-based framework to enhance transparency and trust in tax collection, using digital identities, unique transaction IDs, and expenditure tagging. Although the system is not yet implemented, it reflects growing interest in IT-based tax systems.

Not only in Sri Lanka but also in other countries, tax systems are considered one of the central areas under e-government agendas. Islam et al. (2024) examined digital transformation in Bangladeshi municipalities, identifying key barriers such as limited resources, inadequate infrastructure, server failures, insufficient staff training, low awareness, data privacy issues, weak policies, and financial constraints. Success depends on government support, legal frameworks, and adequate infrastructure.

Hans and Rutenge (2024) assessed e-government adoption in Tanzania's Kinondoni MC, and found that it improved service delivery, accountability, transparency, decision-making, economic development, information flow, and data security. Key barriers included limited IT infrastructure, unskilled personnel, financial constraints, and resistance to adoption. Success requires investment, training, funding, and effective change management.

Belahouaoui and Attak (2024a) reviewed literature from 2016–2023 on digital taxation, AI, and tax administration, finding that artificial intelligence (AI) and blockchain enhance compliance and efficiency, especially for Small and Medium-sized Enterprises (SMEs). Challenges include bureaucratic inefficiencies, resource shortages, low digital trust, and limited regulatory frameworks. Further, the authors (2024b) revealed that digital tax compliance depends on the quality of the relationship and trust between taxpayers and authorities, shaped by clear communication and simplified procedures. Even advanced systems may fail if trust is low or communication is unclear.

Herbart et al. (2025) found a strong link between financial performance and the use of the Integrated Financial Management, Programme-based Budgeting, and Integrated Personnel and Payroll systems in Kabale District Local Government, recommending their promotion for effective financial management.

IT positively influences property tax administration in Zimbabwe, improving timely revenue collection, record-keeping, management integrity, and local government income (Wadesango et al., 2024). Similarly, IT positively impacts tax administration in Nigeria, improving processes, reducing errors, enhancing efficiency and compliance, and curbing corruption, recommending user-friendly, mobile-compatible, and secure e-taxation systems (Ihenyen et al., 2022).

As per Olaoye et al. (2025) IT enhances tax administration in Nigeria by automating processes, reducing delays, improving transparency, monitoring, and compliance,

while challenges include regulatory gaps and informal sector exclusion, recommending IT investment, informal sector inclusion, and staff capacity building.

IT enhances tax administration by improving tax base identification, compliance monitoring, and reducing transaction costs, but its effectiveness is limited in developing countries due to poor infrastructure, adoption resistance, unsophisticated systems, trust deficits, and security concerns (Okunogbe and Santoro, 2023).

Overall, the literature shows that IT-based systems can enhance tax administration by improving efficiency, compliance, transparency, and accountability, but adoption challenges persist, making it essential to assess existing systems for continuous improvement.

2.3. Technology Acceptance Models/Theories

Given the complex human-technology interaction influenced by sociological and psychological factors, researchers have developed various theories and models to explain technology adoption and use, summarized in Table 01.

Table 01: Summary of key factors of technological acceptance models and theories

Theory/Model	Scholar/s and Year	Key Factors/ Perspective
Theory of Reasoned Action (TRA)	M. Fishbein and I. Ajzen (1975)	Attitudes, social norms and intentions
Social Cognitive Theory (SCT)	Albert Bandura (1986)	Social context with a dynamic and reciprocal interaction of the personal factors, environmental factors, and behaviours
Technology Acceptance Model (TAM)	Fred Davis (1989)	Perceived usefulness, perceived ease of use, and attitude toward use
Theory of Planned Behavior (TPB)	I. Ajzen (1991)	Attitude, subjective norms, perceived behavioural control, and intentions on the actual behaviour.
Model of PC Utilization (MPCU)	R. Thompson, C. Higgins and J. Howell (1991)	Job fit, complexity, long-term consequences, affect toward use, the social factor and the facilitating conditions
Motivation Model (MM)	F. Davis, R. Bagozzi and P. Warshaw (1992)	Individual's behaviour based on intrinsic motivation (a person's inner drive to perform the task and relates to perceptions of pleasure and satisfaction) and extrinsic motivation (outside the person or outside the task).

Combined TAM – TPB	S. Taylor and P. A. Todd (1995)	Linking the predictors of TPB with the constructs of perceived usefulness and ease of use from TAM. Attitude - usefulness (relative advantage), perceived ease of use (complexity) and compatibility, Normative belief structure - peer influence and superior influence and control belief structure - self-efficacy and facilitating conditions.
Innovation Diffusion Theory (IDT)	E. Rogers (1995)	Innovation is an idea, process, object, or practice that can be considered to be new, and diffusion is the process by which it gets into the social system. Five determinants are relative advantage, compatibility, complexity, trialability, and observability.
Extension of TAM (TAM2)	V. Venkatesh and F. D. Davis (2000)	Adding two more determinants to the original TAM: social influences (subjective norms and images) and cognitive instrumental Processes (job relevance, output quality, result demonstrability and perceived ease of use).
Unified Theory of Acceptance and Use of Technology (UTAUT)	V. Venkatesh, M. G. Morris, G. B. Davis and F.D. Davis (2003)	Performance expectancy, effort expectancy, social influence and facilitating conditions.
Technology Acceptance Model (TAM3)	V. Venkatesh and H. Bala (2008)	Perceived ease of use – computer self-efficacy, computer playfulness, computer anxiety, perception of external control, perceived enjoyment and objective usability. Perceived usefulness – subjective norms, job relevance, result demonstrability and image.
Extending Unified Theory of Acceptance and Use of Technology (UTAUT2)	V. Venkatesh, J. Thong and X. Xu (2012)	This model included the independent variables of UTAUT but added three more which are hedonic motivation, price value and habit.

Source: Alomary and Woollard (2015)

2.4. Innovation Diffusion Theory

Holland (1997) examined diffusion of innovation theories, highlighting the role of librarians in guiding users and summarizing related concepts and models. The study emphasizes internal staff engagement as key to successful technology diffusion, a point relevant to Sri Lankan LAs, where administrative staff mediate between digital systems and the public, underscoring organizational readiness and staff capability in managing IT-based tax systems.

Okour et al. (2020) examined how technological backgrounds influence decision-makers' use of knowledge management systems in Jordanian banks using IDT. Findings showed that comparative advantage, system structure, and information clarity affected usage, while system suitability did not. Although in banking, these insights apply to Sri Lankan LAs, where managerial perceptions and system design are crucial for successful tax system implementation.

Shaikh et al. (2019) examined household acceptance of "takaful" schemes in Pakistan using IDT. Findings showed that acceptance depends on perceived advantage, compatibility, awareness, and trust, while complexity was not a predictor. Although focused on individuals, the study highlights that cultural and cognitive factors also affect institutions. For Sri Lankan LAs, public awareness and trust in government IT platforms can shape perceived legitimacy and system usability, emphasizing the need for strategic communication and user engagement.

Jamshidi and Kazemi (2019) studied clients' intention to use Islamic credit cards using IDT, finding that relative advantage, compatibility, awareness, satisfaction, and attitudes shaped usage intentions. Though focused on consumers, the findings apply to institutions. For LAs, ensuring process compatibility, improving system performance, and fostering stakeholder satisfaction are key to enhancing the effectiveness and sustainability of IT-based tax payment systems.

Overall, while many studies have evaluated effectiveness and user acceptance mainly in the private sector using various models and quantitative methods research on IT-based systems in the public sector remains limited. Studies on IT-based tax payment systems are rare globally, and virtually nonexistent in Sri Lanka. This research is significant as it focuses on local government tax systems in Sri Lanka, employs qualitative methods, and applies an IDT-based framework from an organizational perspective.

3. Research Methodology

3.1. Study Area

The Colombo District was selected as the study area for this research, and it consists of thirteen (13) LAs. Among these thirteen (13) LAs, there are five (05) MCs, five (05) UCs, and three (03) PSs.

- Colombo Municipal Council (CMC)
- Dehiwala-Mount Lavinia MC
- Sri Jayewardenepura Kotte MC
- Kaduwela MC
- Moratuwa MC
- Maharagama UC
- Boralesamuwa UC
- Kesbewa UC
- Kolonnawa UC
- Seethawakapura UC
- Seethawaka PS
- Homagama PS
- Kotikawatta Mulleriyawa PS

The Colombo District was selected as the study area for several reasons. As the most populated district, with the CMC being the largest LA, it faces significant service delivery challenges, making IT-based systems and e-Governance essential. Additionally, most LAs (92%) in Colombo, except Seethawaka PS, have adopted IT-based tax payment systems. The district also offers high feasibility for future system improvements due to its available resources, technological infrastructure, and status as Sri Lanka's main commercial hub.

3.2. Data Collection

Data were collected from both primary and secondary sources. Secondary sources, including legal provisions, policies, and project reports, were used to examine LA tax and fee collection processes, while semi-structured interviews served as primary sources to identify the SWOT of existing IT-based tax payment systems and strategies to enhance their effectiveness and efficiency.

Semi-structured interviews were conducted with staff from the twelve (12) LAs using IT-based tax payment systems, based on the five (05) IDT attributes—relative advantage, compatibility, complexity, trialability, and observability. These attributes

guided the investigation of parameters related to system satisfaction and adoption to identify the SWOT of existing IT-based tax and fee payment systems (Table 02).

Table 02: Attributes and parameters of IDT used for this study

Attribute	Parameter
Relative advantage	Efficiency
	Low cost
	Reduced corruption/ transparency
	Traceability/ measurement
	Time saving
	Convenience service
Compatibility	Meeting expectations
	Change perception
	Satisfaction of quality
Complexity	Easy to understand
	User-friendly interface
	Functionality
Trialability	Pre-testing and testing
	Access to online public services
Observability	Knowledge and awareness campaigns
	Adequacy of resources

Source: Rogers (1995)

The sample for the semi-structured interviews was purposively selected, targeting key staff directly operating the existing IT-based systems in each LA. This approach allowed participants to openly express their experiences and perspectives on the systems they regularly used.

The semi-structured interview guide was based on the five IDT attributes, and twelve (12) face-to-face interviews were conducted with officers directly using the systems in the relevant LAs. Details of the interviewees are presented in Table 03.

Table 03: Details of interviewees

Local Authority	Service of the Public Sector which belongs to the Interviewee in the LA	Duration of the Interview
CMC	Management Service Officer's Service	1 hr
Dehiwala-Mount Lavinia MC	Management Service Officer's Service	2 hr
Sri Jayewardenepura Kotte MC	Management Service Officer's Service	40 min
Kaduwela MC	Management Service Officer's Service	45 min
Moratuwa MC	Management Service Officer's Service	40 min

Maharagama UC	Management Service Officer's Service	1 hr
Boralesamuwa UC	Management Service Officer's Service	40 min
Kesbewa UC	Management Service Officer's Service	40 min
Kolonnawa UC	Management Service Officer's Service	40 min
Seethawakapura UC	Management Service Officer's Service	1 hr
Homagama PS	Public Officer	1 hr 15 min
Kotikawatta Mulleriyawa PS	Management Service Officer's Service	1 hr 35 min

Source: Survey Data

3.3. Data Analysis

Data from the semi-structured interviews were transcribed verbatim and cross-checked with interview notes for accuracy. Key themes were identified, labelled, and aligned with IDT attributes using thematic analysis, supported by direct quotations to ensure credibility. This process informed the SWOT analysis of IT-based tax payment systems and strategies to enhance their effectiveness and efficiency. The qualitative approach provided an in-depth understanding of LA challenges often overlooked in quantitative studies.

4. Analysis and Discussions

This section explains the SWOT of IT-based tax payment systems in LAs in the Colombo District and discusses strategies to enhance their effectiveness.

4.1. SWOT of IT-based Tax Payment Systems in Local Authorities in Colombo District

Of the thirteen (13) LAs in Colombo District, twelve use IT-based tax payment systems, while Seethawaka PS still relies on a manual system. These twelve LAs employ four systems: Emetsoft (3 LAs), eLG (2 LAs), Nekfa (6 LAs), and the CMC system (used exclusively by CMC), as shown in Table 4. The first IT-based system was introduced by CMC in 2013, and Maharagama UC launched its system on 5 July 2023. Only three LAs allow online payment of all taxes and fees, while the others limit their systems to rate payments.

In this study, the SWOT analysis of IT-based tax payment systems in Colombo District LAs was conducted using the IDT framework. IDT was selected for its comprehensive approach, examining innovation adoption and diffusion at the organizational level. Unlike TAM or UTAUT, which focus on individual behavior, IDT supports an in-depth qualitative assessment through its key attributes, as discussed below.

Table 04: IT-based tax payment systems used in LAs in Colombo District

Name of the Tax Payment System	Software Development Company	Local Authority	Focused Income Source in the System	Commenced Year of the System	Availability of Online Payment Facility	Commenced Year of Online Payments
CMC Payment System	Information and Communication Technology Agency (ICTA)	Colombo MC	All taxes and fees	2013	Rates, Trade Tax, Tax on businesses, Market Rental, House Rental, Shops and Boutiques Rental, Hawkers Rental	2013
Emetsoft	Emetsoft (Pvt) Ltd.	Dehiwala-Mount Lavinia MC	All taxes and fees	2018	Rates, Shop rents, trade tax, Trade licenses	2020
Emetsoft	Emetsoft (Pvt) Ltd.	Moratuwa MC	All taxes and fees	2018	Rates, Shop rents, trade tax, Trade licenses	2020
Emetsoft	Emetsoft (Pvt) Ltd.	Maharagama UC	Only for rates	2023	Only for rates	2023
eLG	Cicra Solutions	Sri Jayewardenepura Kotte MC	Only for rates	2014	Only for rates	2018
eLG	Cicra Solutions	Homagama PS	Only for rates	2014	Only for rates	2018
Nekfa	Nekfa Australia (Pvt) Ltd.	Kaduwela MC	Only for rates	2018	Only for rates	2021
Nekfa	Nekfa Australia (Pvt) Ltd.	Kesbewa UC	Only for rates	2018	Only for rates	2021
Nekfa	Nekfa Australia (Pvt) Ltd.	Kolonnawa UC	Only for rates	2017	Only for rates	2023
Nekfa	Nekfa Australia (Pvt) Ltd.	Boralesgamuwa UC	Only for rates	2020	Only for rates	2021
Nekfa	Nekfa Australia (Pvt) Ltd.	Seethawakapura UC	Only for rates	2021	Only for rates	2021

Nekfa	Nekfa Australia (Pvt) Ltd.	Kotikawatta Mulleriyawa PS	All taxes and fees	2018	Only for rates	2018
No IT-based tax payment system		Seethawaka PS				

Source: Interviews Carried Out by the Author

4.1.1. Relative Advantage of the System

Applying the IDT, relative advantage is one of the main attributes and is explained through the parameters of efficiency, cost-related benefits, transparency, traceability, time-saving, and convenience of the system's services.

4.1.1.1. Efficiency

The efficiency of a system can be defined as the capacity of a system to perform its designated function in a way that optimizes the use of inputs (Wrike Team, 2023). The IT-based tax payment system in CMC, in operation since 2013, has run efficiently for over ten years. A Management Services Officer noted that it handles not only rate payments but also trade tax, business tax, market and house rentals, and hawker fees online. Given CMC's 2023 population of 591,085 (Ministry of Public Administration, Home Affairs, Provincial Councils and Local Government, 2023), manual processing would be impractical, but the system efficiently manages payments and reports within seconds.

Next, Emetsoft, developed by Emetsoft (Pvt) Ltd., is used by Dehiwala-Mount Lavinia MC, Moratuwa MC, and Maharagama UC. An officer from Dehiwala-Mount Lavinia MC noted that it supports multiple online payments, provides payment history, quickly calculates early payment discounts (e.g., 10% before 31st January), and allows customizable report generation. Maharagama UC reported similar efficiency, enhanced by good internet coverage, high-speed fiber, and a tech-savvy, high-income population.

The IT-based system "eLG," developed by Cicra Solutions, is used by Sri Jayewardenepura Kotte MC and Homagama PS. Officers highlighted its efficiency in handling payments and generating reports. An officer at Homagama PS noted that manually managing over 150,000 rate units would need a large staff, but the system allows just six staff to manage payments and generate final account reports anytime.

Other LAs using the Nekfa system, developed by Nekfa Australia (Pvt) Ltd., reported similar efficiency in quick report generation and payment handling with minimal staff. However, an officer from Kesbewa UC noted login issues and incorrect report details:

> *"There are several issues in this system. We cannot log in sometimes, and the Aries reports are often incorrect. Shop rental amounts cannot be seen separately, and calculations are wrong. This system is a mess! How can we work properly with error reports?"* (An officer in Kesbewa UC).

Overall, all systems except Kesbewa UC showed high efficiency, supporting optimal staff use, multiple concurrent payments, fast report generation, and quick access to details, aided by good internet and user IT skills. Kesbewa UC was the only LA reporting inefficiencies.

4.1.1.2. Low Cost

All LAs with IT-based tax systems initially signed five-year agreements, followed by annual maintenance fees. CMC reported the highest satisfaction with both the system and the fee, while Maharagama UC also valued the investment relative to service quality and public benefit.

> *"We did not invest much money in developing this system. We only spent Rs. 850,000/- as a total investment, including software and infrastructure development. For infrastructure, we utilized only Rs. 300,000/-. It is worth it, and we are very satisfied with this investment"* (An officer in Maharagama UC).

The other Emetsoft users were satisfied with their investment. eLG users noted high costs prevented system expansion to mixed-income sources, though minimal-staff payment handling remained a key benefit. Similarly, Kolonnawa UC, Boralesgamuwa UC, and Seethawakapura UC reported high costs for expanding the Nekfa system.

On the other hand, the officer in Kotikawatta-Mulleriyawa PS noted a loss in 2022 when comparing the bank gateway fees for online payments with the revenue received:

> *"We pay Rs. 25,000/- annually to the bank for gateway access related to the online payment system, but last year we only received Rs. 17,000/- through online payments"* (An officer in Kotikawatta-Mulleriyawa PS).

In summary, CMC and Emetsoft users are highly satisfied, while eLG and Nekfa users face high expansion costs; losses stem mainly from low customer awareness and limited online payments, not system failure.

4.1.1.3. Reduced Corruption/ Transparency

All LAs stated that IT-based tax payment systems ensure transparency and prevent corruption, as payments are updated in real time, histories are recorded, and details

can be cross-checked with bank statements. Authorized officers have specific user accounts, data modifications require permission, and all changes are logged for review.

An officer in Maharagama UC explained that previously, some individuals obtained rate numbers for incomplete buildings to reduce rates, but now only authorized officers can modify data, with all changes tracked. Similarly, an officer in Homagama PS noted that manual collections allowed fund misuse, whereas the system now ensures accountability through regular deposits and recorded transactions.

4.1.1.4. Traceability/ Measurement

All four (04) systems have traceability facilities and adopt a similar approach for this purpose. All officers in LAs using these systems are provided with personal user accounts as authorized accounts, specifying accessibility based on their assigned duties, while unnecessary access is restricted. The logging history of each user can be checked, showing what actions were performed, by whom, and at what time. Additionally, the system can trace customers' payment histories and filter details as needed. This procedure ensures the traceability of the system.

4.1.1.5. Time Saving

All LAs reported that IT-based systems save time compared to manual methods in managing customers, calculating remaining payments, checking histories, and generating reports. An officer in Maharagama UC highlighted the ability to convert PDF reports to Excel, avoiding manual entry, while Sri Jayewardenepura Kotte MC noted calculations are completed within seconds. CMC also confirmed efficient report generation.

However, officers in Kesbewa UC, Kolonnawa UC, and Kotikawatta-Mulleriyawa PS were dissatisfied with the Nekfa system, as modifications require company intervention, causing delays. In contrast, Boralesgamuwa UC reported timely updates within 2–3 days. Overall, CMC and LAs using Emetsoft and eLG were satisfied with time-saving benefits, while experiences with Nekfa varied.

4.1.1.6. Convenience Service

All LAs that use IT-based tax payment systems and online payment systems are satisfied with the convenience provided by the systems compared to the manual process, although there are some software issues, as mentioned in the previous sections. The Officer in Kolonnawa UC expressed his views on the convenience of the system as follows:

"We cannot generate timely analytical reports. Except for that, there are no issues in this system. However, it is much more convenient than making reports manually, checking all the ledger books, and issuing handwritten bills to customers one by one" (An officer in Kolonnawa UC).

4.1.2. Compatibility

According to IDT, the compatibility of a system is evaluated using the parameters of meeting expectations, perception of change, and satisfaction with quality. This section explains the compatibility of all four IT-based tax payment systems, focusing on these parameters.

4.1.2.1. Meeting Expectations

CMC, committed to providing efficient, accountable, and technologically friendly public service, implemented its IT-based tax payment system in 2013. An officer noted the system meets expectations by enabling error-free management of all tax and fee payments despite the large population.

Other LAs also adopted IT-based systems to enhance revenue collection and service efficiency. Maharagama UC reported quick fulfillment of expectations due to close attention to client needs during system development. Sri Jayewardenepura Kotte MC and Homagama UC are generally satisfied with eLG, though some reports and local adjustments require manual handling.

For the Nekfa system, most LAs, including Kaduwela MC, Kolonnawa UC, Boralesgamuwa UC, and Seethawakapura UC, reported the system meets expectations. However, Kesbewa UC and Kotikawatta-Mulleriyawa PS faced frequent errors, delayed support, report issues, and limited payment functionalities. Overall, CMC is highly satisfied, while other LAs are generally satisfied with minor concerns.

4.1.2.2. Change Perception

Perceptions of IT-based tax payment systems vary across LAs. The officer in Maharagama UC noted that the online system, launched on 5th July 2023, improved service delivery and influenced customer behavior, collecting over Rs. 1,200,000 within five months. Long queues of 3–4 hours no longer occur, and daily online payments are monitored. Actively collecting customer feedback helps change mindsets, enhance system understanding, and better grasp expectations. Officers also interact randomly with customers in the UC and the field to discuss issues.

In contrast, Kotikawatta-Mulleriyawa PS faces low trust despite introducing the online system five years ago. To address this, an awareness program was initiated.

Field inquiries revealed some residents, especially in estate areas, prefer door-to-door collection.

> *"People are not much aware of the online payment system, though we started it in 2018. Less than 1% of people use this online payment mechanism to pay their rate payments"* (An officer in Kotikawatta-Mulleriyawa PS).

Perceptions depend on population characteristics, particularly education and attitudes.

4.1.2.3. Satisfaction of Quality

Based on the above, CMC is highly satisfied with their system, having used it effectively for over ten years. Maharagama UC is also very satisfied, despite focusing only on rate payments, due to their active involvement in the system's design, considering legal requirements, feasibility, and client needs. Other LAs are generally satisfied with their systems, as reflected by the Officer in Kolonnawa UC:

> *"I feel that this system is good around 90%"* (An officer in Kolonnawa UC).

Kesbewa UC, while somewhat satisfied with the system's quality, expressed minor dissatisfaction with its functionality and the responsiveness of Nekfa Australia (Pvt) Ltd. in resolving issues.

4.1.3. Complexity

Under IDT, the attribute of complexity is measured by ease of understanding, user-friendliness, and functionality. This section explains the complexity levels of the four IT-based tax payment systems used by LAs in the Colombo District based on these parameters.

4.1.3.1. Easy to Understand

The study revealed that all four systems used by LAs in the Colombo District are not very complicated, from both institutional and customer perspectives, as they are primarily used for tax and fee payments. Only four LAs use the systems for all types of taxes and fees, while the other eight LAs use them solely for rate payments.

Furthermore, although the eLG and Nekfa systems are designed to include additional management functions such as store and human resource management, these functions are not activated or currently used by the LAs.

4.1.3.2. User-friendly Interface

Since the systems are generally not complex, most have a user-friendly interface for both institutional staff and customers. However, some staff and customers have reported that certain processes are lengthy. An officer in Kotikawatta-Mulleriyawa PS noted that entering multiple cheques requires several steps, which

slows the process. Similarly, customers in Seethawakapura UC found the online rate payment process long and not fully user-friendly, prompting the LA to provide guidance via Facebook and leaflets.

4.1.3.3. Functionality

At the organizational level, staff are assigned user accounts with access levels based on their duties. For rate payments, each property under an LA is assigned a unique property ID. The officer in Maharagama UC explained that property IDs were created for all 95,520 rate units and printed on rate notices, enabling customers to easily search their property details. This directs users to a page showing total value, quarterly payments, and amounts already paid. All systems allow customized payments. The officer in Dehiwala-Mount Lavinia MC illustrated:

> *"If a person has to pay Rs. 12,000/- of total value as Rs. 3,000/- for one quarter and he/she does have only Rs. 10,000/- on his/her hand, he/she can pay that money by customizing his/her payment"* (An officer in Dehiwala-Mount Lavinia MC).

After payment, customers receive receipts via email or download PDFs. Maharagama UC also sends SMS confirmations. Sri Jayewardenepura Kotte MC and Homagama PS use the eLG system, initiated by the Ministry of Provincial Councils and Local Government with ICTA support to improve efficiency, accountability, inclusiveness, and revenue collection. Developed in two phases—covering tax collection, licenses, permits, and certificates first, then other LA activities, the eLG system was introduced in 2014. Initially, LAs collaborated with ICTA and the contracted company, Hsenid (later Cicra Solutions), for Business Process Reengineering (BPR). After ICTA exited, Homagama PS signed a direct agreement with the company in 2018. Data entry was manual during the first year, and the system's functioning later became similar to Emetsoft. LAs using Nekfa, recommended by the Western Provincial Council, also operate similarly to Emetsoft.

4.1.4. Trialability

In the IDT, the attribute of trialability is measured by parameters such as pre-testing, testing, and access to online public services. This section, therefore, focuses on how pre-testing and testing were conducted in the four systems mentioned above in the LAs, as well as the availability of online access for paying taxes and fees.

4.1.4.1. Pre-testing and Testing

All systems undergo pre-testing before launch. Notably, the system used by Dehiwala-Mount Lavinia MC was checked by the Sri Lanka Computer Emergency Readiness Team (SLCERT), which ultimately awarded a certificate for the security of the payment gateway. As the Officer of Maharagama UC explained, the trialability

of the system is evident from the rigorous pre-testing conducted there. The system was tested by SLCERT through 14 cyber-attacks to evaluate its security. An assessment report identified five risks, two low and three medium, which were addressed through system redevelopment. Currently, the payment system employs three security measures: capture, Windows fire, and a one-way gate system, earning Maharagama UC the distinction of being the only LA with an SLCERT-certified payment gateway.

4.1.4.2. Access to Online Public Services

Although Dehiwala-Mount Lavinia MC and Moratuwa MC have used the system for all tax and fee payments since 2018, the online payment facility was only made available from 2020 for rates, shop rents, trade tax, and trade licenses. From 2018 to 2020, for all other tax payments, customers had to come to the office physically. Even then, bills were issued from the system without using handwritten documents.

Since Maharagama UC introduced the IT-based and online tax payment system recently in 2023, and it is currently limited to rate payments, customers must visit the UC physically for other tax and fee payments. Before 2023, Maharagama UC relied entirely on manual methods, requiring customers to come in even for rate payments. The new system now facilitates online rate payments. However, the lack of an online facility for all taxes and fees, which would allow remote payments, remains a significant disadvantage for customers.

Sri Jayewardenepura Kotte MC, Homagama PS, and Kotikawatta-Mulleriyawa PS initiated online payment systems in 2018, while Kaduwela MC, Kesbewa UC, Boralesgamuwa UC, and Seethawakapura UC started in 2021. Similar to Maharagama UC, Kolonnawa UC launched its online payment system recently in 2023. All these systems are currently limited to rate payments.

4.1.5. Observability

According to the IDT, observability is measured by the parameters of knowledge and awareness campaigns and the adequacy of resources. Therefore, this section elucidates the status of observability of the four (04) systems, focusing on these parameters.

4.1.5.1. Knowledge and Awareness Campaigns

ICTA, Emetsoft (Pvt) Ltd., Cicra Solutions, and Nekfa Australia (Pvt) Ltd. conducted initial training programs to help the LAs start using the systems. Later, office staff were responsible for training newcomers on the tax payment system. The LAs have also guided customers in using these systems. For example, Maharagama UC uploaded a step-by-step instructional video and PDF on its official website and

YouTube channel, enabling anyone to process payments independently, with all necessary guidance and facilities provided.

4.1.5.2. Adequacy of Resources

All LAs emphasized the need for new equipment, such as computers, printers, and routers, to ensure uninterrupted operations. The Officer in Homagama PS noted that old computers and broken printers hinder the process, stating, *"Our computers are old, and some printers are already broken. We need at least two printers next year. If not, we cannot continue the process."* Similarly, the Officer in Maharagama UC explained that infrastructure development is necessary, and after receiving approval from the Western Provincial Council and the administrative council of Maharagama UC, they plan to purchase new computers this year, as the existing machines are insufficient and outdated.

Additionally, the Officer in Kotikawatta-Mulleriyawa PS highlighted a lack of IT knowledge among staff, which forces them to rely on Nekfa Australia (Pvt) Ltd. for system-related work. The officer explained,

> *"There are no officers here who have IT knowledge at a satisfactory level. Therefore, we have to depend on the company always. Also, we have to accept what the company said because we cannot understand the technical part of the system"* (An officer in Kotikawatta-Mulleriyawa PS).

4.2. Summary on Strengths, Weaknesses, Opportunities and Threats (SWOT) of IT-based Tax Payment Systems

Summarizing the analysis, the following SWOT can be identified for IT-based tax payment systems in Local Authorities in the Colombo District.

Strengths	Weaknesses
• Established IT-based tax payment systems with online payment facility (mainly rate payments; some mixed-income sources). • Able to handles multiple customers simultaneously. • Eliminate handwritten bills. • Reduces queues. • Acts as a database with detailed customer/payment history. • Allows customized payment amounts. • Quick, accurate report generation.	• IT-based and online systems are mostly limited to rate payments. • Occasional system errors and calculation anomalies (discounts, etc.). • Limited report formats. • Multi-steps and non-user-friendly processes. • Inadequate IT equipment and infrastructure. • Lack of IT-skilled human resources

- High data accuracy and staff access-level controls.
- Traceable staff activities and improved transparency.
- Automated customer notifications (email/SMS).

Paperless environment and administrative trust in digital systems

Opportunities	Threats
• Institutional commitment to system improvement. • Alignment with national digitalization strategies (Digital Sri Lanka). • Streamlined service delivery and improved public perception. • Standardization across LAs and intergovernmental data sharing. • Upskilling of staff and workforce modernization. • Public–Private Partnerships (PPP) and inter-LA collaboration. • Academic/research collaborations and international assistance. • Multi-stakeholder investment in digital infrastructure.	• Weak/unstable relationships with system developers. • Delays from service providers. • High costs for further enhancements from service providers. • Dependence on external vendors. • Public distrust and negative attitudes toward online payment. • Cybersecurity threats. • Policy instability and lack of central coordination/support.

Overall, the SWOT analysis indicates that the strengths of IT-based tax payment systems in Local Authorities are highly significant. Therefore, implementing these systems positively impacts the functionality and performance of the LAs.

4.3. Strategies for Enhancing Effectiveness and Efficiency in Existing IT-based Tax Payment Systems

According to the research findings presented in Figure 01, strategies to enhance the effectiveness and efficiency of existing IT-based tax payment systems in LAs can be addressed through three aspects: structural development, educational development, and attitudinal development.

4.3.1. Structural Development

Under the structural development, the LAs should consider the following:

- Expanding the system to enable customers to make payments for all mixed-income sources as well.

- Correcting identified errors in the system.
- Ensuring the security of the online payment facility and obtaining the SLCERT certification.
- Developing IT infrastructure

4.3.2. Educational Development

Under educational development, the LAs can take the following steps to improve the knowledge of both organizational staff and the public regarding IT-based tax payment systems:

- Conduct awareness programs for the public on how to make online payments through the system.
- Distribute leaflets to the public explaining the online payment process.
- Conduct social media campaigns through platforms such as Facebook, YouTube, and Instagram.
- Upload clear instructions on the official website and within the online payment system so that customers can easily understand the steps to follow.
- Provide advanced IT training to LA staff and select capable officers who can think critically and propose appropriate development solutions for the system.

4.3.3. Attitudinal Development

Attitudes toward online tax payment systems should be improved among both organizational staff and the public to facilitate further developments. To achieve this, LAs can adopt the following strategies:

- Conduct awareness programs for the public, highlighting the benefits of the system.
- Display the progress of online payments on official websites and digital screens.
- Conduct training programs for organizational staff on how to coordinate effectively with private parties involved in system development.

5. Discussion

According to the MCs and UCs Ordinances and the PSs Act, the LAs have been established to regulate, control, and administer all matters related to community well-being, public utility services, and community access, as well as to safeguard and promote the welfare, facilities, and prosperity of the people. Each LA is responsible for generating the necessary funds to provide these services to the public. In this process, LAs are authorized to collect taxes and fees from the public to generate income. However, most LAs have traditionally relied on manual methods for tax collection, which are inefficient both institutionally and for the public.

In the Colombo District, there are 12 LAs that have implemented some form of IT-based system to manage the tax collection process. This study evaluated the efficiency and effectiveness of those systems using a SWOT analysis based on the attributes of IDT. The discussion below integrates the findings of this research with the broader academic literature presented in the literature review section.

This research revealed that IT-based tax payment systems in the LAs of the Colombo District have brought several benefits, particularly in improving service delivery, enhancing efficiency, ensuring accurate record-keeping and report generation, saving time, and streamlining processes. These findings are consistent with those of Ihenyen et al. (2022), Wadesango et al. (2024), Olaoye et al. (2025), and Okunogbe and Santoro (2023), which confirm that digital systems facilitate timely revenue collection, improve internal record-keeping, and enhance organizational transparency. According to the present study, none of the LAs issue handwritten receipts for rate payments, indicating a positive sign of digital progress in Sri Lanka's tax management process.

Despite these strengths, the study also identified several weaknesses in IT-based tax payment systems. Most of these systems and their corresponding online payment facilities are limited to rate payments, while manual processes continue for other types of taxes. This reflects partial fragmentation in the digital transformation of tax payments in the Colombo District. Weaknesses such as system errors, limited reporting functions, and inadequate IT literacy among staff mirror trends seen in other developing countries. Owusu et al. (2023) and Islam et al. (2024) identified similar issues related to limited IT capacity, while Hans and Rutenge (2024) and Mekonen et al. (2025) pointed to infrastructural limitations as barriers to effective e-governance. Okunogbe and Santoro (2023) also observed fragmented digital transformation, consistent with the situation in Colombo District LAs.

Encouragingly, the research found that there are substantial opportunities for improvement in IT-based tax payment systems within Colombo District LAs, particularly through enhanced policy coherence, institutional alignment, and stakeholder engagement. These findings align with those of Hans and Rutenge (2024), who emphasized that IT-based processes must be supported by investments in infrastructure, comprehensive training programs, adequate funding, and effective change management strategies to achieve long-term success. Similarly, Islam et al. (2024) stressed that the success of e-government projects depends on government support, a sound legal framework, and adequate infrastructure.

However, the findings also revealed several notable threats, including weak coordination between LAs and system developers, continuous dependence on external vendors, and public distrust in online payment systems. These challenges

correspond with the findings of Okunogbe and Santoro (2023), who identified lack of trust and security concerns as major obstacles. Attitudinal resistance among both staff and the public further complicates the adoption of IT-based systems. As Shaikh et al. (2019) and Jamshidi and Kazemi (2019) argue, drawing on IDT, cognitive and emotional factors such as trust, awareness, and satisfaction play a critical role in technology acceptance, particularly in service-oriented platforms.

Based on the SWOT results, this study proposes a three-dimensional improvement strategy, Structural Development, Educational Development, and Attitudinal Development to enhance the effectiveness and efficiency of IT-based tax payment systems. Structural development focuses on system expansion, infrastructure upgrades, and achieving certification standards such as SLCERT to strengthen security, aligning with the recommendations of Olaoye et al. (2025) and Okunogbe and Santoro (2023). Educational development focuses on both citizens and staff, aiming to enhance system awareness, confidence, and IT competence. This aligns with findings from the Kenyan case (Kiambati et al., 2024), where accessibility to digital systems was strongly influenced by prior training and user understanding. Attitudinal development addresses deeper behavioural aspects of adoption, emphasizing the importance of transparency, communication, and staff engagement, in line with the findings of Holland (1997) and broader IDT literature.

6. Conclusions and Recommendations

According to the SWOT analysis based on the five (05) attributes of IDT relative advantage, compatibility, complexity, trialability, and observability the IT-based tax payment systems in LAs demonstrate notable strengths, including a systematic structure, user-friendly interface, efficiency, and data accuracy. However, weaknesses such as limitations on rate payments, system errors, lack of user-friendliness, and restricted report generation persist. Opportunities lie in future system expansion and supportive government e-governance policies, while threats include dependence on developers, inadequate IT infrastructure, and limited staff IT literacy. Overall, the systems have a significant positive impact on LA functionality and performance. To further enhance effectiveness and efficiency, this study proposes strategies under three key areas: structural, educational, and attitudinal development.

6.1. Limitations of the Study

Despite its practical and theoretical contributions, this study has a few limitations. First, it focuses only on the Colombo District, which may not represent conditions in other, especially rural, areas. Second, it considers only the organizational perspective, excluding citizen viewpoints. Third, its reliance on a single theoretical framework the IDT may narrow the analytical scope.

6.2. Directions for Future Research

Based on the findings of the study, several future research directions emerge. Future studies could extend the analysis to include both rural and urban LAs, incorporate citizen perspectives, and assess the feasibility of adopting standard protocols and APIs. They could also examine the potential for implementing IT-based systems in areas with limited digital infrastructure and apply alternative theoretical frameworks beyond the IDT to gain deeper insights into technology adoption and organizational change in LA digitalization.

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