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# Automation of Property Tax Collection using Information and Communication Technology: the Case of Local Government Authorities in Tanzania

Justuce M Gration, Kennedy Oriko, Benedict Anselmi

***Abstract*—**Local Government Authorities (LGAs) in Tanzania have been working hard to solicit different sources of revenues so as to fulfill their mandated obligation of delivering community services. Internal sources which include taxes and non taxes are the potential sources of revenues in most of LGAs in Tanzania, but they have been facing many challenges during revenue collections from these sources common one being unwillingness nature of most of people in paying taxes. This paper explores the current procedures used by LGAs in Tanzania in the administration of property tax and the resulting challenges. In addressing some of these challenges using Information and Communication Technology (ICT), this paper proposes a system model which automates the property tax collection processes by utilizing prepaid energy metering system used by Tanzania Electrical Supply Company (TANESCO) to charge customers for electrical consumption. A survey from a sample of 5 Local Government Authorities (LGAs) on the current property tax administration procedures shows that buildings are identified through periodic field surveys and billing, collection and enforcement are the responsibilities of the Treasurer's office. With the exception of Councils in Dar Es Salaam which introduced computerized billing systems, all tax demand notices are produced and delivered manually through ward executive officers or postal system which cause a problem of delay due to lack of enough resources .

***Keywords*—**Information and communication technology, Property Tax, Local Government Authorities, Prepaid Metering System, Property Tax Database system.

## I. INTRODUCTION

In struggling to transfer political, administrative and financial decision making powers to Local Government Authorities (LGAs), the Government of United Republic of Tanzania has been implementing Local Government Reform programs since 1998. The overall objective being to reduce poverty through improved services delivery at the local levels. In the Local Government Reform Programme Phase II - Decentralization by Devolution (D by D), LGAs have been required to finance local development programmes with revenue generated at in their area of jurisdiction. But this fiscal decentralization programme of the central government to delegate fiscal obligations to the local councils to undertake development projects became a major challenge as a result of lack of investment capital at the local level .

To overcome the challenge of lack of capital at the local levels, the government through Local Government Finances Act gave mandate to LGAs to define their own local tax structure and freely raise their own revenues internally from various sources comprising both taxes and non taxes [1] . Tax sources include property tax, service levy and produce cess while licenses, fees, charges and other revenues are considered as non tax revenue. Beside the aforementioned internal sources LGAs also collect revenue from various external sources including Borrowings, grants and aids from donors and central government transfers. Fig. 1 summarizes these sources of revenues.

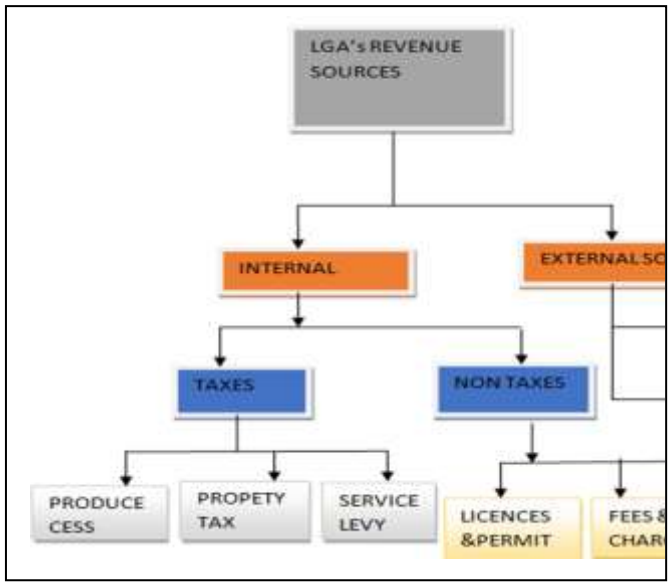


Figure 1. Revenue sources for LGAs in Tanzania [1]

Taxes and non taxes are the potential sources of revenues in most of LGAs in Tanzania, but they have been facing many challenges during revenue collections from these sources common one being unwillingness nature of most of people in paying taxes. This paper explores the current procedures used by LGAs in Tanzania in the administration of property tax and the resulting challenges. In addressing some of these

challenges using Information and Communication Technology (ICT), this paper proposes a system model which automates the property tax collection processes by utilizing prepaid energy metering system used by Tanzania Electrical Supply Company (TANESCO) to charge customers for electrical consumption.

## II. LITERATURE REVIEW

### *A. Property Taxation in Tanzania*

Together with other sources of revenues in LGAs in Tanzania, Property tax has been regarded as a potential source of revenue as it is imposed on the immovable taxable objects which include buildings and structures of the similar nature.. Although property tax has been considered has a potential source of revenue in most of LGAs in Tanzania but its potentiality hasn't been fully exploited due to the number of challenges facing LGAs in collection and administration of this source. These challenges include but not limited to: (1) lack of good and proper enforcement mechanism to property tax defaulters (2) Unwilling of people to pay tax (3)Unaffordable valuation costs (4) Shortage of competent valuation officers, and (5) Lack of sophisticated tools for evaluation process.

### *B. Legal Framework for Imposition of Property Tax*

Urban LGAs and Township Authorities are authorized to levy an ad valorem property tax (Property tax based on the value of the Property) [2]. All the Local Government Authorities in Tanzania may impose any tax, whose rate may be flat to all properties either based on the size, location, use of the property and materials used on their construction [2]. Tab. 1 gives summary of the Acts, imposing sections and the rate prescribed by the given section.

Table 1. The legal basis governing LGAs property tax imposition and rate setting

| **Act** | **Section imposing** | **Description on rate setting** |
|---|---|---|
| Urban Authorities (Rating) Act No.2 ( 1983) | Sec 17 | Urban Authorities are required to impose and raise sufficient revenue from their sources. |
| Local Government Finances Act, 1982, | Sec 16 (1) | allow Flat Rate (No Limit but with Ministerial Approval) |
| | Sec 18 (1)c | Rate based on the property value (No Limit, but with Ministerial Approval) based on market value or replacement cost. |
| | Sec 18 (1), | Councils to enact By-laws stating the rates to used in property tax through Ministerial approval |

### *C. The use of ICT in Revenue Collections*

Tanzania started to apply ICT in 1965 when the first computer (an ICT 1500) was installed at the Ministry of Finance. During that period installation was totally dependent on foreign experts. In some cases these experts were not adequately qualified, and applications tended not to be accurately documented and ran only when foreign experts were around. These experts left the country mainly due to political atmosphere which was created by both the Arusha Declaration and nationalization policies in late 1960's. When computer applications stopped functioning, the government incurred a heavy financial loss and was highly criticized by members of Parliament and the general public. As a result in 1974 the government abolished the importation of computers and their accessories into Tanzania [3]. However, the abolishment covered a period of one decade and was reintroduced in 1984 [4]. After the ban was lifted, both private and public institutions embarked on application of ICT. Different scholars provide alternative views as to why private and public institutions rushed into application of ICT. The speedy generation, storage, retrieval and dissemination of information, which is almost impossible through manual means [5].

ICT provides alternative formats to hardcopy printouts of information which implies easy, faster, and cheaper information storage. This amount of information can be stored in stand-alone computer storage devices or published online and made accessible to intended users [6]. ICT expands the extent to which one can communicate information in terms of the frequency, amount of information to be communicated and distance over which communication occurs [7].

The use of ICT enhances timely access to accurate and relevant information, which is a prerequisite for good planning, programming, implementation as well as monitoring and evaluation which forms the key component in development [8]. The two facts about the use of ICT are, first; ICT has the capacity to increase productivity and create more cost effective output with the same or less inputs and second; Development of ICT applications for business use alter the approach organizations function and eventually, improve their services as well as products [9]. What these scholars are trying to emphasize is that; the spread of ICT use in various sectors brings new opportunities for economic growth and development. New organization design, new markets, new products and improved services are been created which brings with them new sources of revenue.


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On the move towards the use of ICT, Tanzania Revenue Authority (TRA) was not left behind. It created a Directorate of Information and Communication Technology (ICTD) which has the responsibility of embracing ICT usage in all tax operations. Currently, the revenue departments are supported by ICT systems with the most central being the Integrated Tax Administration System (ITAX), Taxpayer Identification System (TIN), Computerized Motor Vehicle Registration System (CMVRS), Customs Administration System (ASYCUDA++) and Computerized Drivers' License System (CDLS). Other support systems for the TRA departments are Integrated Financial Management System (EPICOR), Integrated Payroll, Human Resources System (PEODESY), TRA Messaging System (e- Mail) and other legacy applications [10].

Application of ICT has affected both the design and administration of tax system in Tanzania. There are no more rooms full of clerks posting entries by hand in large ledger books as it used to be; instead there is a widespread use of computers to administer tax. Tanzania Revenue Authority have advanced to an extent of using electronic payments like TISS and EFT, electronic filling of return, as well as portals and websites. To facilitate connectivity to regional and district offices TRA has some of its networks provided by mobile phone companies. These are not only cheaper than the land-based telephone systems, but also convenient as they only require transmitters and booster stations [11].

TRA recorded remarkable achievements after the application of ICT in tax administration. For example; iTAX contributed to improved taxation by speeding up administrative processes, timely monitoring of taxpayers and their penalties and its interests, and increase of revenue and income. In 1996, TRA used to collect US$ 25 million per month but the collection rose to US$300 million per month in 2007. iTaX also enhanced efficiency, data security and even transparency of processes, release of staff from un productive work, and possibility of electronic transfer and exchange of data with government and nongovernmental institutions (e-government). Through iTAX, there is a promotion of equity, communication with taxpayers, preventive impact on corruption and bribery, and impediment on tax avoidance and tax evasion. So, iTaX contributes to fair, effective and efficient taxation and increase on revenue, as well as supporting TRA's vision of becoming a modern tax administration [12]

## III. RESEARCH METHODOLOGY

The study desired an inquiry of the property taxation practice so as to answer the questions of "how" is property tax administered and "why" the councils in Tanzania have not been able to generate the desired revenue from property tax. In order to gain a clear understanding on the property taxation practice in Tanzania, a case study approach was considered appropriate in this study. Case studies are the preferred strategy when "how" or "why" questions are being posed, when the investigator has little control over events, and when the focus is on a contemporary phenomenon with some real life context [13]. Information about property tax administration was gathered from four councils namel; Arusha Town Council, Dodoma Municipal Council, Mbeya City Council and Bukoba Municipal Council. Man to man interviews guided by interview questions was used to collect evidence from 87 councils' property tax administrators and local leaders. The information about the proposed computerized system of property tax collection was obtained through literature review.

## IV. FINDINGS AND DISCUSSION

### A. *Current Property Tax collection Procedures in Tanzania*

Almost all surveyed councils had the same property tax collection modality as shown in Fig 2. The results show that buildings are identified through periodic field surveys conducted by a task force from councils Treasurer's office.

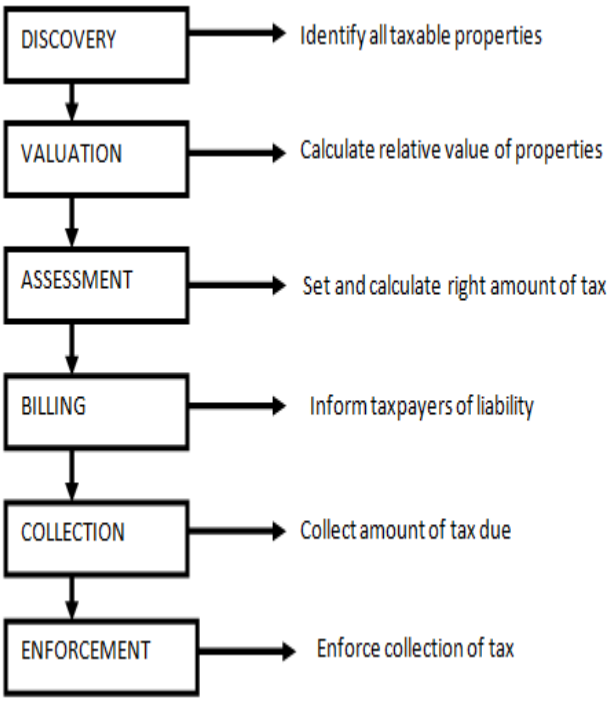


Figure2. Current Property Tax collection Procedures

When responding on how billing and collection are practiced, the results show that all the surveyed councils had the same procedures. The practice is often to deliver all tax demand notices manually through ward executive officers or postal system. This has been causing a problem of delay due to lack of enough human resources and incomplete or outdated addresses and names.

### B. *Availability of staff for Property Tax Collection*

Most respondents commented that their councils have no enough staffs to help in identification taxable properties as the result the tax roll coverage has been incomplete and outdated due to the rapid growing of buildings compared to the frequency of survey. This does not come in line with the


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statement that "The ability to determine the existence of each parcel of taxable property is fundamental for proper functioning of any property tax system" [14]. The results indicate that in almost every LGA visited, most of staff involved with property tax collection considered the staff availability for property tax collection to be insufficient when compared to the rapid growing of buildings to their area of jurisdiction. Tab. 2 and Fig. 3 give the information from respondents regarding to the availability of staff for property tax administration from the visited councils.

Table 2. Staff availability for property tax collection

| Council Name | sufficient | Average | insufficient | Total |
|---|---|---|---|---|
| Dodoma | 3 | 8 | 12 | 23 |
| Arusha | 5 | 4 | 9 | 18 |
| Mbeya | 2 | 6 | 14 | 22 |
| Iringa | 1 | 4 | 8 | 13 |
| Bukoba | 2 | 2 | 7 | 11 |

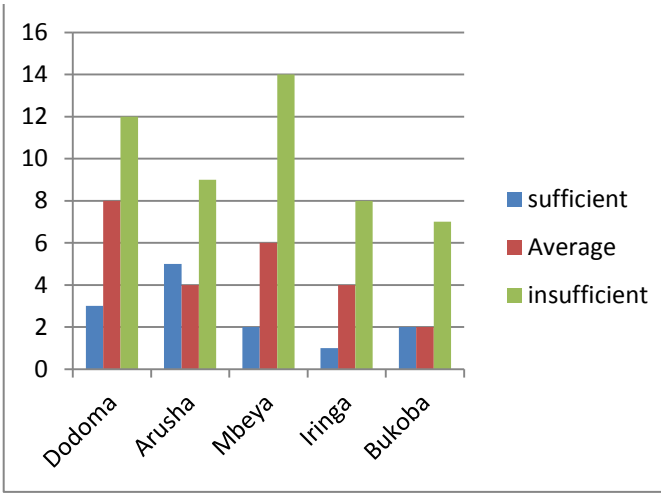


Figure 3. Staff availability summary for property tax collection

*C. Challenges facing Current Property Tax collection Procedures in Tanzania*

A number of challenges were reported by respondents in all surveyed councils which include lack of resources and technical expertise for establishment of property tax database, Payments after the due date and unwillingness of taxpayers to pay tax, resulting in low revenue levels collected from the property tax source. After receiving demand note very few responds willingly the majority are note paying their levies. Respondents also reported on lacking strong enforcement mechanisms to force people to pay due to the nature of the source itself because council's officers cannot close the doors of the house to prevent the owners from entering the house. In order to address some of these challenges especially payments after the due date and unwillingness of taxpayers to pay tax, this paper proposed the computerized system model which can utilize the Prepaid Metering System used by Tanzania Electricity Supply Company (TANESCO) in collecting property tax.

*D. Proposed computerized system Model for Property Tax Collections*

In computerizing the property tax administration, this paper proposes the utilization of prepared metering system used by TANESCO to collect electrical charges from its customers. The idea of automating the property tax collection by linking municipals and townships property tax administration databases with TANESCO's prepaid metering system can be a solution to some of the challenges facing property tax collection in Tanzania. In the near future almost all councils will be connected to the national grid as the result ongoing government project of supply electricity to all rural areas. Since the prepaid meters are installed in homes and the same homes are the ones to pay property tax, then property tax can be easily administered if the database of property tax payers is linked with the prepaid metering system. Fig. 4 shows a block diagram of the proposed system.

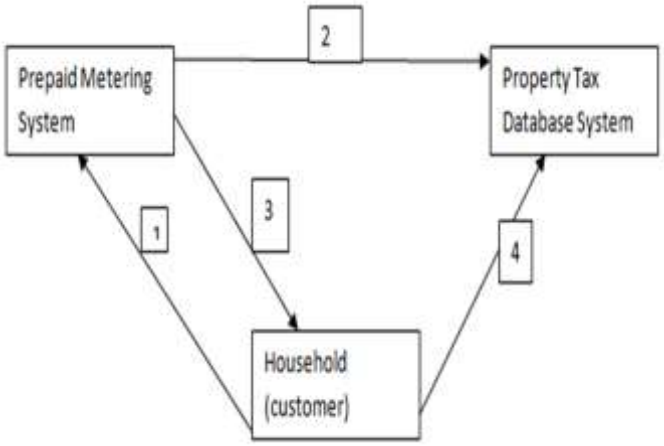


Figure 4. Block Diagram of the Proposed System model

*E. Explanation of the block diagram*

**Step 1**

A customer request for recharge of electricity through mobile phone, agent or TANESCO branch by providing meter number and payment amount

**Step 2**

The Prepaid Metering system connects to the property tax database system to check if the meter number is in the database


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and the expire date of the previous payment of the property tax for that particular meter number

**Step 3**

If the previous payment in step 2 is not yet expired, the prepaid metering system will return the token numbers to customer for recharge, otherwise the message informing the customer to pay the property tax first or to register the building for property tax will be returned

**Step 4**

The customer will utilize the available payment options to pay for property tax first or see the responsible authority to register the building (if not in the database) after receiving a message from prepaid metering system. Otherwise the customer can enter the returned token numbers in the meter to recharge the electricity.

*F. Prepayment metering concept*

Prepaid metering in its simplest form refers to paying for electricity before it is used. The consumer purchases credit and then uses the resource until the credit expires. The concept of prepaid metering is not new, having first been introduced in the form of coin operated gas meters in the United Kingdom well before World War II. Major change took place in the 1980s when electronic or numeric transfer of the credit was introduced.

A traditional electronic prepaid metering system operates on three levels. First are the meters which are installed at the consumer's home. The next level is the vending stations, situated at the utility's offices or at appointed agents. The communication between the vending stations and the meters is in the form of a token, which is used to top up the credit in the meter. Tokens also transfer or download information to the meter, and in some cases upload information (depending on the token choice) back to the vending station. At the top level is the System Master Station (SMS) or master client, which is necessary to ensure a common database for reporting and to provide total management, administration, financial and engineering control. The SMS communicates with the various vending stations via modem or other data link. Information on consumers, tariff changes and so on is communicated to the vending station and detailed customer sales are communicated back up to the SMS [15]. TANESCO came up with the idea of replacing the old postpaid metering system with the prepaid metering system due to the number advantages offered by the later technology. Prepaid energy meter is technique which is cost efficient and can reduce problems associated with billing and also reduces deployment of manpower for taking meter readings. Prepaid energy meter has many advantages both from suppliers as well as consumer's point as summarized in Tab. 3.

**Table 4.** Strengths of Prepaid energy meter

| From supplier point of view | From Customer point of view |
|---|---|
| • Pay before use<br>• Keep customers on supply<br>• Recover money owed (debt)<br>• Lower overhead<br>• No bill production<br>• No bill distribution<br>• No need to chase payments<br>• No further actions such as disconnections<br>• Social acceptability<br>• Customer responsible for disconnection | • Flexible payment solution<br>• Pay to suit your income status<br>• Daily, weekly , monthly budgeting<br>• Show true cost of consumption and money left<br>• Reduce consumption when income is tight–<br>• make money last<br>• Reduce waste – conserve energy<br>• No bills<br>• No billing errors<br>• No socially unacceptable disconnections. |


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### G. Property Tax Database system

All councils and townships permitted by the law to collect property tax must first establish the database of taxpayers. Together with all important information about a particular building or structure, also the TANESCO prepaid meter number installed on that building must be recorded. Depending on the frequency of payment of property tax for each particular council or township (quarterly, semiannually, and annually), the expired date of each payment must be recorded as it will be used by prepaid metering system to compare with the current date (the date a customer request for recharge of electricity).

### H. Comparative Analysis on the current and proposed system of property tax administration

Tab. 5 shows the strengths of the proposed system model compared to the current system used by councils in collecting property tax.

Table 5. Comparative Analysis on the two systems

| Current System | Proposed System |
|---|---|
| Big Overhead in property identification | Small Overhead in property identification as majority of property owners will be registering their properties themselves immediately after starting to enjoy electricity |
| Bill distribution | No bill distribution, customers are notified about their bill due date during energy recharging of their meter. |
| Delayed payment and penalty | The system will force taxpayers to pay on time to avoid problems during electricity recharge for their meter |
| Need strong enforcement strategies | Little enforcement as the system itself will force taxpayers to pay in order to continue enjoying electricity which is a very basic service. |

## RECOMMENDATION AND CONCUSION

For the effective functioning of the proposed system of property tax collection, councils need to have a well packed database of taxpayers. Property identification and valuation are the key inputs to that database. Therefore this paper recommends that councils must put more efforts in identifying and establishing of actual properties value which will help them to set fair rates to the taxpayers. Also since there is high dependence on local leaders in identification of taxable properties and most of them are not salaried employees, councils need to provide them with motivation so that they can work hard and provide good support to council employees.

Property tax compliance in all surveyed councils is to a large extent not voluntary. Very few property owners would be considered to comply voluntarily as for many taxpayers the tendency of delaying payment is a common phenomenon. In this study it has been observed that implementing enforcement instruments is rarely done. While enforcement instruments are stipulated in the legislation and council by-laws, they are hardly put into action. This is probably one of the reasons for many property owners to accumulate tax arrears for a number of years. The implementation of the proposed system model for property tax collection can be a solution for this problem

## ACKNOWLEDGMENT

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**Mr. Justuce M. Gration** is the Assistant Lecturer in the Department of ICT at the Local Government Training Instutute (LGTI) in Tanzania. He attained his Bachelor of Science Degree in Computer Science at the University of Dar-es-Salaam, Tanzania and Master of Science Degree in Telecommunication Engineering at The University of Dodoma , Tanzania. He has published a number of papers addressing application of ICT in revenue collection for local Government Authorities plus attending different conferences about revenue enhancement strategies. He is an experienced lecturer instructing ICT related subjects at his work place.

**Mr. Kennedy Oriko** is the Assistant Lecturer in the Department of Human Resource Management at the Local Government Training Instutute (LGTI) in Tanzania. He attained his Master of Science in Human Resource Management Development at Mzumbe University at Morogoro and Bachelor of Arts with Education at the University of Dar es Salaam, Tanzania.

**Mr. Benedict Anselmi** is the Assistant Lecturer in the Department of Community Development at the Local Government Training Instutute (LGTI) in Tanzania. He attained his Master of Arts in Community Development at Mount Meru University at Arusha and Advanced Diplama in Community Development at Community Developmet Training Institute in Arusha, Tanznia.

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