

# **Urban Management Land Information System UMLIS: Facing Urban Challenges through Efficient Revenue Collection**

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**Key words:** property taxation, local governance, urbanisation

## **SUMMARY**

The local assemblies in Ghana are responsible for providing a clean and healthy environment and public infrastructure for the citizens. Due to financial and technical means the assemblies often fail to fulfil their responsibilities. Property rates constitute a substantial part of the total revenue for local assemblies, but the collection of property rates is often not efficient. This is a common problem not only for Ghana, but for many developing countries.

In 2005-2009 the Urban Management Land Information System (UMLIS) pilot project was carried out by Accra Metropolitan Assembly (AMA) and Ministry of Local Government and Rural Development (MLGRD), in cooperation with Swedesurvey AB and Geo-Tech Systems Ltd.. The objectives of the project were a built-up capacity within AMA and a developed and tested UMLIS in a pilot scale. The overall objective of UMLIS is a more efficient collection of property rates and other fees, and AMA has made UMLIS its main strategy for revenue mobilisation for the coming year (Accra Metropolitan Assembly, 2006).

It has been shown in the project that UMLIS is an efficient tool for collection of property rates and for urban management in general. Information about buildings, parcels, use, value, owners and rates to be paid is stored in digital form and the information can easily be illustrated and identified in a digital map. The possibility of storing data from various sources in a common platform is a starting point for exchange of information and collaboration between departments and different organisations. Inconsistencies in land information have been identified as one of the main reasons for low collection of property rates, and UMLIS can facilitate exchange of information and be a tool for improving its quality.

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## 1. INTRODUCTION

Urbanisation is becoming more and more complex for cities in Ghana and developing countries in general. It is indeed an undeniable fact that the trend of urbanisation cannot be reversed. Urbanisation also brings with it unbudgeted financial commitments towards waste generation which becomes challenging for many cities. It is therefore important that proper urban management measures and strategies are put in place to deal with this complex situation.

In this paper experiences from the Urban Management Land Information System (UMLIS) project in Ghana are presented: reasons for low revenue collection of property rates for local authorities are identified and UMLIS as a tool for efficient collection of property rates is discussed.

## 2. BACKGROUND

### 2.1 Land Administration in Ghana

#### 2.1.1 Land Sector Agencies

Land administration in Ghana is handled by four land sector agencies under the Ministry of Lands and Natural Resources namely: Lands Commission, Administration of Stool Land (AOSL), Town and Country Planning Department (TCPD) and Asantehene's Land Secretariat (which only handles the Ashanti region of Ghana and nearby areas). These agencies hold basic land information such as value, use, rights and plans of parcels.

The Government of Ghana issued its Land Policy in 1999. The long term goal is to stimulate economic development, reduce poverty and promote social stability by improving security of land tenure, simplifying the process for accessing land and making it fair, transparent and efficient, developing the land market and fostering prudent land management. The goal will be achieved through a long-term (15-25 years) land administration programme. The Land Administration Project (LAP), funded by the World Bank, began in 2003 (Ministry of Lands, Forestry and Mines, 2007). One of its goals is to create a more efficient organisation of the land administration institutions. One result of the project is the new Lands Commission which in 2008 replaced four former land sector agencies.

### 2.1.2 Local Authorities

The Local Government Act 1993 (Act 462) provides the institutional and legal framework for local authorities, under Ministry of Local Government and Rural Development (MLGRD). The metropolitan, municipal and district assemblies are responsible for overall development and activities such as public infrastructure - schools, markets, transport etc. Their responsibilities include preparation and approval of layouts, planning, development permits and management.

Property rates, business operating permits, development permits etc. provide revenue to support local authorities in the performance of their functions. Property rates are based on the value of the building and are paid by the owner of the building. Property rates are independent of the value of the land, and should not be confused with the ground rent. In Ghana there is a large potential for revenue from property rates that is not utilised. For instance property rates alone contribute to more than 65 percent of internally generated sources of revenue to the Accra Metropolitan Assembly (AMA). However, in 2008 about 35 percent of the property rate budget was actually collected (Accra Metropolitan Assembly, 2009). This reduces AMA's capacity to develop and to provide services to its citizens and puts constraints on central government funds. It therefore reduces Government's ability to channel funds to meet urgent needs in the rural areas and neglected sectors.

Effective operation of the local authorities depends on land information processed by the land sector agencies. The current land administration processes in Ghana are centralised at national and regional levels and therefore the information generated is difficult for the local authorities to obtain. All land processes manifest at local level within the jurisdiction of the assemblies where actual action (planning, implementation and management) takes place but collaboration between local authorities and the land sector agencies is weak and information that is needed about land is not always available at local level.

## **3. IMPLEMENTATION STRATEGY**

The UMLIS pilot project was carried out 2005-2009 by MLGRD and AMA, with support from Swedesurvey AB and Geo-Tech Systems Ltd. The project was financed by Swedish International Cooperation Development Agency (Sida) and Government of Ghana counterpart funding. AMA has made UMLIS its main strategy for revenue mobilisation for the coming year, and the implementation of the pilot project was in line with the strategy (Accra Metropolitan Assembly, 2006).

UMLIS can serve as a platform for various municipal activities. Almost all municipal processes and activities require land information; interestingly the same processes and activities also generate land related information. UMLIS is a system combining geographic and alphanumeric data. An up-dated digital base map facilitates identification of parcels, buildings, information on owners, values of properties and rates to be paid. Once the platform is set other infrastructural facilities can be registered and demographic attributes and socio-economic statistics can be analysed and presented for a common and coordinated

management of the urban area. In this way all urban development and management endeavours are effectively consolidated for good results.

UMLIS can be implemented step-by-step. Revenue collection as the priority is fundamental since it gives the assemblies economic pre-eminence making it possible to invest in neglected sectors, like waste management, and utility and infrastructural services. One important part of the strategy is capacity building. Institutional competence needs to be built in the organisation, especially in: project management; Geographic Information System (GIS); IT; data capture methods, and; basic system design and development. This will strengthen the local municipal authorities to perform and manage the urban environment effectively, and sustain the system in the future.

In order to implement UMLIS in Ghana in an efficient way the following activities are planned, of which steps 1-2 have been carried out already:

1. Develop UMLIS and test the system in pilot scale in AMA. The priorities are to develop the platform and an application for property rates collection, and increase capacity within the organisation;
2. Use experiences from the pilot project to set up strategies for a full scale implementation of UMLIS in Accra;
3. Implement UMLIS, including an address system, in a full scale in Accra;
4. Develop other UMLIS applications, such as applications for issuing building permits and waste management. Use increased revenue mobilisation for improving infrastructure and services for the citizens, and people in rural areas.
5. Replicate UMLIS to other local authorities in Ghana.

#### **4. METHODOLOGY FOR IMPLEMENTING UMLIS**

Methods used for implementing UMLIS in a pilot scale in Accra are presented below. UMLIS can be an efficient tool for urban management also in other countries, but the methods need to be adapted to the organisation's starting point and future needs.

##### **4.1 Pilot Area**

There are many advantages of starting a project in a pilot scale: less information needs to be captured and the result can be shown in a shorter period of time and; it will also be possible to learn from mistakes and improve methods before a full scale implementation. In the project three of AMA's eleven sub-metro districts were chosen as a pilot area, Ayawaso which corresponds to 36.6 km sq., 30,000 properties and 335,000 inhabitants. The population in Accra at the last census in March 2000 was approximately 1,700,000 inhabitants (Ghana

Statistical Service, 2002). The selected area included all conditions that may occur in Accra, which is a prerequisite for finding clear strategies for a full-scale implementation.

The real life test was, however, carried out in only a small part of the pilot area (150 properties); the reasons for this was shortage of time and a wish to get a better dialog with the property owners.

**4.2 Design and Development**

In the development of UMLIS, the intention was to follow a simplified Rational Unified Process (RUP), which is a system development model for the design and implementation of IT systems (Kruchten, 2002). The RUP follows an iterative approach which means that it is possible to go back and change the system requirements and rearrange the following steps.

The first step was mapping the workflow for the existing land revenue management process within the AMA and a study of the existing IT environment. An analysis of the existing situation was carried out and future system requirements, including use cases for the system, were developed in close collaboration with personnel from AMA. UMLIS was developed in cooperation with private companies in Ghana, which will facilitate maintenance of the system in the future. The system constitutes three main components, see figure 2.

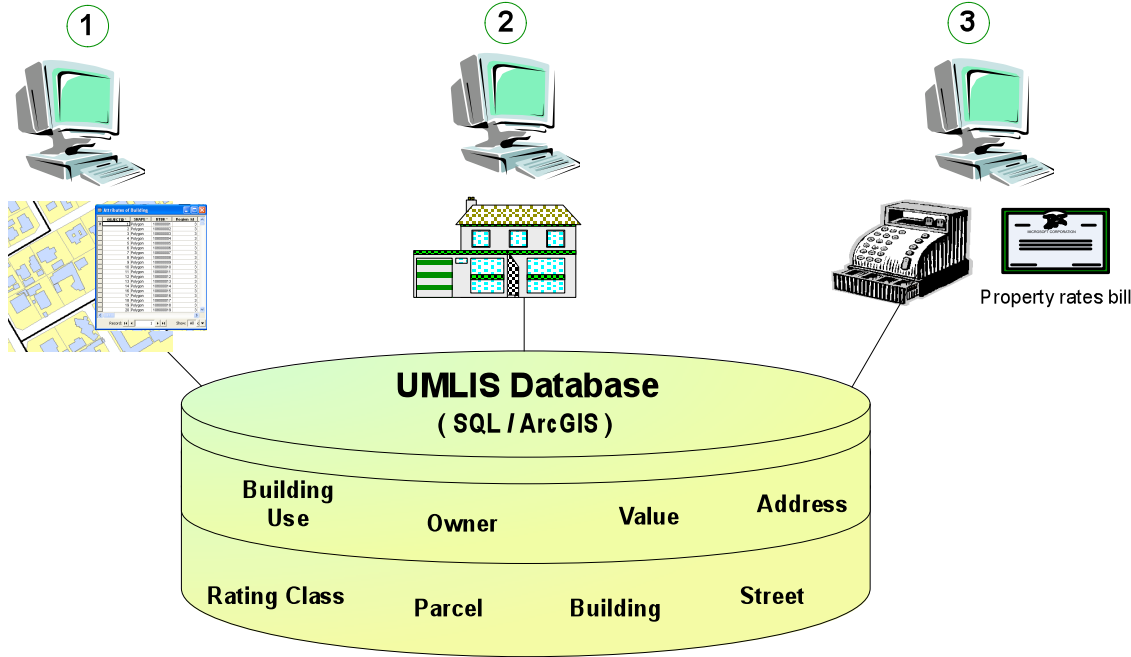


Figure 2. The components of UMLIS: 1) the geographical component, 2) the building component for registration of the building and its owner, and 3) the financial component for invoicing of property rates.

### 4.3 Data Capture

Data collection and verification is a time consuming activity, but in order to increase the revenue collection information of good quality is a prerequisite. The data model and the database structure for UMLIS gave instructions as to what information needs to be captured. Most of the information required was available at the land sector agency, Lands Commission. However, the information had to be converted to be compatible with the UMLIS database format. Quality controls were carried out before the information was imported into the databases. When the information was not available in digital form it had to be captured/digitalised. The building is the main information in UMLIS because property rates are based on the values of buildings. All captured information was linked to the building.

The data capture process is described in figure 2.

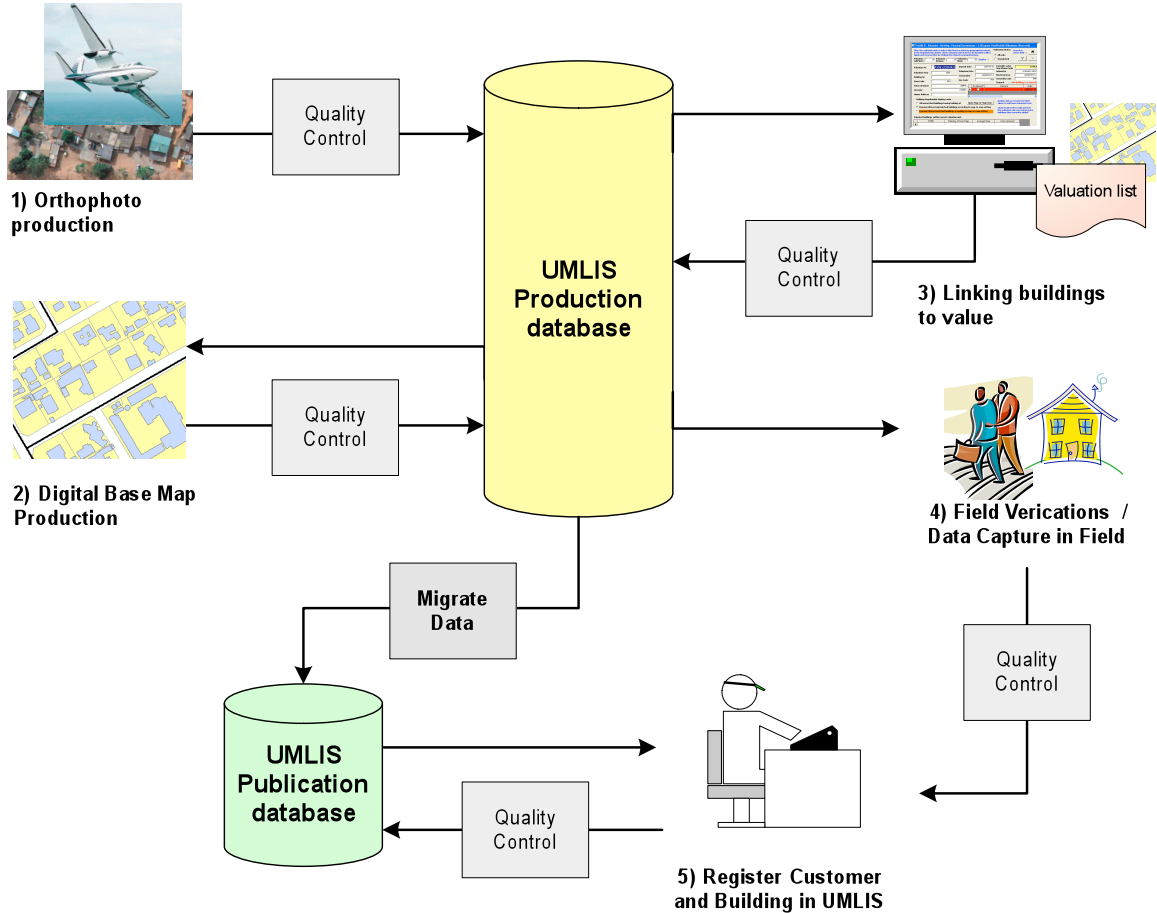


Figure 2. Data collection flow for UMLIS in Accra.

The data capture of UMLIS started with the geographical component and aerial photography was carried out as a first step. The aerial photographs and orthophotos were efficiently used for mapping buildings and other graphical features such as streets and drainage. Later parcel plans and administrative boundaries were added to the digital map.

Information about valuation units, and their use, value and owner were received from Lands Commission. It was an important but extensive work linking buildings in the digital map with the valuation units, which only were represented on hard copy maps. An Access tool was developed for this purpose. The last step in the data capture process was verification in the field. Complementary data capture about owners was necessary because many inconsistencies in the information from Lands Commission were found. Questionnaires were used for data collection of property owners. The data capture process was described in a manual, which will be useful in the full scale implementation.

#### **4.4 Test in Real Life Situation**

Public awareness campaigns were carried out before the real life test started. The objectives of the public awareness were to sensitise the selected property owners and address their concerns. The test in real life situation included implementation and test of developed manuals and computerised applications, and of the organisation set up to run the system. Capacity building was an integral part during the entire project and was included at all stages in the project. The test was a good opportunity to verify the competence within the organisation.

The UMLIS application was used for registering buildings and owners. The information already collected in digital form was retrieved by the system and the information collected in the field using questionnaires was entered in UMLIS. Bills for property rates were created and printed for the test area by the system. The bill included information about the owner and her/his address, the valuation unit number, the unique building key, the value of the property and rates to be paid. Payments were later registered in the system.

### **5. EXPERIENCES**

When UMLIS was developed and tested in a pilot scale several reasons for the low collection of property rates were identified and in this chapter UMLIS as a tool for efficient collection of property rates is evaluated based on experiences from the project.

#### **5.1 Defects in ownership information**

It was found that ownership information from Land Commission generally is inadequate; it lacks, for example personal identification numbers (e.g. SSNIT number), full names and complete addresses. In some cases it was found that the registered property owner was deceased and that a new owner had not been reported. AMA has experienced that property owners often refuse to pay their bills if the ownership information is incorrect, e.g. the name is misspelled.

UMLIS, developed in the pilot project requires full names of an owners, its date of birth, and – if it exists for that person– a unique identification number. Control functions prevents a user to be registered a second time if that person already exists in the system. This solves the problems with identifying owners. The system also supports storing of former owners and other stakeholders to the property, i.e. caretaker. These storing procedures are useful when an owner is deceased and other responsible payers need to be identified.

In the future AMA plan to add an address system to UMLIS and thereafter the owner can be linked to a proper address. Up-to-date and reliable addresses in the system facilitate delivery of bills to the customers.

## **5.2 Not all Rateable Buildings are Valued**

The work of linking values to buildings has revealed the fact that some buildings (about 30 %) in the digital base map for the pilot area Ayawaso are without a value. The reasons can be: oversight by the land sector agency, a new building has been constructed after the valuation was carried out, or the structure is not rateable, e.g. a kiosk. In many cases, however, the building should have had a value and this mistake reduces the revenue from property rates. It was also identified that some property owners were paying property rates for properties other than their own. This situation puts a real burden on others, while some enjoy no rents.

In UMLIS information from different sources can be linked and viewed in the same map. It was therefore possible to detect inconsistencies in valuation data. The land sector agency can be notified about the problem, and requested to value the remaining buildings. When the valuation of all buildings in Accra is carried out next time, the land sector agency should be provided by up-dated digital maps from UMLIS. In this way all rateable buildings can be valued and the corresponding property rates can be paid by the responsible persons.

## **5.3 Unauthorised Buildings**

When information from different sources was brought together inconsistencies were detected. It was found that numerous buildings (about 18 %) have been constructed without being within the boundaries of a parcel, see example in figure 3. This may be because the parcel had not been surveyed or the owner of the building failed to apply for building permission.

A general problem in Ghana and many other countries are cumbersome and expensive procedures for land title and building permit application, which leads to informal settlements. By having updated maps in UMLIS it is possible to locate unauthorized structures. This will probably increase collection of permit fees and property rates. Aerial photography can be carried out e.g. every fifth year in order to keep the maps up to date. Another method is to continuously carry out field verifications and in that way observe unauthorised structures. It is also important that the land information is exchanged and shared between the land sector agency and the local authorities, and UMLIS is a good platform for that.



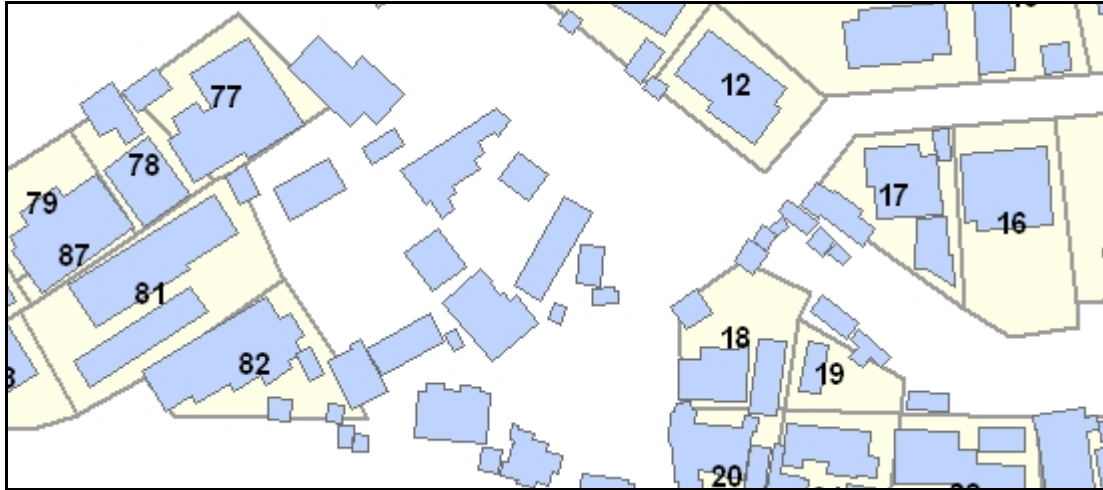


Figure 3. Example of a building constructed without being within the boundaries of a parcel.

#### 5.4 Manual Procedures and Few Controls

Manual procedures are common in the urban administration at AMA, and the computerised systems that are in use are often not linked. For example, the property payments that are carried out at sub-metro offices are manually recorded, and later transferred and registered in the billing and payment system at the head office. There are furthermore no links between the billing and payment system, and the accounting system. It is difficult to track a payment and also the person who received it; this gives rise to easy misappropriation of funds.

The controls functions in UMLIS lead to efficient land information management with accurate, easily accessible and up-to date land information which will lead to a more efficient revenue collection and a reduction in corruption. It is also possible for the sub-metro offices and the head office to use the same system, and data can be shared through the Internet.

#### 5.5 Poor Feedback to Citizens

Citizens in Ghana receive poor information about how the AMA uses revenue from property rates for improving the infrastructure in the city, and this makes them unmotivated to pay their bills.

The property rate owners that participated in the real life test of UMLIS were in general pleased with the new billing system and its geographic component and how the system will benefit them in terms of knowing how much their community / block is paying in contrast to the services they can require from AMA. Individuals can also track property rate transactions and real estate information more easily. The result of the pilot test was successful: the percentage of property rates collection in the test area will be higher than earlier years, but the final result will not be ready until the end of February.

## 6. LESSONS LEARNED

The following lessons have been learned in the project:

- System development needs to be carried out in close cooperation with the client, in this case AMA, in order to fulfil the client's need.
- Data capture is an extensive work which requires time and human resources. The information in the system needs to be of good quality in order to increase the revenues from property rates.
- Cooperation between the land sector agencies and the local authority is a prerequisite for the success of UMLIS, and it is important to continuously inform stakeholders about the progress of the project.
- In order to establish a complete secure system and to find the correct owners, ID numbers for all inhabitants would have been needed. If there were ownership certificate available it would also have been useful.
- The application procedure for building permission needs to be simplified.

## 7. CONCLUSION

It has been shown that UMLIS is a good tool for revenue collection. UMLIS enhances effective land information management with accurate, easily accessible and up-to-date land information which leads to a more effective revenue collection. The system is transparent and the control functions prevent corruption which in turn increases revenue for local authorities. In addition, financial reports and illustrated maps from the system can identify areas where the revenue collection is low and where action needs to be taken.

The possibility of storing data from various sources is a starting point for a closer working collaboration between land sector agencies and local authorities. An efficient exchange of information between various stakeholders in the Assembly keeps the information in the registers up-dated and reliable.

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