Utilization of Information and Communication Technology in Addressing Property Tax Collection Challenges: The Case of Tanzania

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Abstract. The paper explores the current challenges faced in the collection of property tax and conceptualized the Information and communication technology solution to address some of the identified challenges. By addressing the identified challenges, this research will enable the government to collect more revenues from property taxes to be used to undertake development projects. A case study approach was used to gather information from two regions, Dodoma and Dar Es Salaam whereby a total of 150 building owners, 10 property tax collectors and 10 systems administrators were purposively selected to respond to the questionnaire and Interviews. The findings showed that property tax collection is still facing several challenges, such as lack of comprehensive taxpayer's education programme, higher property tax collection costs, a significant number of property tax defaulters, time-consuming payment method and impractical enforcement measures. In addressing some of these challenges, a framework that utilizes the prepaid metering system used by Tanzania Electricity Supply Company to provide electronic property tax enforcement mechanisms has been proposed by this study. The Design Science Research paradigm was used to aid the design of the framework.

Keywords: Property tax · Information and communication technology · Tanzania Revenue Authority · Local Government Authorities

1 Introduction

Property tax has been taken as among of the potential sources of revenues in many governments including Tanzania because it is visible to taxpayers and is linked to improved local services. Still, property tax generates limited revenues due to resistances it faces from property owners. The use of appropriate Information and communication Technology (ICT) systems can help to overcome the resistances through improved services including e-services and e-payment options which simplify tax paying processes [1]. Before utilizing IT systems in revenue collection, LGAs depended on manual systems by making a use of manually prepared receipts, bills and ledgers. Challenges including high cost of collection, leakages of revenues, fraud and corruptions and improper tax data management were evident [2, 3].

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Central and local level governments have been struggling to install and use ICT systems in order to improve their own source revenue collections (OSRs). The overall goal is to be modern in their utilization of ICT so that they can operate effectively and efficiently [4, 5].

In recent years in the efforts to raise more revenues from property taxes, the government of Tanzania has gone through several transitions by shifting the collection and administration of property tax between the central government through Tanzania Revenue Authority (TRA) and Local Government Authorities (LGAs).

The first transition happened in the year 2008 whereby the government decided to shift the collection and administration of property tax from LGAs to TRA as a measure to collect more revenues from this source. This measure did not bring the expected impact due to a lack of cooperation and coordination between TRA and LGAs [6]. The lobbying imposed by municipalities under the support of the Association of Local Government Authorities in Tanzania (ALAT) convinced the government to announce the return of property tax collection to LGAs in February 2014. This reform only lasted for two years before the decision of again returning the responsibility to TRA in July 2016 was made [7]. In February 2021, the government again shifted the administration of property tax back to LGAs.

These transitions are evident that the collection of revenues from property taxes in Tanzania is still facing several challenges and therefore this paper analyses the challenges in property tax collection and proposes an integrated Information and Communication Technology (ICT) system framework to address some of the analyzed challenges.

The widespread use of ICT systems in tax collection and administration results in strengthening tax collection practices by enabling gathering of appropriate information. ICT allows tax processing movement from paper based processing to electronic based tax documents which facilitate better monitoring and enforcement to defaulters. ICT helps to achieve advanced arrears recovery methods and detection of fraud. With tax sources like property tax whereby noncompliance brings a greatest risk to revenues, utilization of modern ICT systems can greatly help to overcome the problem [8].

2 Literature Review

A good tax collection system allows for the collection of more revenues with minimum collection costs using fewer resources. The proper use of ICT can help to meet these constraints concerning revenue mobilization. Many types of research have been conducted on the role of ICT in revenues administration which has brought significant positive effects in revenue collections.

In 2018 India introduced new ICT tax system in taxes and goods which had its impact in raising the number of registered properties and taxpayers by nearly 38% over the present number in less than one year of its introduction. The big advantage of using this ICT infrastructure is that taxpayer's individual data can be aggregated in powerful ways and individual footprints can be established which help to build up a profile of taxpayers' total income [9].

The study conducted in Ghana revealed that the introduction of the Local Government Revenue Mobilization System (LGRMS) containing Geographic Information System

(GIS) helped to reduce tax administration costs and increased effectiveness in revenue collection [10].

The proper application of ICT systems in Malawi and Sierra Leone in revenue collection resulted in administrative efficiencies and other advantages such as better flow of information to support the planning of urban areas, accountability and transparency regarding collected revenues [11].

The introduction of the e-Citie Programme by Kampala Capital city Authority (KCCA) simplified revenue collection processes by easy registration of properties and payment processes [12].

The improvement of ICT infrastructures in Nepal revenue authorities has resulted in easy process of submission of tax returns. The provided electronic-services has enhanced access to appropriate data and uplifted data transparency. The online property registration and electronic-filing of tax returns reached 100% in 2016/17 [13].

The use of Integrated Financial Management Information System (IFMIS) introduced by the National Treasury in Kenya has enabled efficient resource allocation, budget formulation and execution, internal and external audits, public procurement and revenue collection. The system also enables the integration and interface with other subsystems such as those in the Central Bank of Kenya and the Kenya Revenue Authority which enhanced tax collection process [14].

In 2016/17, Tanzania through President's Office-Regional Administration and Local Government (PO-RALG) rolled out the Local Government Revenue Collection Information System (LGRCIS) national wise to all 186 LGAs. LGRCIS improved collections within LGAs. The Improvements introduced by LGRCIS includes accurate data about taxpayers, easy preparation of demand notices and production of electronic receipts [15]. The study conducted in Arusha, Tanzania found that after the implementation of LGRCIS in FY2013/14 to support the Administration of revenue, the revenue data in Arusha City Council showed a clear association between the use of the system and improvement revenue collections. There was an increase in own-source revenue by 227% in the period FY2012/13 to FY2015/16 [16].

With all the systems used in revenue collection and administration, property tax is still not fully exploited. The available systems can improve revenue collection transparency, help in identifying property tax arrears and provide the basis for effective budgeting, but they lack an enforcement mechanism which is often a missing critical element in the administration of local revenue [16]. Decent ICT systems, attached with comprehensive enforcement measures, can help to overcome many challenges and results in improved OSR collections [15]. The study conducted in Tanzania on how LGAs utilizes ICT in property tax administration and collection proposed a computerized property tax enforcement model [17]. The model proposed only considered the buildings as the only property to be enforced and did not consider land as also a property in terms of tax collections. Hence, the framework proposed by this study extends the capability of this model to accommodate land rent.

3 Methodology

3.1 Study Design

The study adopted a case study design to examine how TRA and LGAs utilize the potentiality of the ICT in property taxes and how TANESCO utilize the prepaid metering system to charge customers for using electricity service. The case study approach was found suitable for this study due to its capability to allow the use of multiple sources of evidence to increase the quality of data through validation of one source of data by another source while at the same time bringing into direct contact the investigator and the case being investigated [18].

The Design Science Research (DSR) paradigm was used in designing of the framework. DSR seek out in developing and designing solutions for improving existing systems, solving problems, or even creating new artifacts which contribute to better performance of human, ether in organizations or in society [19].

3.2 Sampling

The purposive sampling was used in this study by selecting two City councils namely Dodoma City Council and Kinondoni City Council. Dodoma City council is selected because of the existence of the Prime Minister's Office – Regional Administration and Local Government (PMO-RALG) responsible for the development of the ICT system used for revenue administration. The selection of Kinondoni City Council is based on the presence of TANESCO headquarters for easy collection of data about the prepaid metering system. Also, purposive sampling was used to sample 150 building owners,10 tax collectors and 10 systems administrators for collecting data about property tax collection challenges and data about information systems.

3.3 Data Collection Methods

Both secondary and primary data were used for the study. The sources of secondary data used to provide a deeper understanding of the key concepts, and components include books, publications, articles, reports, manuals and the Internet. The primary data about property tax collection challenges were collected from selected building owners and tax collectors in Dodoma and Dar es salaam through interviews and questionnaire. The primary data to aid the design of the framework was collected through interviews with selected system administrators in TANESCO, TRA, LGAs and PO-LGAM.

3.4 Data Analysis

Data Analysis was done with the use of both qualitative and qualitative techniques depending on the method used to collect the data. Descriptions, observations and explanations to emphasize some of the principal issues about the study was used for qualitative analysis and statistical software SPSS was used to analyze quantitative data.

4 Results and Discussion

This section discusses the current property tax collection challenges resulted after the analysis of data collected from property owners using questionnaires in the selected wards. A total of 150 property owners responded to the questionnaires of which a big percentage (65%) of the respondents owned residential buildings. The rest of the respondents were the owners of commercial and residential and commercial buildings as shown from Fig. 1.

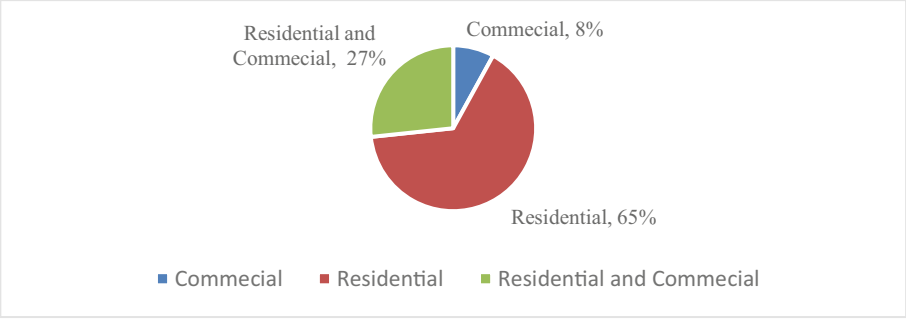

Fig. 1. Building owners by category

Out of 150 respondents, 11% never paid property taxes and 89% are paying property tax as shown in Fig. 2.

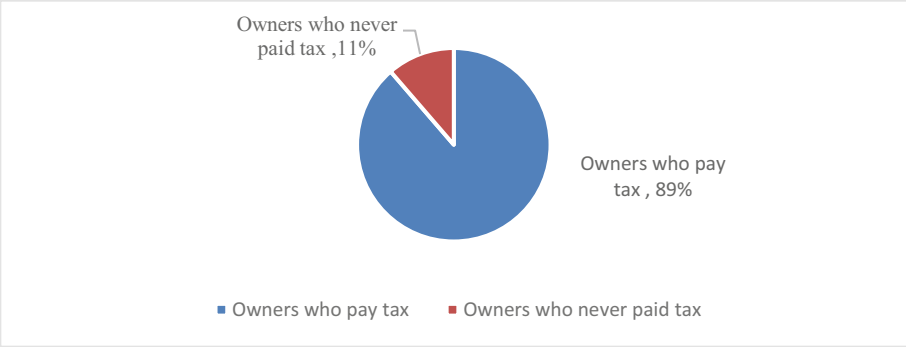

Fig. 2. Building owners' property tax payment characteristics

A building owner who never paid property tax when responding for the reason of not paying, the majority said that they never received demand note from the authority. This implies that there some of the buildings which are eligible to be charged property tax but are not yet registered by the authority.

When finding out about challenges on property tax administration and collection, the results showed five categories of challenges which are lack of comprehensive taxpayers' education programme, higher collection costs, inconvenient payment methods, a significant number of property tax defaulters and impractical enforcement measures.

Lack of Comprehensive Taxpayers' Education Programme

During data analysis on this theme, it was found that 93% of respondents who responded on knowing property tax, obtained the knowledge from governments advertisements through media. Less than 5% indicated getting information about property tax through the meeting and seminars held by local government officers as shown in Table 1. This shows that local government officers are rarely putting taxpayers' education agenda in their regular meetings to educate the taxpayers about the importance of paying taxes as the result people are paying taxes to comply with government rules and regulations instead of paying willingly for the government to undertake development projects. These results are in line with a survey conducted in Tanzania about the knowledge of taxpayers which reported that the majority of respondents had trouble in figuring the importance of taxes to the government [20]. Lack of knowledge and education about tax is among the crucial obstacles to taxpayers to comply voluntarily [21–23].

Table 1. Medium of disseminating taxpayers' education

Medium of information	Yes		
	Frequency	%	
Through meetings held by local government officers	2	1.3%	N = 150
Through seminars hosted by local government officers	2	1.3%	
Through house-to-house visit by local government officers	5	3.3%	
Through government announcements in media	140	93.3%	
I heard from my colleague	0	0%	

Higher Collection Costs

During the interviews sessions with tax collectors in TRA about the way, demand notices are distributed 95% of the respondents commented that the distribution of demand notices to defaulters is done manually through the house to house visits. This method is imposing a lot of collection costs since the authority has to mobilize some resources including transport, labour and time of which the response from taxpayers after this exercise to come and pay their dues still is not significant to justify the cost incurred.

Inconvenient Payment Methods

On responding to the available payment methods, 68% and 65% of building owners in Dar es Salaam and Dodoma respectively who pay property taxes indicated that the commonly available method of payment is through banks. None of the building owners in both regions were using mobile money transfer to pay property taxes as indicated in

Table 2. This agrees with the findings which reported that the majority (74%) of property owners paid the property tax to TRA through bank transfers [24].

Table 2. Methods of property tax payment

Payment method	Dar Es Salaam		Dodoma	
	Frequency	%	Frequency	%
By bank deposit	68	100%	65	100%
By mobile phone	0	0%	0	0%
Total	68	100%	65	100%

When asked to comment about this payment method they are using, 85.3% and 93.8% of building owners in Dar Es Salaam and Dodoma respectively commented that this method of payment is time-consuming which is one among the constraints in paying taxes. This is because of the long waiting queues in TRA and in banks especially at the peak period of paying taxes. Very few building owners 8.8% in Dar es salaam said this method of payment is simple and 5.9% of respondents in Dodoma said this payment method is costly as shown in Table 3.

Table 3. Perception of building owners about available payment method

Payment method perception	Dar Es Salaam		Dodoma	
	Frequency	%	Frequency	%
Simple	6	8.8%	0	0%
Time consuming	58	85.3%	61	93.8%
Difficult	0	0%	0	0%
Costly	4	5.9%	4	6.8%

Significant Number of Property Tax Defaulters

When analyzing data on the accumulation of property tax arrears, the results show that 38.2% and 44.6% of property owners in Dar es Salaam and Dodoma respectively are not paying their taxes in every financial year as shown in Table 4. This is a significant number and can be among the key reasons for the lower collection of revenues from this source. The findings are in line with the results of the study conducted in two municipal councils Temeke and Ilala in Dar Es Salaam, Tanzania which showed that for the fiscal year 2015–2016, the arrears were 31% and 32% respectively of the estimated revenues from property tax [24].

Table 4. Property tax payment behavior among property owners

Frequency of Tax Payment	Dar Es Salaam		Dodoma	
	Frequency	%	Frequency	%
Every year	42	61.8%	36	55.4%
After some years	26	38.2%	29	44.6%

Impractical Enforcement Measures

In responding to the measures taken against building owners who did not pay their taxes for a particular year, the majority 73.1% of defaulters in Dar es Salaam and 44.6% of the defaulter in Dodoma default said that nothing happens to them when they do not pay. About 26.9% in Dar Es Salaam and 13.8% in Dodoma responded to being denied other municipal services if they accumulate arrears as indicated in Table 5. This implies that some of the administrative and legal enforcement measures provided by law such as taking defaulters to court, seizure of personal movable property and publishing of defaulters' name are not frequently applied to enforce defaulter which provides room for taxpayers to accumulate arrears.

Table 5. Measures taken by the authorities against property tax defaulters

Action taken to defaulters	Dar es salaam		Dodoma	
	Frequency	%	Frequency	%
Take me to court	0	0%	0	0%
Nothing happens to me	19	73.1%	29	44.6%
Denied municipal services	7	26.9%	4	13.8%

5 Property Tax Enforcement Framework

All property tax collection challenges analyzed in this study can be solved if a proper enforcement mechanism is put in place. By nature, when it comes to the issue of tax very few people will comply willingly. The majority of people pay taxes when there is a way of enforcing them to pay.

The current used property enforcement frameworks involving withholding of some of municipal service has been an effective way for enforcing compliance for some of the countries. For example, in South Africa where they buy water and electricity in bulk from regional or national service providers and sell to consumers as a service of the municipal, they have been enforcing the payment of property taxes overdue by reducing the pressure of water and cutting the electricity supply. In most African countries where electricity and water is not a municipal service, have been enforcing defaulter by withholding of business licenses and building permits until property tax arrears are paid [24].

Although the cutting of electricity and water services has been effective to some countries in enforcing property taxes, these measures still have cost implication since municipal officers have to go around the streets and to disconnect the services to the defaulters. With holding of other services like business licenses does not apply to property owners running no any business. However, the implementation of the framework proposed in Fig. 4 will eliminate all these drawbacks of the current enforcement measures and will be a useful way to claim arrears.

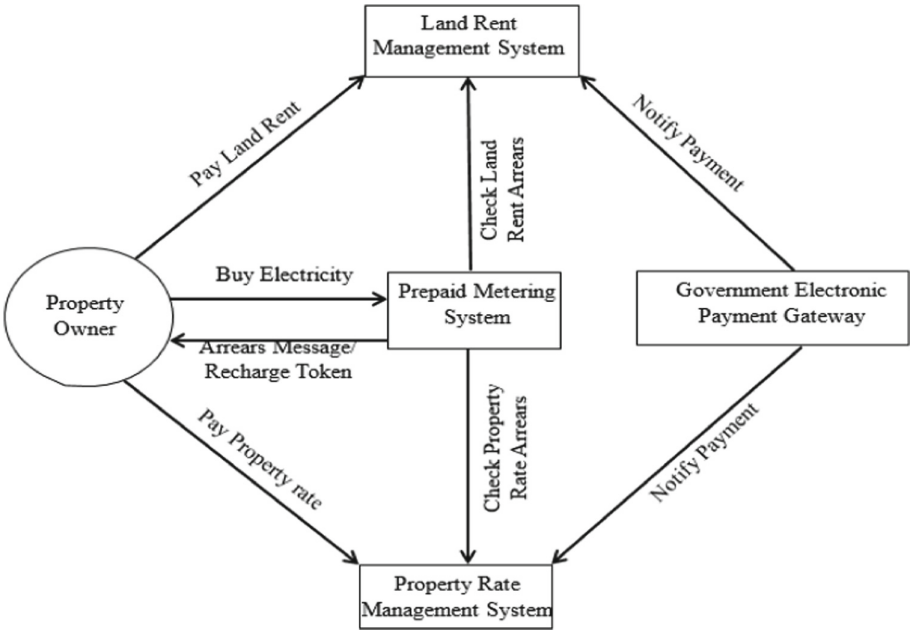

Fig. 4. Property tax enforcement framework

The framework shown in Fig. 4 interoperates four information systems namely Prepaid Metering System (PMS), Property Rate Management System (PRMS), Land Rent Management System (LRMS) and Government Electronic Payment Gateway (GePG) to provide electronic property tax enforcement mechanisms. The Application Programming Interface (API) will be used to aid the system communication between the sectors included in the framework. All the systems are connected to the national ICT broadband backbone network which will guarantee reliability, speed and security during data transfer. In case of network failure leading to some sectors not reachable, the framework will use the request queuing mechanism which will automatically reconnect to the sector when the network is available and respond to the clients accordingly.

Prepaid Metering System

A prepayment metering system is a system whereby an electricity meter with an inbuilt disconnecting device is installed in the customer's house. The customer in advance buys electricity and when the number of units purchased become exhausted the meter

disconnects the customer from electricity services automatically. The reconnection is only possible if the customer buys more electricity and recharge the meter.

This system is the heart of this enforcement framework. Before the recharge token is returned to the property owner, the system must first connect to the PRMS and LRMS to check if the house and/or the plot in which the house is constructed has property tax arrears. In case any arrears is found, the appropriate message will be returned to the property owner directing him/her to clear property tax arrears first to continue using electricity services. If no arrears are found, the system will return the electricity recharge token to the property owner.

Property Rate Management System
PRMS is the one used for administration taxes collected from buildings/houses. It keeps records about the building owner information and the yearly property tax amount to be paid by that building. For this framework to be able to work, the key information about the prepaid meter connected to the building will also need to be recorded in the system.

Land Rent Management System
LRMS is a system used to administer revenues collected from owners of land/plot. The system keeps the information about the owners of the plot and the yearly rent to be paid to that plot according to the rates set by the authority. Also for the sake of this framework, the key information about the prepaid meter connected to the house constructed on that plot will need to be recorded in this system.

Government electronic Payment Gateway
The GePG in this framework is used to enable the public to government electronic money transactions. It is a centralized system, connected to all available electronic revenue collection channels. With this framework, no changes need to be done in this system. Its purpose is to provide feedback to the systems when the payments are made.

Limitation of the Designed Framework
The buildings using other energy like solar energy and not connected to the prepaid metering system will not be captured by the framework. Also, the plots which are not developed will not be captured by this framework. Under these circumstances, the existing administrative and legal enforcement measures can be used for enforcement. But with the current efforts of LGAs to identifying all properties and to make sure all properties owners get legal ownership documents, the proposed framework will be more useful and at big percentage reduce the collection costs incurred by the authorities to enforce and collect revenue from this source.

6 Recommendations and Future Work

For the effectiveness of the proposed property tax enforcement framework, the authorities responsible for property tax administration and collection should emphasize the use of mobile money transfer payment methods. This method is more flexible to taxpayers as they can pay their dues anywhere at any time as opposed to the bank transfer payment method which requires taxpayers to visit the bank branches and agents. The implementation of the proposed framework is an area for future work.

7 Conclusion

This study indicated that lack of comprehensive taxpayer's education programme, higher property tax collection costs, a significant number of property tax defaulters, time-consuming payment method and impractical enforcement measures are the major challenges currently facing the property tax collection and administration in Tanzania. In addressing some of these challenges using ICT, the paper proposed a framework that interoperate different information systems used in property tax collection to provide electronic enforcement mechanism achieved through the use of electricity prepaid metering system used by TANESCO. Through this framework, once the customer request for electricity recharge token, the prepaid metering system which is responsible for delivering the recharge token will first connect to the property tax collection systems to check for property tax arrears before delivering the token to the customer. This framework will eliminate the property tax collection costs and property tax defaulters by forcing taxpayers to pay their dues in time through mobile money transfer method and hence this will result into increased revenues from property taxes.

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