

Improvement of Availability of Land Registration and Cadastral Information in Ondo State, Nigeria

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by

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To
Yemisi;
and
Dayo, Suen & Dami

Abstract

Recent experience and studies have shown that most industrialised nations have derived a reasonable proportion of their economic achievements from active land markets that are supported by formalised and improved land registration and cadastral systems. In such countries, land registration and cadastral information are available to support the land market, planning processes, taxation and mortgages, and capital are easily raised because there is an instantaneous access to property records and one can confirm who owns what at any point in time. The situation differs grossly in most less developed countries, with accompanying social and economic consequences. While it may not be very obvious to all observers that enhancement of land registration system will bring economic improvements in a society, it is apparent that the delivery of land and property related services in Nigeria are at a point requiring urgent attention.

There is need for land management organisations to make a radical review of the current situation and customers' requirements, redesign processes for optimal performance and take the full advantage of Geo-ICT to deliver improved services and products. This places a call for business orientation when dealing with land matters. The solution is an integrated applied research in land information management, as presented in this thesis. This viewpoint is accentuated by the focus of the government on economic liberalisation, competition and privatisation to involve the private sector in the delivery of public services to get the job done, when government of Nigeria cannot do it alone and reduce the dominance of unproductive investments in the provision of services. A major goal here is to meet the desires or aspirations of the citizens.

Set against these considerations, this thesis looks at the challenge of making land and property related information available when needed from a geo-information management perspective. Relevant policies in Nigeria were reviewed and a theoretical framework was provided for the study. The South African success in LIService provision was cited as an example of a good practice in Africa. Organisational issues and changing institutional arrangements, partnership and cooperation with the private sector in land information provision were discussed. Facts or data were gathered from the study area to give a clear understanding of the present situation. The current circumstances were modelled and analysed, and the desired future was determined from users' requirements and use of the appropriate technology. Strategies and actions were provided to bridge the gap between the current situation and the desired future. A system referred to as Land Registration and Cadastral Infrastructure (LRCI) was developed from tested models and validated architecture. A Unified Service Centre (USC) was proposed as the 'doorway' of the infrastructure to provide one-stop solution, which is the main objective of this research. Five harmonising funding solutions were proposed for the LRCI. Guidelines and conditions for implementation of the proposed infrastructure were presented with issues for further studies.

It is noted in the thesis that users' knowledge and understanding of available technology plays important role in the expression of their desires for land information products and services. As users' knowledge of available technology increases, land information service providers will be faced with the challenge of expanding their services. Thus, land administration systems should be built on an adaptable and scalable architecture. To improve LIService delivery in the study area, institutional and organisational changes that will strengthen relationships and accountability between policy makers, LIService provider and customers were recommended.

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List of acronyms

BIR	Board of Internal Revenue, Akure, Ondo State, Nigeria
BPE	Bureau of Public Enterprises, The Presidency, Abuja, Nigeria
BPR	Business Process Re-engineering
C. of O.	Certificate of Occupancy
CCPPP	Canadian Council for Public-Private Partnerships
CPI	Continuous Performance Improvement
e-LIServices	Electronic Land Information Services
ESRI	Environmental Systems Research Institute, Redlands, California, USA
FGN	Federal Government of Nigeria
GDI	Geospatial Data Infrastructure
Geo-ICT	Geo-Information and Communication Technology
GFM	Geoinformatics
GI	Geo-Information
GIM	Geo-Information Management
GPS	Global Positioning System
GSDI	Global Spatial Data Infrastructure
ICPC	Independent Corrupt Practices and Other Related Offences Commission, Nigeria
ICT	Information and Communication Technology
IT	Information Technology
LARCIN	Land Registration and Cadastral Information
LDC	Less Developed Country
LDCs	Less Developed Countries
LI	Land Information
LIS	Land Information System
LIService	Land Information Service
LRCI	Land Registration and Cadastral Infrastructure
LRCS	Land Registration and Cadastral Systems
LUA	Land Use Act Cap 202 Laws of the Federation (Nigeria)
LUD	Land Use Decree, 1978 (Nigeria)
MWLH	Ministry of Works, Lands and Housing, Akure, Ondo State, Nigeria
NAGIS	National Geographic Information System
NALRECS	National Land Registration and Cadastral System
NASRDA	National Space Research and Development Agency
NGDI	National Geospatial Data Infrastructure
NGII	National Geographic Information Infrastructure
NGP	National Geoinformation Policy
NLIS	National Land Information System
NPC	National Planning Commission
NPIT	National Policy for Information Technology
NSP	National Space Policy
ODSHC	Ondo State Housing Corporation, Akure, Ondo State, Nigeria
OSDPC	Ondo State Development and Property Corporation
PFI	Private Finance Initiative
PPP	Public Private Partnerships

PRV	Privatisation
RECTAS	Regional Centre for Training in Aerospace Surveys
RSA	Republic of South Africa
SG	Surveyor General
SGO	Surveyor's General Office
SWOT	Strengths, Weaknesses, Opportunities & Threats
TI	Transparency International
UK	United Kingdom
USA	United States of America

1. Land information management in Nigeria

1.1. Background

An effective and efficient land information management ensures that all data related to land are consistent, correct and up-to-date and also available to users for different kinds of application without the need to generate new datasets for such purposes. This entails the availability of land information to government, industry, business, academia, and citizens to meet their needs and preferences through easy and simple access solutions. The availability of consistent and integrated land information on a national coverage is often a problem in many countries and the situation in Nigeria is not different. The problem in Nigeria is that the information is not available in most cases or available in a state that limits its use. This dilemma is further accentuated by the fact that land information providers and users do not know which data or information is available in the country. The general situation of the Geo-Information (GI) industry in Nigeria is chaotic: maps are obsolete (over 40 years old!), most of the information that are available are in analogue form, at the same time money and efforts are being wasted by the private sector (especially oil companies) and the government in duplicative generation of new digital data sets, especially in the oil rich Niger Delta. There are no national acceptable data standards, ‘everybody is on her own, using her own standard’. On the other hand, citizens, private organisations and government agencies in Nigeria are demanding greater and faster access to reliable and up-to-date land information for their daily activities and business ventures. The major challenge is the creation of current and authentic land information to meet the diversified needs of the users. When the information is available, the next step which cannot be separated from availability is accessibility to the information. There are many organisations involved in the processes of collection, storage and maintenance of cadastral and land registration information in Nigeria, these government agencies collect the relevant data and store them in a way that makes their retrieval cumbersome and in many cases impossible. The cadastral maps and associated legal documents are usually damaged within a short period of time because of poor storage. In consequence, required cadastral and land information though collected may be described as not available in many parts of Nigeria.

There is no partnership and institutional arrangements between private and public organisations to reduce duplication of efforts and cost of collection of land and property-related information. This is attainable within the context of Geospatial Data Infrastructure (GDI). GDI consists of “*networked geospatial databases and data handling facilities, the complex of institutional, organisational, technological, human, and economic resources which interact with one another and underpin the design, implementation, and maintenance of mechanisms facilitating the sharing, access to, and responsible use of geospatial data at an affordable cost for a specific application domain or enterprise*” (Groot and McLaughlin, 2000). A step further would be for organisations to go beyond their individual capabilities to link data and services together to offer better services. According to (Radwan, 2004b), the key concept here is for GI service providers to develop partnership of geo-information organisations to provide wider scope of services, of size and complexity that is beyond their individual capacity, making use of opportunities offered by ICT.

responsibility in Nigeria and thus, government information, creation of an easy access is of course necessary, but completely free access to LARCIN may not be a realistic objective. In my own considered opinion, the NPIT gives reasonable attention to the important issues of standards and interoperability by noting among others the need for compatibility in sharing data and information. The establishment of state information infrastructure has been identified as a strategy of achieving the goals of the NPIT; such infrastructure should take into cognisance the role of LRCI in sustainable development and good governance.

1.1.3. Nigerian national space policy

The National Space Policy (NSP) of Nigeria focussed on the use of space capabilities as an essential tool for socio-economic development and improvement of the quality of life of its people. One of the potential areas of benefits identified in the policy is resources assessment and management, with attention to land use planning. The policy objectives are to be achieved through research, education, engineering, design, development and manufacture of appropriate hardware and software in space technology. Among the hardware and software listed in the programme are transport and payloads such as satellites and telescopes antennas for scientific research as well as other space applications (FGN, 2001a). Through the execution of the policy programmes and activities, Nigeria hopes to achieve food security by developing and managing agriculture and forestry resources through the establishment of database(s) for project planning, crop performance assessment, and food yield. A prominent outcome of the NSP is the launching of NigeriaSat-1 on 27 September 2003, a low earth orbital micro-satellite weighing 100kg. The satellite has a spatial resolution of 32m and is designed to take images in a ground area of 600 x 570 km. NigeriaSat-1 is useful for a wide range of vital humanitarian activities, including disaster management and early warning signals for floods, etc. Information obtained would assist government to document, plan, evacuate victims, and manage disasters (FGN, 2004). A comparison of NigeriaSat-1 with other satellites is presented in table 1.1 (Sholiyi, 2003).

Satellite (Instrument)	Landsat 4+ (TM)	Spot (HRV)	UoSAT-12 (MSC)	NigeriaSat-1 (DMC Imager)	DMC – 5 s/c (DMC Imager)
Swath	185km	60km	55km	600km	600 km
Typical Revisit	16 days	26 days	7days	3 - 5 days	1 day
Spatial Resolution	30m	20m	32m	32m	32 m
Pixels	6000	3000	1680	19000	19000

Table 1-1 Comparison of NigeriaSat-1 with other Satellites

The satellite will also to be useful in the determination of human activities on the environment, identification of areas vulnerable to natural hazards and direction of spread of damages. This would enable government to install appropriate plans to avoid or manage occurrence of disasters such as oil pollution, desertification, erosion, forest fire, and deforestation. Validation exercises had been carried out in various application areas including three by RECTAS (Fire scar mapping, land use/cover mapping and local government/urban mapping). A stakeholders' workshop on the validation took place in June 2004 and it was very successful with different results indicating that the image is good enough for 1:100,000 image mapping and 1:300,000 line mapping (Kufoniya, 2004b).

1.2. Problem description

The government of the Federal Republic of Nigeria promulgated on 29th March 1978 a Land Use Decree that vested all land within the territory of each state in the Governor of the state. According to the decree, “*such land shall be held in trust and administered for the use and common benefit of all Nigerians in accordance with the provisions of the Decree*” (FGN, 1978). The Land Use Decree (LUD or simply the Decree) adopted a uniform or homogeneous land tenure system for the country and abolished private land ownership. The Decree now entrenched in the country’s constitution as Land Use Act (LUA) Cap 202 Laws of Nigeria empowered the Governor of each state to grant statutory rights of occupancy “*in respect of land, whether or not in an urban area*” and to “*issue a certificate in evidence of such right of occupancy*”. A certificate issued as an evidence of the right of occupancy is termed a Certificate of Occupancy, commonly referred to as C. of O. The nation-wide homogeneous system of land tenure places highest interest in land in a right of occupancy.

Land occupiers (and potential occupiers) or their agents (Land Surveyors, Lawyers, Town Planners, etc.) have to go to different offices (Land Registry, Area Survey Office, Office of the Surveyor General, Internal Revenue Department, Court, etc.) to process C. of O. and to obtain C. of O. related information. Several society sectors that need land information (e.g. the agents as mentioned, Utility Companies, Banks, Insurance Companies, Telecom Companies, Tax Office, etc) are often frustrated and unhappy. It is either the requested information is not available or could not be found. In fact most utility companies and tax offices collect directly from the field the data required for their operations, because their needs could not be met by responsible government agencies.

The use of land in the most effective way is a fundamental issue requiring urgent attention in Nigeria. There are severe difficulties in getting required land and property-related information, thus yielding little or no economic and social benefits for the government and citizens. Land and property-related information are collected, stored and distributed by government agencies in Nigeria. These organisations are ‘unconnected’ or ‘isolated’ without serious concern for collaboration. Under the present situation, land cannot be properly administered for use and common benefit of all Nigerians.

1.3. Theoretical framework and previous studies

Land is obviously the most valuable of all the resources and other resources are directly or indirectly dependent on it. The need for sustainable use of land has been realised a long time ago, considerably longer than we thought or recognised. This is clearly evident in an African proverb that says: “*Land is not a gift we receive from our parents, but a debt we owe to our children*”. This implies that land should be carefully used to meet our present needs for food, shelter, clothing, recreation, etc without compromising the ability of future generation (our children) to meet their own needs. This is one of the principles (“*the right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations*”) proclaimed at the United Nations Conference on Environment and Development held at Rio de Janeiro from 3 to 14 June 1992 (UN, 1992). Sustainable use of land is only attainable under two conditions:

- availability of reliable and up-to-date land information and
- ease of access to the information by all citizens and different sectors of the society.

LIS has been developed to support decision-making; it is basically a combination of human and technical resources for collection, storage, updating, retrieval, distribution and use of land-related

information. An important aspect of this research is designing, development and organising procedures for archiving, dissemination and effective use of land and property-related information. While improving availability is the core issue of the research, reasonable attention would be given to ease of access of the available information. It is important to distinguish between LIS and LRCS. The term LIS is related to a wide range of spatial information, including environmental and socio-economic data as well as data related to infrastructure systems and cadastre. In this regards, LIS is not necessarily land parcel-based, but may incorporate a variety of types of data (UNECE, 1996). LRCS may be seen as two but closely related and integrated functions, namely: registration and cadastral. Land registration information includes information about rights and restrictions in land, either in form of registration of deeds or registration of title to land. Cadastral information is concerned with land parcels. It consists of maps, plans or sketches showing the size and location of land parcels with text record. UNECE (1996) identified the following as part of the data that may be included in a cadastral system: “*geometric data (coordinates, maps); property addresses; land use; real property information; nature and duration of the tenure; details about the construction of buildings and apartments; population; land taxation values*”. In practice, land registration and cadastral systems or services should operate together under one agency or service provider. According to Kaufmann and Steudler, 1998, “*Land registration and cadastre usually complement each other, they operate as interactive systems. Land registration puts in principle the accent on the relation subject-right, whereas cadastre puts the accent on the relation right-object. In other words: the land registration answers the questions as to who and how, the cadastre answers the questions as to where, how much*”.

The concept of ‘Cadastre 2014’ brings all together. It is a vision for a future cadastral system by the International Federation of Surveyors (FIG) that supposed ‘Cadastre 2014’ would be “*a complete documentation of public and private rights and restrictions for land owners and users. It will be embedded in a broader land information system, fully co-ordinated and automated, without separation of land registration and cadastral mapping*” (Kaufmann and Steudler, 1998). Kaufmann and Steudler (1998) referred to Professor Jo Henssen’s definition of cadastre and gave a broader view of cadastre to include legal situation: public and traditional laws. They define Cadastre 2014 as “*a methodically arranged public inventory of data concerning all legal land objects in a certain country or district, based on a survey of their boundaries. Such legal land objects are systematically identified by means of some separate designation. They are defined either by private or public law. The outlines of the property, the identifier together with descriptive data, may show for each separate land object the nature, size, value and legal rights or restrictions associated with the land object. In addition to this descriptive information defining the land objects, Cadastre 2014 contains official records of rights on the legal land objects. Cadastre 2014 can give answers to the questions of where and how much and who and how*”. In essence, as a comprehensive land recording system, Cadastre 2014 could improve availability of LARCIN, thus a good concept for this research. ‘Where’ in the definition refers to location, ‘how much’ will mean size, ‘who’ is the owner and ‘how’ is the way right to the land is held. Cadastre 2014 suggests that by 2014 there will be no separation between maps and registers, ‘paper and pencil cadastre’ will no longer be in existence and there will be high private sector participation in the delivery of cadastral services, with 100% cost recovery.

A close review of the Cadastre 2014 document reveals that the idea is primarily developed for technologically developed countries and it does not give sufficient attention to the problem of availability of cadastral information which is a major concern in Less Developed Countries (LDCs), especially those in the Sub-Saharan Africa. A Less Developed Country (LDC) solution should focus

While topographic information should be a complete coverage of a country, cadastral or parcel-based information may not be a complete national coverage. The summation of cadastral parcels does not have to equal to the total topographic coverage of a country (Meijere, 2004). However, in a country like The Netherlands with complete national cadastral coverage, all objects including roads, water bodies, etc. are registered and parcel-based, the summation of cadastral parcels may be equal to total topographic coverage, i.e. $\sum Cp = \sum Tp$ (where Cp is cadastral parcels and Tp is the topographic coverage). This type of arrangement may not be realistic in Nigeria. The situation is more likely to be the reverse that is $\sum Cp \neq \sum Tp$ or a 'complete' national coverage of the topography and different levels and approaches to cadastral coverage in different parts of the country. But, this has to be standardised. The national mapping agency of Nigeria is in the process of converting the set of 1,303 topographic maps (scale 1: 50,000) covering Nigeria from analogue to digital. The maps though are obsolete and needs revision may serve as the starting point for using a complete national topographic coverage as a base for other spatially related information systems. This idea is represented in figure 1.3.

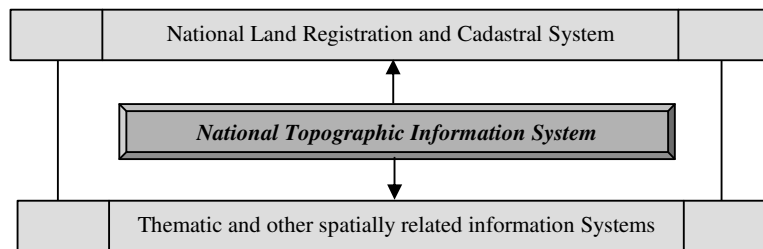


Figure 1-3 Topographic information as a base for other spatially related

Cadastral data is classified as a framework data, it is part of the fundamental datasets for NGDI of Nigeria as specified in the NGP of Nigeria (FMST, 2003). But, a cadastral map or plan produced from boundary (or perimeter) survey may not be absolutely necessary. The interest of land owners or occupiers may simply be in rights and restrictions relating to a land, that is the legal documents, of which a simple diagram, sketch or description may suffice.

Cadastral information may be related to other spatial data and information by assigning coordinates to the cadastral parcels, registering the cadastral map to a base mapping system and relating the parcel identifier to other indexes, such as street addresses and citizen's identification number. NALRECS could be an infrastructure that would provide facilities for users to get access to land and property-related information at affordable costs and at the same time acting as a window to other spatially related information. To achieve these goals, there is a strong need for necessary institutional and organisational frameworks to support NALRECS within the context of a NGDI. GDI enables users to save resources, time and effort when trying to acquire new datasets by avoiding duplication of expenses associated with the generation and maintenance of data and their integration with other datasets (Crompvoets, 2000). The primary focus of SDI is to promote use, integration, interdisciplinary analysis and application of geospatial data and information at affordable cost, this may be summarized as 'collect once and use many times'. This will allow organisations to concentrate on their core activities and build capacities beyond their individual organisations (Radwan, 2004b). In a general sense, important goals of GDI are to: coordinate GI users and stakeholders, create awareness through public enlightenment, identify users' needs and develop solutions for discovery, access and use of geospatial data, improve access to GI and services, encourage and support service chaining, develop standards, facilitate data acquisition, sharing and use, form a network of organisations and build relationships to sustain the GDI.

At the fifth annual meeting for the Global Spatial Data Infrastructure (GSDI) held in Cartagena, Columbia in May 2001, the Columbian Minister of Environment, Mr Juan Mayr affirmed at the opening session that “...*the Colombian Spatial Data Infrastructure is considered in our country as a key initiative for policy formulation and guideline establishment to organise data production, avoid redundancy and facilitate its use and analysis*”. He emphasised how important he had found geospatial information for decision making throughout his life, even down to use of the map in his pocket while hiking (GSDI, 2001). Human problems and needs are spatially related, requiring geo-information GI, when GI is not available, out-of-date or not easily accessible in any society, the result is less development. Land and property-related information are GI that stimulates social and economic activities; hence ease of access and use of such information can reduce poverty and create wealth in societies. Participation, transparency, rule of law, consensus, equity and inclusiveness, accountability, etc are essential ingredients of good governance that are difficult, if not impossible to realise without availability and accessibility to GI. The government of Nigeria has conceived, planned and executed many development programmes without appropriate GI, for instance in the case of the iron and steel complex, the basic information on quality, characteristics and quantity of available raw materials was not available (Asiodu, 1975). The fundamental flaw in the Kainji Lake project was the lack of understanding of the hydrological cycle of West Africa and the failure to take this critical information into consideration at the design stage (Abiodun, 1999). This project failed because the essential ingredient (GI) was missing. The Federal Government of Nigeria spent billions of Naira on other projects such as Directorate of Foods Roads and Rural Infrastructure (DFRRI), Mass Mobilisation for Social and Economic Recovery (MAMSER) and National Directorate of Employment (NDE), etc. without achieving any positive result. Any project planned and implemented without appropriate and up-to-date GI will not be successful; it may be likened to a house built with faulty or poor foundation. The house will collapse and will never stand the test of time. Accessibility to land and property-related information is crucial to the planning and implementation of programmes related to food and shelter.

The success of The Netherlands Cadastre is largely related to the organisation’s sufficient attention to availability of land information by the users. The Dutch Kadaster is of the opinion that their “*clients must at all times have every confidence that the relevant information is correct, available and accessible*” and the organisation is constantly striving to improve the services they offer to their clients (Kadaster, 2000). This implies that the Dutch Kadaster knows its users and their requirements, and makes continuous efforts to perform better than the expectation of the users. A business process has been defined as any function within an organisation that enables the organisation to successfully deliver its products and services. It is “*a set of logically related activities carried out by a system providing an output which satisfies a customer’s needs*” (Akpooyoware, 2003). Akpooyoware recommended the following and other organisational measures to achieve desired improvements: the development of a business and action plan, development of new organisational structures, introduction of quality management systems for continuous improvement, and enhancement of relationship with users. A supplementary action on Akpooyoware’s “*improving Cadastral Services from Federal Ministry of Works and Housing, Nigeria*” will be to find out internal and external factors or pressures which may hinder the availability of cadastral information and may not allow users to have the required level of accessibility to available land information in Nigeria.

Although users may not be clear about what they need, their requirements must be clear to the service providing organisation and the organisation must mobilise its resources to meet the needs of the users. UNECE (1996) noted that introducing a new land administration system is a huge and time-consuming process, requiring solid investigation. It emphasised the importance of an improved organisational structure and noted that legislation, organisation and funding are frequently more complex to solve than technical issues. Improving availability to land registration and cadastral information means realigning the people (personnel, organisation, expertise and lifestyle), modification of processes (rules, regulations and procedures) and technological shift (e.g. automation, from hard to soft copies). Organisational structures, policies and processes have to change and this is more realistic within the framework of a redesign of business processes with a view to achieve improvements in performance, this is commonly referred to as Business Process Reengineering (BPR). Erlendsson (2001) viewed government BPR as “*a radical improvement approach that critically examines, rethinks and redesigns mission product and service processes within a political environment. It achieves dramatic mission performance gains from multiple customer and stakeholder perspectives. It is a key part of a process management approach for optimal performance that continually evaluates, adjusts or removes processes*”. Reeve and Petch (1999) suggested that “*to take the fullest advantages of new Information Systems, the BPR philosophy argues that radically different office procedures need to be introduced. Workflows need to be redesigned to accommodate the new system, rather than the new system designed to accommodate existing procedures*”. We may take a closer look at BPR from the two views advanced by Hammer and Champy (1993) as presented by (Reeve and Petch, 1999). These views are:

- “Reengineering is the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical contemporary measures of performance, such as cost, quality, service and speed.” and
- “Business reengineering isn’t about fixing anything. Business reengineering means starting all over, starting from the scratch.”

The fundamental step of the New Zealand Landonline programme was the use of best practice systems analysis methodology and tools applied by business consultants Price Waterhouse (Grant, 2004). This emphasises the need for business orientation and management issues when dealing with land matters. In recognition of managerial and organisational issues in land administration, the government of Poland created an Inter-ministerial Committee for preparing Governmental Programme for Development of Cadastral System and accepted assistance of the World Bank to support institutional development (Sambura, 2004). Sambura observed that the introduction of a modern information technology system into the existing inefficient organisation of land administration in a country is going to bring only marginal efficiency and probably is not worth the investment of huge amount of funds. This assertion is very important in the case of Nigeria and indeed for many countries with inefficient public service, poor governance and other societal conundrums.

The last point in this section but perhaps the foremost for the state is taxation and land market. Apart from being a fiscal instrument for land administration, taxes on land and property is a revenue generation solution for the government. Two basic forms of land and property taxes were identified by Dale and McLaughlin (1999) as annual levy based on an assessment of the value of the land or property and levy on transfer of land and property. According to Dale and McLaughlin, the yearly levy may be based on the estimated market value for which the property would sell or the assessed rental value of the land or property, while land transfer levy (stamp duty) is normally based on a scale

of fees that relates to the value of the property being transferred. Governments are well known for using taxes to intervene in the land market. High taxes may encourage informal markets, thus reduce the earnings of the government from the land market. Fiscal cadastre is also an instrument used by government for administering land policies. It is however worthy of note that the argument that complete cadastral coverage of a country will improve government revenue through property tax and bring tenure security for land occupiers may not be true in all cases. This has not been clearly proven empirically and the fact that taxation is a form of transfer of income queries the justification of its use on properties, especially when it does not generate any income for the owner.

1.4. Research objective

The primary objective of this research is to develop a prototype for a single-window access for ease of use of land and property-related information in Ondo State of Nigeria. The research will also determine the level of complexity that the system should address or the degree of single-window solution that is achievable.

1.5. Research questions

1. To which extent are relevant organisations (geo-information providers) involved in the provision of land and property-related information in Ondo State, Nigeria? Which information do they produce and how?
2. Which organisations (private and public) and individuals use land information in Ondo State? What are their requirements? Which groups exist and which land and property-related information do they need?
3. How does the user want to receive land information? What are the requirements to store, retrieve, distribute or disseminate land and property-related information to meet the needs of users?
4. How do we design an extensible and pioneering infrastructure based on provisions of the Land Use Decree?
5. Can step up in government revenue through a single point of contact improve the funding and performance with respect to availability of land registration and cadastral information?
6. Which steps are to be taken to facilitate availability to land information for extensive applications? What are the conditions for implementation?

1.6. Research line of action (steps)

1. Study and review of literature on land information management (what do the experts [e.g. Molen, Groot, Dale, McLaughlin, Williamson, etc.] say about the research topic?). Identification and review example(s) of 'best' or 'good' practices in Africa. Review of previous ITC thesis and dissertations that are relevant for the research. Study of relevant articles and papers from GIM International Magazine, Journal of the Urban and Regional Information Systems Association (URISA), Computer Environment and Urban Systems, etc.
2. Preliminary analyses of core and other producers, users and requirements. Design of a 'global' solution model to be validated on the field.

3. Identification of core and other producers of land information in Ondo State and the type of information produced by each organisation and how it is produced and disseminated. Analysis of existing procedure of recording land and property-related data by producer(s), types of data recorded and how they are recorded.
4. Identification of users of land information in Ondo State. Classification of users into groups and determination of the specific requirements of each group for land and property-related information.
5. Investigation of how information is presently being used by the users, information flow from producer(s) to producer(s), from producer(s) to user(s) and user(s) to producer(s). Translation of requirements into processes to support improved distribution, sharing and accessibility.
6. Analysis of the cost of products and services, and willingness to pay buy users.
7. Review of process improvement theories and process engineering methodologies.
8. Design and prototyping of a single-window LRCI (based on situation analysis and users requirements) to support the availability of land information to private sector organisations and government agency at all levels with enhanced accessibility.
9. Recommendations on how land and property-related taxes could improve Internally Generated Revenue (IGR) in Ondo State within the context of the LRCI.
10. Formulation of conditions for implementation (legislation and managerial practices) of the LRCI in Ondo State.

1.7. Research methods

The methodology proposed for the research is to use various complementary techniques or methods to answer six pertinent questions that will guide the research to attain the stated objectives. As presented in table 1.2, two or more methods will be used to answer each of the research questions in section 1.5. The methods are grouped and related to each other in figure 1.4. The research questions to be addressed in each chapter are shown in table 1.3.

		Research methods									
		Literature Review	Surveys, Questionnaires, Interviews & Workshop (testing of model)	Users' Requirements & Situation Analyses	SWOT Analysis	Processes Identification, Analysis & Building	Financial Analysis	Analysis of Land & related taxes	Design & Prototyping of a single-window Land Registration and Cadastral Infrastructure (LRCI)	Implementation Guidelines	Conditions for Implementation
Research questions											
1	✓	✓									
2	✓	✓	✓								
3	✓	✓	✓						✓		
4	✓	✓	✓		✓	✓					
5	✓	✓	✓					✓			
6	✓			✓					✓	✓	✓

Table 1-2 Research objectives and suggested methods

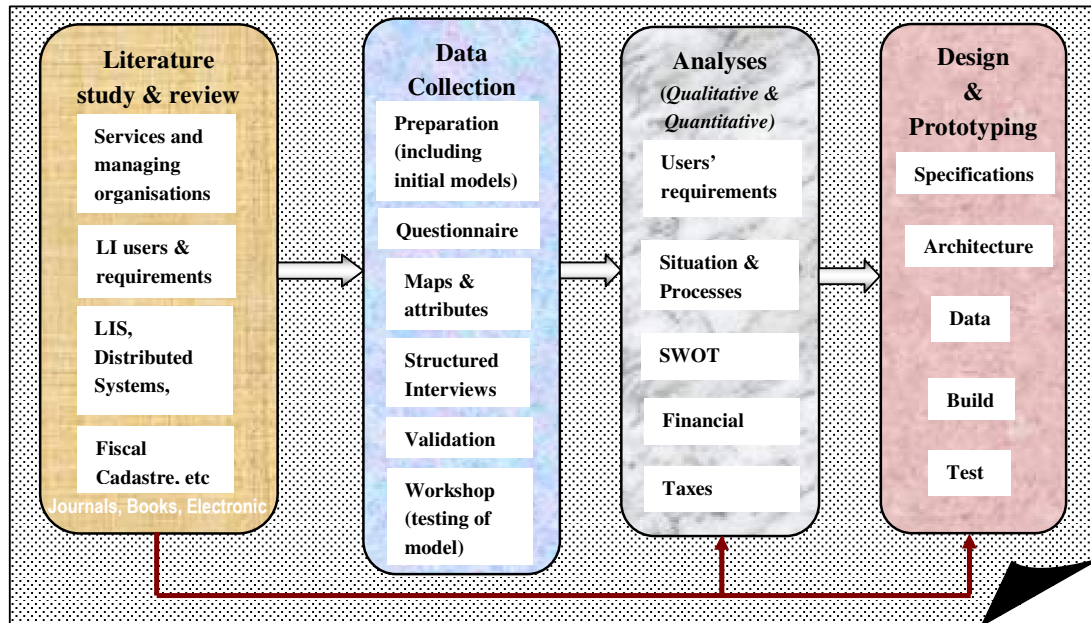


Figure 1-4 Methods proposed for the realisation of the research

1.8. Structure of the thesis

Chapter 1: Land information management in Nigeria

This chapter introduces the topic of the research. It describes the research problem, context and perspective of the investigation, describes relevant concepts, theories and prior studies. It provides a critical review of experts' opinions on improvement of accessibility to land registration and cadastral information.

Chapter 2: Organisational issues in land information service delivery

Interactions: provider-to-provider, provider to user, and user-to-user. Changing institutional arrangements and organisational structures of Land Information Services (LIServices) providers. Identification of core and other producers of LIServices. Continuous performance improvements and customers satisfaction. Public Private Partnership (PPP) and Public Private Cooperation (PPC). Example(s) of 'best' or 'good' practices in Africa.

Chapter 3: Status of land information and information flow in Nigeria

The result of the fieldwork will be analysed and presented in this chapter, adequate attention will be given to users' requirement survey and analysis. It will show the existing situation (processes, people and technology) of LIServices, problems and potentials. The chapter will also indicate the strengths, weaknesses, opportunities and threats of the core LIService producer.

Chapter 4: Land registration and cadastral infrastructure

Agreement on the level of integrated 'single-window' access to land information and specification of requirements (properties). Design and prototyping of a realistic

infrastructure as an improvement to the existing solution to provide the agreed level or degree of integrated ‘single-window’ access to land information. Technological issues: trade-offs between performance and type of technology.

Chapter 5: Land information business

Financial / fiscal aspects: cost of products and services and willingness to pay. Funding land registration and cadastral infrastructure and raising revenue from land (improving internally generated revenue through property and land taxation).

Chapter 6: Evaluation, implementation guidelines and conditions

Examining the components of the infrastructure to determine the extent to which specified properties are met. Appraisal of the system architecture and prototype (*depending on the realistic level*). Step-by-step implementation, success factors (performance indicators) / conditions for implementation.

Chapter 7: Conclusions and recommendations

This last chapter will summarise the outcome, limitations and opportunities of the research. Discoveries, results and conclusion. Recommendations for further studies.

Thesis chapters and research questions to be addressed in each chapter							
	Chapter 1: <i>Land information management in Nigeria</i>	Chapter 2: Organisational issues in land information service delivery	Chapter 3: Status of land information & information flow in Nigeria	Chapter 4: Land registration and cadastral infrastructure	Chapter 5: Land information business	Chapter 6: Evaluation, implementation guidelines and conditions	Chapter 7: Conclusions and recommendations
Research questions							
1		⊙					⊙
2		⊙					⊙
3	⊙		⊙				⊙
4	⊙			⊙			⊙
5					⊙		⊙
6						⊙	⊙

Table 1-3 Research questions and thesis chapters

1.9. Concluding remarks

This introductory chapter discussed functioning policies related to LIS service delivery in Nigeria and presents the research perspective within the context of the problems that the research would address, based on a theoretical backdrop, previous experience and studies. The benefits of GI; its sharing and problems associated with its non-availability were discussed with examples from past projects executed in Nigeria. A work plan was developed in the Microsoft Project to support the timely implementation and monitoring of the research.

2. Organisational issues in land information service delivery

2.1. Introduction

A service provider is a person or organisation whose business is to supply a particular service or good to the users or customers. Land registration and cadastral information service providers are organisations, mostly public agencies whose business or core activity is to carry out cadastral surveys, register rights in land, archive and provide such information to users for different uses. This chapter looks at the relationship between these providers and users and the changing institutional arrangements of LIService providers. The need for business orientation, customer focus and continuous performance improvement are discussed with examples from other industries. Some insights are given into development of cooperation between the government and private sector with a brief review of examples from Czech Republic, Great Britain and Canada. A short discussion of cadastral and land registration services in South Africa is also presented in the chapter.

2.2. Interactions: provider-to-provider, provider-to-user and user-to-user

The provision of cadastral and land registration services usually involves more than one organisation as shown in figures 1.1 and 2.1, the level of services provided by these organisations differs, for example an organisation may have the primary responsibility of cadastral surveys and land registration, while others are responsible for legal aspects, land valuation and transfers. There are other land service providers that may as well generate their own data sets and have competence to produce land and property-related information, as part of their responsibilities. The important consideration here is that there should be a many-to-many (m-n) relationship and interaction between the providers and users. In m-n relationship, many instances of one entity are associated with many instances of another entity. Interactions and good communication are required between the LIService providers, between providers and users, and between the users. The interaction between the users is to ensure that they have the maximum value for their money. The interactions will not only bring benefits to the users, but also to the providers in terms of being able to cooperate with the users, understand and develop facilities for their implicit and explicit needs.

2.2.1. Core providers and other providers

Core providers are the most essential and most vital part of the overall process of land information management. They carry out the substantial part of the land and property-related information collection and provision; though they may delegate some of their activities to other organisations (public or private) they are responsible for their products and services. Other providers are organisations being competent to produce land and property-related information, but this is not their primary responsibility. Other producers come in because the information required for a particular application is not available from the core producer or there are delays in the delivery of required services. Statutory responsibilities and jurisdiction may also allow for other producers, for instance, if different agencies are established for different levels of governance, e.g. local government areas,

districts and states and for urban and rural areas or for agricultural and non-agricultural lands. In any of these circumstances, the core provider plays a leadership role and coordinates the activities of the other providers to avoid duplication of efforts and overlaps. As presented in figure 2.1, the core provider is the first point of contact for the user and the contact may be through any possible means: electronically, physically and through the post.

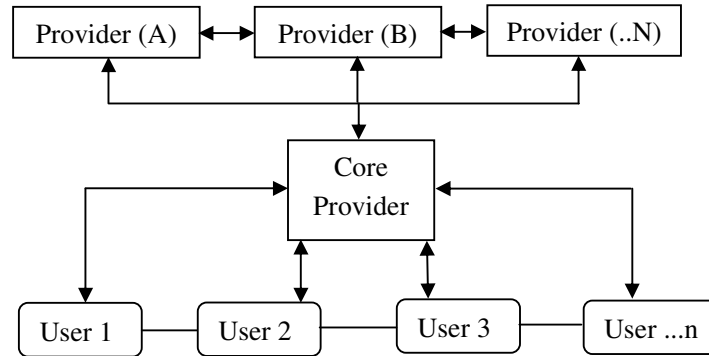


Figure 2-1 Interactions - LIService providers and users

The LUA makes it lawful for the Governor of each state in Nigeria to grant a statutory right of occupancy to any person for all lands, either urban or rural. The Ministry of Lands in each state of Nigeria performs this statutory function on behalf of the state governor for land in urban areas, while customary rights are administered by the local government councils for rural land. Normally, both the local government councils and the state's Ministry of Lands should be providers of land and property-related information in Nigeria. The Ministries of Lands are the core providers of land registration and cadastral information services in Nigeria because they have a legal mandate for the production and management of substantial part of land and property-related information. By the virtue of the LUA, the local government councils should also be core providers, but local government councils are passive in cadastral and land information management. Local Governments are charged with the control and management of land in non-urban areas, but are not specifically conferred with the power to issue any proof of a right of occupancy and are in other considerable areas subject to the overall control of the State Governors. The local councils are at the moment inactive in the provision of LIServices in Nigeria, thus they are classified as passive in table 2.1. There are suggestions for outright removal of local government councils from the implementation of the LUA and replace them with traditional chiefs and heads of families. There is also another point of view favouring outright removal of State Governors from the scene (Fajemirokun, 2002). The State Governors as the major actor in the implementation of the LUA is not a problem, rather the inherent problems in the LUA as discussed in section 6.4.1. While the Land Use and Allocation Committee is very effective at state level, the Land Allocation Advisory Committee for advising local government council on customary rights of occupancy are not in existence in most local governments. Thus, the designation of core providers as in table 2.1 is closely related to institutional issues and organisational arrangements. The Ondo State Development and Property Corporation (OSDPC) have the primary responsibility of urban and rural housing development, but they have to guarantee the tenure of property-owners. They acquire land, carry out their own cadastral surveys and issue deeds of sub-lease to their customers. They collect and manage their own information, but their activities cover very small parts of the state, thus are classified as other providers in table 2.1. The Ministry of Agriculture, Forestry and Natural Resources collect thematic data such as soil types and vegetation. But, at times there are questions of: who has what? This should be easily answered by the local governments, but such answers are not

readily available. So the Ministry of Agriculture, Forestry and Natural Resources may have to carry out their own surveys, hence, it may come under the group of other providers.

The Ondo State Housing Corporation (ODSHC) was merged with Capital Urban Development Authority (CUDA) to form Ondo State Development and Property Corporation (OSDPC) by the current political leadership of the state. This may be considered as a good step to integrate services, consequently reducing overhead costs usually transferred to the tax-payer.

S. No.	Producers	Role ¹
1	Ministry of Works, Lands and Housing (MWLH)	Core
2	Ondo State Development and Property Corporation (OSDPC)	Other
3	Ministry of Agriculture, Forestry and Natural Resources (MAFNAR)	Other
4	Local Government Councils	Passive

Table 2-1 LIService providers in Ondo State, Nigeria

The ad hoc users are infrequent or occasional users of cadastral and land information services. Such users may be private citizen or corporate organisations that requests for cadastral and land information services once in a while. While the regular users are clients that utilise cadastral and land information services regularly and serves as a major input in their day-to-day operations. Additional explanations on ad hoc and regular users are provided in section 3.8.5. Tables 2.1 and 2.2 gives the foundation for data collection or fieldwork presented in chapter 3.

S. No.	Users	Class
1	Ondo State Waste Management Board (ODSWMB)	Regular
2	Ondo State Water Corporation (ODSWC)	Regular
3	National Electric Power Authority (NEPA)	Regular
4	Nigeria Telecommunication (NITEL)	Ad hoc
5	Ondo State Board of Internal Revenue (ODSBIR)	Regular
6	Financial and allied institutions	Regular
7	Private sector professionals: land surveyors, lawyers, real estate agents, tax consultants, environmental consultants, architects, town planners, etc.	Regular
8	Citizens (natural and legal persons)	Ah hoc

Table 2-2 Classification of LIService users in Ondo State, Nigeria

2.3. Changing institutional arrangements and organisational structure of Land Information Service (LIService) providers

There should be a clear understanding of the responsibility of the provider to the user. There may not be direct accountability of a provider to the user, if for example the society has decided that a service should be provided not through a market transaction but through the government taking responsibility. Thus, we have a first group of producers that are funded from government budget and governed by public law and have an obligation to satisfy the interests of the government or politicians, and not customers or users. A second group of producers are governed by private law and funded by the market; they rely on their share of the market and profit for survival. In consequence, market share growth is a major concern for this category of producers. The third group of GI producers are

¹ Core / Other/ Passive

the service, customer satisfaction may be overlooked. This is a case of public or private monopoly and it is inevitable where there are high legal and security requirements, such as in land registration and where expensive infrastructure is required, e.g. the rail industry, electricity, water, etc. Public monopolies may be turned into business ventures, because competition may be highly unfeasible. This should be a shift from old-style bureaucracies to dynamic market driven processes with change of attitude of the executives from score keepers to leaders that are accountable to their customers (Tuladhar, 2004). One example of shift from old-style bureaucracies to dynamic market driven processes is the introduction of the Citizen's Charter by the British Government in 1991, which aimed at making government more efficient and customer-oriented. According to Haynes and White (1999), under the Citizen's Charter, each public sector organisation had to establish customer service standards, with input from their customers, to publish and to meet the standards. Organisations that meet these requirements would receive a "charter mark" indicating commitment to customer loyalty. The mark would be re-evaluated every three years based on continuous improvement. The charter is based on: "*standards of service, information and openness, choice and consultation, courtesy and helpfulness, having things put right, and value for money*". The effect of the citizen's charter as recorded for the British Rail (BR) shows that BR had improved service on many lines. On one line, it raised the percentage of trains arriving within 10 minutes of their schedule from 78% in 1991 to 88% by the end of 1994. In 1993-94, British Rail had to pay £4.7 million in compensation to passengers and £2.4 million in discounts to season tickets holders (excluding strike compensation). In 1994-95, the figures were reduced to £3.5 million and £0.2million (Haynes and White, 1999).

In USA Executive Order (EO) 12862 (Setting Customer Service Standards) of 11 September 1993 was the first major government policy to make public agencies accountable to their customers. The EO 12862 requires that all executive departments and agencies that provide important services directly to the public should take the following measures:

- identify customers who are, or should be, served by the agency;
- survey customers to determine the kind and quality of services they want and their level of satisfaction with existing services;
- post service standards and measure results against them;
- benchmark customer service performance against the best in business;
- provide customers with choices in both the sources of service and means of delivery;
- make information, services, and complaint systems easily accessible; and
- provide means to address customer complaints. (USA, 1996).

In Nigeria, there have been no clear efforts or direct steps towards making public LIService providers accountable to their customers. But, the public service of Nigeria is under pressure by taxpayers to improve its performance and to be alive to its responsibilities and to deliver timely services to the citizens. The governments at national and state levels in Nigeria are also embracing privatisation and cost recovery policies.

LIService providers as presented by in table 2.1 will fall into one of the eight groups shown in table 2.3. The global trend now is reduction in budgetary allocation to public GI producers and less control by government. Table 2.3 (arrows) shows a general shift from non-profit to profit orientation. An increasing trend or direction in table 2.3 is the shift towards non-profit orientation with market funding, under government regulation (8 to 4). This should be the position of public monopolies involved in land registration, because such a service may be difficult to privatise. The provision of

land registration and cadastral services in Nigeria is almost fully in the hands of government agencies that are full monopolists and may not give performance improvement the level of recognition it deserves.

2.3.2. Continuous performance improvement and performance indicators

Continuous Performance Improvement (CPI) in the delivery of LIServices may be achieved within the context of strategic and performance management. Strategic management is a dynamic process of aligning strategies, performance and business results; it is about people, leadership, technology and processes. It is a continuous activity of setting and maintaining the strategic direction of a business, making daily decisions to deal with changing circumstances and the challenges of the business environment. The role and relevance of ICT should be well studied and carefully integrated in CPI initiatives. Performance management set targets for services and products with a view to achieving improved performance. It primarily involves tracking performance against targets and identifying opportunities for improvement. The focus of performance management is the future and the organisational question to ask is what do we have to do and how can we do them better? (Acaster and Oglesby, 2004). The vital improvement objectives of LIService providers should be to establish integrated information systems, reengineer processes for higher quality and performance and develop collaborative efforts to link workflows across organisations. The political and legal, technological demographic², social and macroeconomic situations have to be considered in the establishment of information systems to support CPI within the framework of GDI initiative (Radwan, 2004a).

Assessment of customers' satisfaction is useful in CPI because it is impossible to improve a product or service that is not assessed and if a service or product cannot be assessed, it cannot be managed. In a simple statement, customers' satisfaction assessment is a useful input for CPI. It will provide information about inadequacies; consequently LIService providers can harness their resources (human and technical) to correct the shortfalls with a view to achieving improvement in performance. The appropriate use of Geo-ICT is not realistic without continuous assessment of customers' satisfaction. According to (Berwick et al., 1991), *"the best ideas for improving organizational processes come from the customers who depend on the organization's products and services. The reason is simple: Quality in the modern sense is defined as meeting the needs of customers. Who better than the customer can tell us what is needed and how we are doing?"* An equally important aspect of the CPI process is enhancement of internal functioning or operational performance. Operational performance indicators are very important for LIService providers because they are mostly public monopolies that are difficult to privatise because of high legal and security requirements that has to be directly supported by government. Such indicators will allow them to measure how well all land and property-related services are performing against set targets and will motivate the LIService providers in general to be accountable to the customers, even in a monopolistic market. Operational performance indicators for LIServices may include: friendliness and helpfulness of staff, openness and clarity of cost of products and services, payment possibilities / payment methods available, time-taken to fill request form, delivery times for all land and property-related services, service centre accessibility and contact by internet, fax, phone, post, in-person, parking space, waiting hall, etc. These indicators provide an approach to measure performance, optimise capital and operating expenses, maximise labour effectiveness and check that the organisation is meeting specified targets.

² People in an organisation

Table 2.4 provides a clear approach for LIService providers to access or measure their internal performance. The relationship between internal and external performance indicators is presented in figure 2.3. Two important considerations here are expectation and perception of services and products by the customer.

No.	Indicators	Unit of measurements	Description and example of indicators
1	Quantity	Specified duration (Year / month) in percentage or ratio or actual values.	<ul style="list-style-type: none"> Throughput: amount of product or services processed in given period, e.g. the number of statutory rights granted in a year compared with the total number of requests – output relative to input.
2	Quality	Year / month in percentage or ratio.	<ul style="list-style-type: none"> Data and information (products) delivered to users with errors. Parcels / plots resurveyed vis-à-vis the total cases processed. No. of cadastral survey cases exceeding the maximum response time limit.
3	Operating Cost	Per unit product or service	<ul style="list-style-type: none"> Cost of production of a specified service or product relative to the actual amount paid by users. Percentage of the budget spent on ancillary services and supporting staff.
4	Timeliness	Days, hours, minutes or seconds.	<ul style="list-style-type: none"> Response time: time taken from the submission of a request till it is fully processed. Processing time: time taken to complete the prescribed procedure for a product or service. Queuing time: time spent waiting for service.
5	Utilisation of resources	Percentage / ratio in hours.	<ul style="list-style-type: none"> Human resources: actual time an employee is busy. Technical resources: actual use of equipment e. g. computer hardware and software, GPS, total stations, etc.

Table 2-4 Internal performance indicators for LIService providers
(Adapted from (ITC, 2000))

The two are closely related to values, experience and background of the customer. Desires, references, experience and communication influences the expectation of a customer. While attitude, opinion and emotion determine the way the customers perceive services after delivery. According to (Molen, 2003), the “*level of customer satisfaction is dependent on the extent to which the customers’ experience with the products, services and assistance provided by the organization are in agreement with their expectations. The nature of these expectations is based on the customers’ needs, the experiences of others in their surroundings, their earlier experiences, and the information they have received about the organization*”. Perception is customers’ experience or feelings about concluded services and expectation is the act or state of looking forward to meeting customers needs. There is a need to be aware of customers’ implicit or hidden concerns, problems and potentials of the customers in the provision and delivery of land registration and cadastral information. This will ensure that the right or apposite information is provided when needed. In actual fact, the whole issue of availability (the quality of being at hand when needed) centres on meeting requests in a timely and proper way. Consequently, the completion time for activities becomes very important for LIService providers. Throughput (X) in figure 2.3 and described in table 2.4 is N/C , where N = number of parallel sequential processes (e.g. orders or requests) and utilisation of resources (U) = L/C , where L is the workload on the resources and C is the completion time (Sanni, 1998).

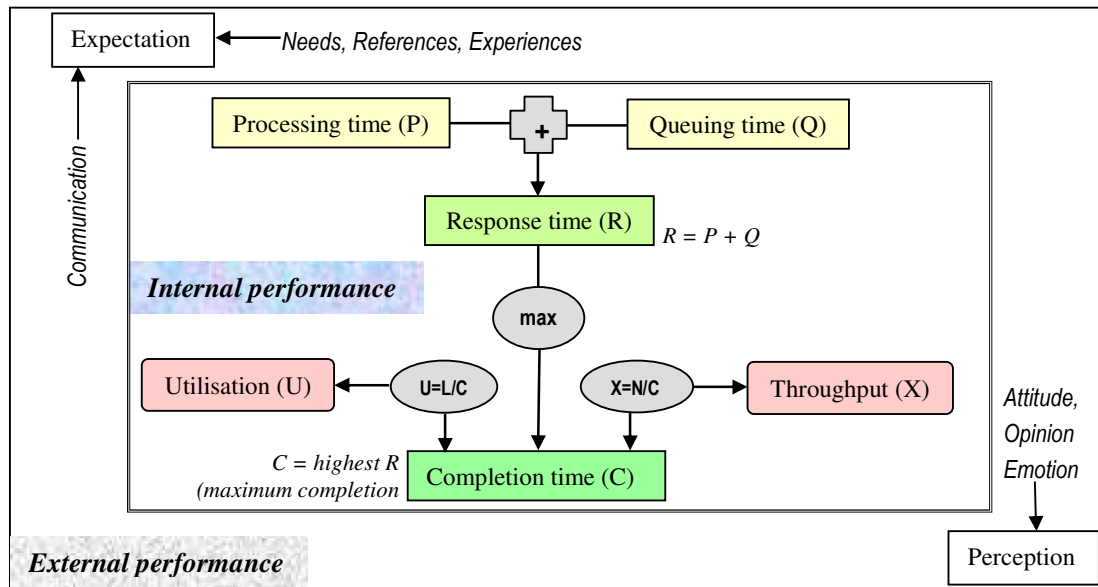


Figure 2-3 Internal and external performance indicators
Based on Molen (2003) and Sanni (1998)

2.4. Public Private Partnership, Public Private Co-operation and Privatisation

Public Private Partnership (PPP) is an arrangement or relationship under which at least a public sector and one private sector organisation work together in a business venture or creation and delivery of goods, services and infrastructure. PPP is a useful approach for meeting public needs by providing quality services and infrastructure on a cost effective basis. Consequently, it is an issue of interest in developing solutions for improving the availability of land registration and cadastral information in all countries. It is becoming increasingly obvious that most citizens want high quality LIServices provided on a timely basis without significant increase in the cost of the product and services. PPP offers an opportunity to do this under the changing institutional arrangements and budget cuts faced by LIService providers. A common argument against PPP is that there is an inherent conflict between the goals of the state and profit motivation of the private sector and citizens will suffer and lose when private companies get involved in functions that are traditionally the role of government. The statement credited to Governor Brad Henry of Oklahoma, USA that “*Government serves basic functions, but it doesn’t hold all the answers.public-private partnerships to get the job done when government can’t do it alone*” (NCPPP, 2003), sufficiently summarises the need for the involvement of the private sector in the delivery of public services.

The participation of the private sector is to complement the efforts of the government and not to take over the role of government in the provision of public services. The CCPPP defines PPP as a “*cooperative venture between the public and private sectors, built on the expertise of each partner that best meets clearly defined public needs through the appropriate allocation of resources, risks and rewards*”. All the parties involved in a truly PPP based agreement must be drawn in the planning, design, financing, building and operation stages or at least have a good knowledge of what is going on in all these phases, because each party shares in the risks and rewards potentials in the delivery of the service and/or operation of infrastructure. The level of participation at the various stages would be obviously different and the risks and benefits should be proportionally shared. Thus, one can see PPP as involving sharing of responsibility between government and the private sector. The five

fundamental issues surrounding PPP are: common interest (investors), public interest (citizens / customers), democratic control / rule of law, transparency and equality.

At the moment, the situation in Nigeria is that of Public Private Co-operation (PPC) in the delivery of public services, including land registration and cadastral services. The government plans and in most cases designs and invite tenders / bids from contractors to execute a project. In some cases, the planning and design may be contracted to consulting firms, but in all circumstances, the government has full control and one may wonder if it is appropriate to use PPC to describe such arrangements. Under PPC arrangements, risks and benefits are not equally shared and little attention is given to balancing the participation of the public and private parties involved. If the cadastral surveying component of a land registration process is contracted out to private land surveyors, this is a PPC. When private companies are involved in the planning, design, financing, building and operation of a land registration and cadastral infrastructure based on mutually agreed terms, there is a PPP. PPP and PPC should be carefully separated from Privatisation (PRV). PRV is a “*full divestiture or when a specific function is turned over to the private sector and regulatory control remains a public sector responsibility*” (CCPPP, 2004). PRV in the real sense of it should be a full transfer to the private sector, thus the delivery or provision of a privatised service or infrastructure would be profit-oriented, funded by market and governed by private (company) law. Though, public and private (company) regulations or laws are made by the government, there are significant differences between the two. There may be partial divestiture of LIServices to the private sector, while public sector retains the regulatory control responsibility. The success stories after the privatisation of the telecommunication industry in Nigeria points to the fact that PPP is able to achieve operational efficiencies, open access to private capital and create improvement in quality of services presently offered through PPC or solely by the government. A major PPP initiative in Ondo state is the OSDPC working in partnership with banks, mortgage institutions and private developers to provide reasonably priced houses for the people. The noticeable and admirable outcome of the partnership is the rebuilding of the burnt Erekesan Market in the centre of the state capital. The reconstruction started after the signing of an agreement between the State Government and Omega Bank Plc on 11th May 2004 (ODSG, 2004). The level of PPP in the proposed LRCI and how to make partnerships work in the provision of LIServices are discussed in section 6.4.3.

However, it is valuable or helpful at this moment to mention that the focus of the FGN is to reduce the dominance of the public sector in the economy and to allow the organised private sector to play its appropriate role as the principal actor and mechanism for growth and development. Through direct massive investment and participation, Nigeria has developed a large public venture. As at May 1999 the Federal Government investment in these public enterprises were in the region of US\$100 billion (BPE, 2003). According to BPE (2003), “*In spite of these massive investments, however, public enterprises have woefully failed to perform the functions and attain the objectives for which they were set up. The gross failure of these enterprises to live up to expectations is partly responsible for the current move towards economic liberalization, competition and privatisation. The philosophy behind privatisation therefore is to **restructure and rationalize the public sector** not only to lessen the dominance of unproductive investments in the sector but also to initiate the process of gradual cession to the private sector of public enterprises which are better operated by the private sector. It is also expected that the privatisation programme will provide the channel for reintegrating Nigeria back into the global economy as a platform to attract foreign direct investment in an open, fair and transparent manner*”. It is hoped that privatisation will bring some transparency into the system; the

Public Enterprises (Privatisation and Commercialisation) Act 1999 provides the enabling legislation for the carrying out of the privatisation and commercialisation programmes in Nigeria.

2.4.1. Models of PPP

An underlying characteristic of PPP has been identified as the investment of private partners in public infrastructure and provision of related ancillary services for the government or to the society on behalf of the government. Under this type of agreement, government and private party may work together under an arrangement whereby payments to the private sector party depends upon its continuous delivery of the specified services to the agreed performance standards (Webb and Pulle, 2002). It is worthy of note that PPP may take different forms depending on the goals of the partnership, but there must be absolute clarity about the input, tasks and responsibilities of all parties involved. This is better achieved by providing supportive legislations and policies. For instance, the government of the Czech Republic supports the introduction and application of PPP in any sector where it can bring advantages to the citizens in the provision of public services and infrastructure, both at the level of the central government and in regions. The model is centred on the role of the government as a partner and customer of the private sector while purchasing services from it. The private sector would provide public infrastructure (services) at its own cost and the government, in the capacity of the client, would pay regular fee in exchange for such investment until the expiration of the PPP agreement (Helikarová, 2004).

A British approach to PPP is PFI. The PFI involves significant capital expenditure by a contractor. The contractor is typically expected to invest in productive assets such as buildings, roads or other physical infrastructure or ICT systems. These investments are financed by private sources involving the issuing of equity and debt securities. Under PFI, contractors pay for the construction costs and then rent the finished project back to the public sector. This allows the British government to get new hospitals, schools and other infrastructure without raising taxes or cost of services. However, critics say that the government is just mortgaging the future, because long-run cost of paying the private sector to run these schemes is more than it would cost the public sector to build them itself – *BBC News Online: <http://news.bbc.co.uk/>* (BBC, 2003).

PPP agreements in Canada include among others the nine modes presented in table 2.5. Figure 2.4 shows the degree of risk that the private sector would be bearing for each of the modes of PPP presented in table 2.5.

No.	Mode of PPP	Code	Explanation
1	Design Build	DSB	Private sector designs and builds infrastructure to meet public sector performance terms, usually for a predetermined price, so the risk of cost overruns is transferred to the private sector. (Many people do not consider DSB as a form or kind of PPP).
2	Operation & Maintenance Contract	OMC	A private organisation, under an agreement runs a publicly-owned asset for a specified term. Ownership of the asset remains with the public partner.
3	Finance Only	FIN	A private financial establishment funds a project directly or uses various methods such as a long-term lease or bond issue.
4	Design, Build, Finance & Operate	DBFO	A private organisation designs, finances and constructs a new facility under a long-term lease, and operates the facility during the term of the lease. The private partner transfers the new facility to the public sector at the expiration of the lease.

5	Lease, Develop & Operate	LDO	A public infrastructure is leased to a private agency, which develops the facility to agreed standard and it's operated by the private agency till the termination of the agreement.
6	Build, Lease, Operate & Transfer	BLOT	Private sector builds an infrastructure, leases it to the public sector and operates it till the end of the agreement period, when it is finally transferred to the public sector.
7	Build, Own, Operate and Transfer	BOOT	A private agency receives an authorization to finance, design, build and operate a facility (and to charge user fees) for a specified period, after which ownership is transferred back to the public sector.
8	Build, Own, Operate	BOO	The private sector finances, builds, owns and operates a facility or service for a period or time without end. The public controls are stated in the original agreement and through on-going regulatory instruments and procedures.
9	Buy, Build, Operate	BBO	The private sector finances, builds, owns and operates a facility or service permanently under predetermined state control. This is very close to privatisation.

Table 2-5 Canadian's examples of PPP

Based on (CCPPP, 2004)

2.5. Cadastral and Land Registration Services in South Africa

The Republic of South Africa (RSA) uses a land registration system involving an official recording of rights in land through deeds. The deed registration is decentralised and carried out by the Department of Land Affairs through nine Deeds offices in Pretoria, Cape Town, Johannesburg, Pietermaritzburg, Bloemfontein, Kimberley, King William's Town, Vryburg and Umtata. The country has been implementing a coordinated cadastre for over fifty years and all modern surveys are based on the South Africa geodetic control network - Cape Datum, with reference to the World Geodetic System 1984 (WGS84), which contributes to uniform standards of accuracy. This integrated system consists of approximately 52,000 control points distributed throughout the country (Conrad and Nga-Fong, 2002). Surveyed boundaries together with its diagrams are examined and approved. In RSA, litigation with respect to property boundaries is rare and when disputes do arise, instruments in the Survey Act provide agreement procedures and arbitration rules for professional land surveyors (Conrad and Nga-Fong, 2002). Land registration process is normally completed within 10 working days from lodgement (DLA, 2004a).

The key features of the RSA land registration and cadastral system in comparison with the situation in Nigeria are described in table 2.6. Nigeria and indeed other African countries have a lot to learn from the experience of South Africa. It is not an over-statement or exaggeration to say that South Africa is an example of 'good' practice for land registration and cadastral services in the African continent. A more detailed discussion on cadastral and land registration services in South Africa is provided in appendix 1.

No.		South Africa	Nigeria
1	Population	About 40 million	About 137 million
2	Land registration system	Deeds	Deeds
	Legislation	Deeds Registries Act No. 37 of 1997	Land Use Act Cap 202 Laws of Federation, 1990
3	LIService provider(s):		
	• Registration of rights in land	Nine Deed Offices of the Department of Land Affairs (DLA)	36 States' Ministries of Lands and Federal Territory
	• Cadastral (boundary) surveys	Four Surveyor General Offices of the DLA, with one office of Director, Cadastral Information and a Chief Surveyor General.	36 States' Ministries of Lands and Federal Territory
4	Survey coverage (Completeness)	50% coverage by computerised maps in digital format, 30% coverage by coordinated maps and 20% in other forms.	No reliable data. All lands under 'leasehold' are well surveyed.
5	Significant improvement	Recent land reform in 1994 with the revised land survey act. Nationwide GPS control network.	Nationwide GPS campaign by the Federal Survey Department.
6	General remarks	Low land value and development potential. Little attention in land security by general public due to expensive and lengthy registration.	High cost of registration and official intricacies prevent most rural dwellers from applying for C. of O.
7	Working procedure	Mixture of analogue and digital (<i>full digital cadastre</i>). Internet and web integration. E-Cadastre vision.	Completely analogue. No e-cadastre vision.
8	Openness	Public register are available for inspection and copying by any person.	Information in the Public Record Keeping Card and Property Cards are available to land occupiers or their agents and legal representative.

Table 2-6 Basic features of the RSA and Nigeria land registration and cadastral systems

2.6. Concluding remarks

Any effort to improve land registration and cadastral services without sufficient consideration for organisational and institutional issues will not yield the desired results or dividend. Other equally important considerations such as interactions between the actors in LIService provision and utilisation, and performance measures were discussed in this chapter. The global change in the institutional arrangements of GI producers necessitated the review of private sector cooperation and participation, with reference to success stories or examples from other industries. The achievements in the LIService industry in RSA are points of reference for Nigeria. If RSA could achieve this level of success; why not Nigeria? The subsequent chapters attempt to answer this question and proposed solutions for improving the situation.

3. Status of land information and information flow in Nigeria

3.1. Introduction

The data collection approach and analysis of field data are presented in this chapter. Other important issues considered are users' requirements, processes, people and technology. The status of land information is well thought-out within the context of present situation (AS IS) of providing land registration and cadastral services in the study area and a model of the proposed situation (TO BE) is presented with a view to improving the availability of land registration and cadastral information. The TO BE was validated with stakeholders and users in a workshop carried out as part of the fieldwork and reviewed during interviews. Strengths, Weaknesses, Opportunities and Threats were analysed to provide strategies for the realisation of the proposed situation.

3.2. Nature of the fieldwork

The fieldwork took place mainly in Akure, Ondo State, Nigeria from 26 October 2004 to 21 November 2004. Interviews were conducted with the LIService providers and users as shown in tables 2.1 and 2.2. The fieldwork confirmed that the MWLH is the core producer of land registration and cadastral information in Ondo State. Apart from stamp duties and bank payments, the entire activities take place in the MWLH. Thus, the interviews and discussions were mainly carried out in the MWLH. The OSDPC (formerly ODSHC) is also involved in the provision of LIServices and provides deed of sublease to its clients, but all instruments in Ondo State are registered at the deeds registry in the MWLH. Questionnaires were also administered and a workshop was held to test the model for improvement. These provided first hand information about the state of affairs or the situation under investigation and give opportunity for verification of the improved models with experts and professionals from related fields.

3.3. Data collection approach

The foremost intentions of the data collection and the fieldwork in general are to obtain information about the:

- status of land registration and cadastral services and
- requirements of users of land registration and cadastral information to serve as input in designing and developing solutions for improving the availability of land registration and cadastral information in Ondo State.

The data collection was realised in two segments, which may be described as primary and secondary data collection. The two parts of the data collection approach are shown in figure 3.1 and described in the subsequent paragraphs.

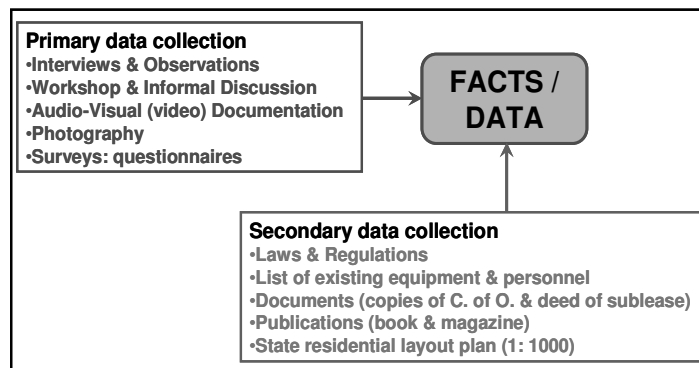


Figure 3-1 Collection of facts / data from primary and secondary sources

3.3.1. Primary data collection

This component of the data collection involves the gathering of the research's fundamental data directly in the study area. The methods (see figure 1.4) used are interviews, questionnaires and workshop.

- ❑ **Interviews:** Already prepared interview questions were asked the relevant officials of the MWLH and OSDPC. The structure of the interview is presented in appendix 2. Discussions and informal interview sessions were also carried out during the fieldwork. The discussions and interviews were later revalidated with the respondents.
- ❑ **Questionnaires:** Three questionnaires in appendices 3, 4 and 5 were administered to LIService / Geo-Information service providers, regular and ad hoc users. The first questionnaire (appendix 3) was designed to collect information about the nature of organisations (public, private, funding, etc), production processes, services and products, inter-organisational co-operations, etc. The questionnaires administered to the regular and ad hoc users are mainly for users' requirements survey.
- ❑ **Photography:** Pictures of the current situation at the Deeds Registry and Survey Office were taken. Some of the pictures of the situations to be improved are presented in appendices 6 – 13.
- ❑ **Workshop:** A one-day workshop titled "*improvement of availability of land registration and cadastral information in Ondo State, Nigeria*" was prepared and organised as part of the fieldwork on 16th of November 2004 at RECTAS, Ile-Ife, Nigeria. The workshop was attended by 44 participants from different relevant organisations such as universities, training and research institutes, civil service, private sector and professional bodies. The workshop invitation, programme and example of a completed registration form are presented in appendices 15, 16 and 17, with the opening and a cross-section of participants at the workshop in appendices 18 and 19.
- ❑ **Video documentation:** The workshop was covered with a professional video coverage on two cassettes of 180 minutes.
- ❑ **Observation:** This is primarily the watching of the technology and processes at work, e.g. the printing of 'diaz' (blue) prints of plans and state residential layouts, searching for records in the deeds registry and collection of application form for a customary / statutory right or occupancy of developed agricultural land.

3.3.2. Secondary data collection

The secondary data collected are existing published and unpublished information. They include:

- ❑ Laws and regulations;
- ❑ Records, such as organisational chart and staff list;
- ❑ Inventory of existing equipment;
- ❑ Large scale cadastral map (scale 1: 1000), see appendix 20;
- ❑ C. of O.;
- ❑ Deed of sublease and
- ❑ Copies of the deed registers and cards.

3.4. Validation of data during the fieldwork

The answers provided during structured dialogues were revalidated with the respondents within 48 hours. Discussions and general questions especially in the deeds registry were revalidated with the respondents after a few days. Areas of disagreements were resolved and represented for the approval of the respondents. The prominent and fundamental issues revealed during the interviews and discussions were revalidated in form of questions to participants during the workshop. For example the interest of the participants in e-LIServices was re-visited during the workshop.

3.5. Analysis of field data

According to Yin (1994), data analysis “*consists of examining, categorising, tabulating, or otherwise recombining the evidence to address the initial propositions of a study*” and should start with a universal analytic approach to give priorities for what to analyse and why. This points to the fact that researchers must provide sufficient time before going to the field, not only for ascertaining which data to collect, but also propose in advance the philosophy that will guide the analysis of the data. This standpoint was given sufficient attention before the fieldwork and the philosophy for data analysis for the research centres on:

- ❑ taking the full advantage of the facts / data collected during the fieldwork to have a detailed insight into the existing situation;
- ❑ revealing underlying structure and irregularities;
- ❑ detection of outlying viewpoints;
- ❑ filtering or refining models to reflect field observations and
- ❑ extraction of important variables to guide implementation.

Some of the results of the data analysis are presented in section 3.7 and the refined models of the current and proposed situation are in section 3.8. The results of the analysis as planned in figure 1.4 gave the following results: users’ requirements specifications (figure 3.3 and table 3.2), fees / taxes (table 3.3) and integrated SWOT analysis (table 3.6).

3.6. Accuracy of results, problems and limitations

To enhance the correctness of the evidence collected, a confirmation exercise was carried out as described in section 3.4. The results from the various sources were compared for consistency. All the sources of facts or data were reviewed and analysed together, based on the convergence of information from different sources. In consequence, findings or outcomes are likely to be truthful and

correct, because it is based on different sources of information following a corroboratory mode. An analysis of case study methods found that those case studies using many sources of evidence were rated more highly, in terms of overall quality, than those that relied on single source of information (Yin, 1994). Ellis et al (2003) also noted that a technique that involves checking one source of information against another improves the quality and accuracy of findings before drawing conclusions (Ellis et al., 2003). This procedure, often referred to as *triangulation* as used in this research is graphically described in figure 3.2 and explained in table 3.1.

The facts such as the need for online delivery of services, present level of customers’ satisfaction, willingness to pay more; analogue and digital forms of delivery of products and services; all-in-one payment; need to address white collar malpractices; required level of privatisation and PPP; and given choice, is it an organisation that customers would prefer to buy from. The responses or results on these issues from the major six sources were compared. When 4 out of 6 sources agree to a piece of evidence, it is taken as the actuality (*ac*), meaning that we have an acceptable finding. In effect, *ac* exists only where a piece of evidence is supported by at least 4 of interviews, questionnaires, photography, workshop, observation and documents.

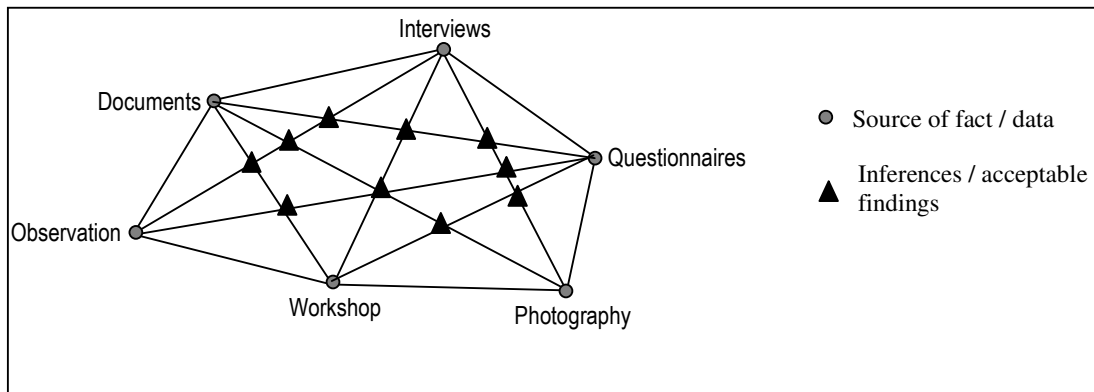


Figure 3-2 Triangulating facts / data from different sources

No.	Some of the facts triangulated	No. of (points) sources used	CR	Remarks
1	Online delivery of LIServices should be reserved for the future.	6	1.00	ac
2	Users are not satisfied with the present status of delivery of LIServices.	5	1.00	ac
3	Users are willing to pay more, if products and services are improved.	4	0.75	ac
4	Regular users will like to pay twice if the present level of services is improved.	4	0.00	ur
5	Ad hoc users will like to pay twice if the present level of services is improved.	4	1.00	ac
6	Users want both analogue and digital forms of delivery of products and services.	4	1.00	ac
7	All-in-one payment is realistic.	5	0.80	ac
8	There is need to address white collar malpractices.	5	1.00	ac
9	There is need to entertain restraints in the involvement of the private sector	5	0.80	ac
10	Given choice, the two LIService providers are organisations that customers would prefer to buy from?	3	0.33	ur

ac = (CR ≥ 0.67) and ur = (CR < 0.67; where ac is actuality, ur is unreality and CR is corroboration result

Table 3-1 Application of triangulation in analysis of facts / data

Thus, the threshold for accepting a fact in the triangulation is 0.67 , denoting that it occurs when corroboration result (CR) is greater than or equal to 0.67 . On the other hand, when we have a CR of less than 0.67 , the result is classified as unreality (*ur*), suggesting a state of being insubstantial, therefore not existing objectively or in fact.

3.7. Outcome of fieldwork and data analysis

3.7.1. Result of the interviews, questionnaires and discussions

- i. **Nature of organisations:** The fieldwork revealed that there are 2 providers of land registration and cadastral information in Ondo State. These organisations are MWLH and OSDPC. Most of the activities take place in the MWLH, where the only deeds registry in the state is situated. The OSDPC has a survey department that carries out its cadastral activities and a deed of sublease is prepared by the legal department for registration at the only deeds registry in the state. The 2 providers are fully public (non profit-oriented and entirely funded by government), but have some cost recovery drives. One of the core activities of the MWLH is GI production with a PPC direction, while housing and infrastructure development is the core activity of OSDPC, with PPP focus. The surveys show that most of the regular users (about 80%) are fully private organisations (profit-oriented and completely funded by market) and only about 13 % are fully public (non profit-oriented and entirely funded by government). The remaining 7% are public agencies with partial cost recovery and partial government funding. The conclusion from the survey is that private entrepreneurs are the main regular users of land and property related information in the study area.
- ii. **Technological issues:** The 2 providers use purely analogue working procedures. Most regular users, especially surveying firms have few computers that are not fully utilised. But, 81% of the ad hoc users interviewed are not computer literate and do not have access to a computer. The remaining 19% that are computer literate have access to computers mainly at business centre / internet café and at work. The 2 providers and all users do not have a website and greater part does not have access to internet in the office. The majority is not familiar with online delivery of LIServices. The providers are not planning for online delivery of services, at least not as a priority for now.
- iii. **Information requests:** The information that is considered indispensable to the regular users and the level of importance attached to individual information as revealed by the survey is represented in figure 3.3. The information commonly requested by ad hoc users are in table 3.2.

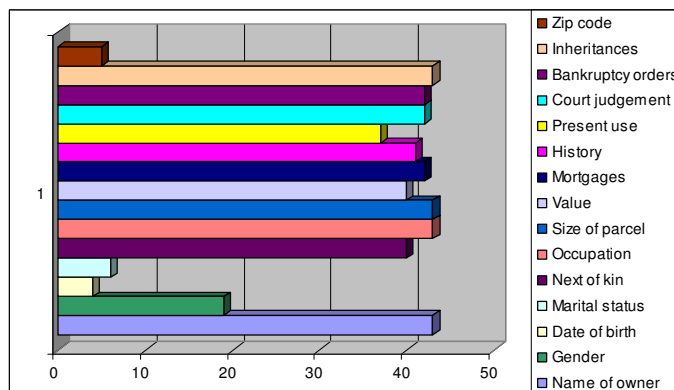


Figure 3-3 Parcel related information required by regular users

Group of information required	Specific information required
(A) Ownership:	1. Name of owner
	2. Address of owner
	3. Gender
	4. Marital status
	5. Next of kin
	6. Occupation
	7. Inheritances
(B) Spatially related information:	8. Large scale cadastral maps (scale greater than 1: 5,000)
	9. Survey plan of individual and adjoining parcels (Location)
	10. Survey plan of individual parcels only
	11. Layout and master plans
	12. Size of parcels
	13. Zip Code of property
(C) Legal and administrative:	14. Adjudication reports
	15. Parcel subdivision reports
	16. Surveyor General's approval
	17. Land allocation announcement
	18. Court judgments
	19. C. of O. confirmation
(D) Economic aspects and use:	20. Assessed value
	21. Fees, such as ground rent
	22. Mortgage status
	23. Leases / Sublease
	24. Bankruptcy orders
	25. Current use of parcel

Table 3-2 Products, services and information requirements of ad hoc users

iv. **Delivery of products and services:** At the moment, all products and services of the providers are analogue. Nonetheless, 54% of the regular users surveyed would like to receive products and services in both digital and analogue formats, 39% wants digital delivery and 7% prefers analogue.

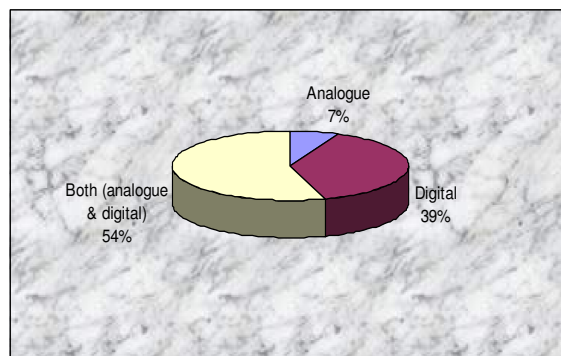


Figure 3-4 Mode or form of delivery of products and services wanted by regular users

This result is represented graphically in figure 3.4. Conversely, most ad hoc users' wants analogue services and products as presented in figure 3.5.

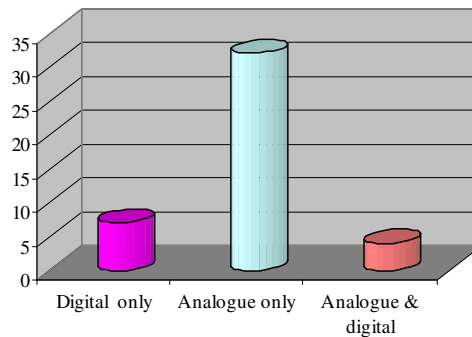


Figure 3-5 Form of delivery information and services wanted by ad hoc users

- v. **Cooperation and information flow:** There is no regulation or policy in Ondo State that promotes formal relationship or co-ordination between organisations responsible for registering land rights, cadastral surveys and mapping, land valuation, land use, etc. However, the need for formal exchange of information between organisations and departments involved in GI services was evidently appreciated. According to one of the respondents, “*Some activities are usually overlapping - no need for repetition or duplication of work. This is very important to conserve funds because the government is cutting expenditure and more careful about funding in recent times*”. Apart from belonging to professional bodies, there is also no formal cooperation among the regular users and as expected among the ad hoc users. So information flow and contacts is mainly between the producers as presented in figure 3.6 contrary to the concept presented in figure 2.1.

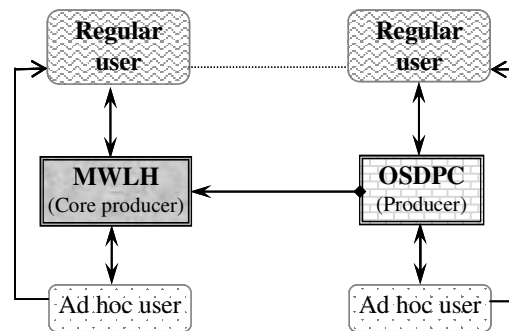


Figure 3-6 Information flow and contacts

One important outcome of the interview with the ad hoc users is that, more often than not, they prefer to go through the regular users (land surveyors, real estate surveyors, town planners, lawyers and architects) for LIServices. According to some ad hoc users, they prefer this approach because “*things are quicker through them and they know the people and the system very well*”. This is represented as a unidirectional information flow and interaction from ad hoc user to the regular user in figure 3.6, because it is the ad hoc users that always initiate the process.

- vi. **Fees and taxes:** It was impossible to get properly documented data related to fees and taxes. Current charges based on interviews are shown in table 3.3. Apart from the informal “*acceleration fees*”, all the fees must be paid in bank and evidence of payment (bank teller) must be produced before official receipts are issued to initiate actions for the requested service.

No.	Description of fees and taxes	Cost / price	
		Nigeria Naira (₦)	USA Dollars (\$)³
1	Registration Fees	500.00	3.80
2	Consent Form: commercial (C)	1,000.00	7.60
3	Consent Form: private (P)	500.00	3.80
4	Capital Gain Tax⁴ on undeveloped land	10% of profit	
5	Capital Gain Tax on developed property	15% of profit	
6	Tax on undeveloped land	60% of value	
7	Stamp duties: assignment	6% of value	
8	Stamp duties: mortgage (13 Kobo on N1,000.00)	0.013% of value	
9	Others: ⇒ Three years tax clearance: evidence of payment of income tax for the last 2 years and current year. ⇒ Ondo State development levy: evidence of payment of annual development levy for the last 2 years and current year. ⇒ Up-to-date payment of Ground Rent is mandatory for all transactions.		
10	Acceleration fees: off the record, but can step up processes and bring desired results.		

Table 3-3 Fees and taxes

vii. **Users / Customers satisfaction:** An indirect question was asked to get facts relating to the feelings of the users. 78% of the ad hoc users would not like to request for the services and product of the providers because of delays in delivery of services (too long time) and facilitation money.

viii. **The Register, Public Record Keeping (PRK) Cards and Property Cards (PC):**

Records in the deeds registry are stored on:

- registers;
- public record keeping (PRK) cards and
- property cards (PC).

No.	Type of information	Description
1	File Number	The official number of the file that was used to process the C. of O. to the point of registration.
2	Grantor	The person transferring the interest in real property to the other. By the virtue of the Land Use Act, the Ondo State Government (ODSG), at the first instance.
3	Grantee	The person (natural or non-natural) who receives from the grantor a grant of real property, in this case the person in whose name a right of occupancy is issued.
4	Date of registration	The date the instrument was registered.
5	Registration particulars	Additional information relating to the registration, e.g. volume number.
<i>Grantor and grantee differs on the PRK and PC. If there is a mortgage on the property, the grantor is the occupier (the person in whose name a right of occupancy is issued) and the grantee is the financier or mortgagee.</i>		

Table 3-4 Information on deeds register

³ Rate US\$1 = 131.62 Nigeria Naira (₦)

⁴ Tax on the **profit** ensuing from the sale or exchange of a capital asset such as stocks, bonds, and real estate

The register contains the information shown in table 3.4, while the information on the PRK are: survey plan number, receipt number, file number, serial number, date of approval of C. of O. and registration particulars. The PC contains: date, reference number, location, status of instrument: conveyance, mortgage details, etc., volume number, page and date of registration.

The information contained in the PRK card is not available to the public. It is only available to the holder of the right of occupancy or a legal practitioner representing the possessor. The criteria usually used for searching the PRK are name of owner, street name or location of property and history.

- ix. **Willingness to pay:** The underlying factor and motivation to pay is timely delivery of required products and services to specifications. The surveys analysed in figure 3.7 shows that 68% of establishments that are regular users are willing to pay and will pay higher prices for improved or enhanced land registration and cadastral products and services.

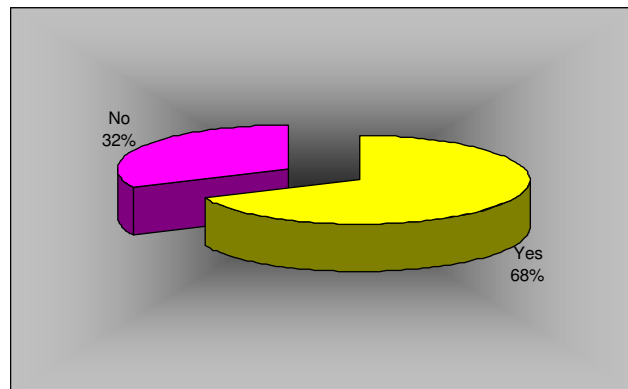


Figure 3-7 Willingness to pay higher prices for improved services by regular users

If the present level of delivery of LIServices is improved, a higher proportion of around 80% of ad hoc users (figure 3.8) are positive about paying more.

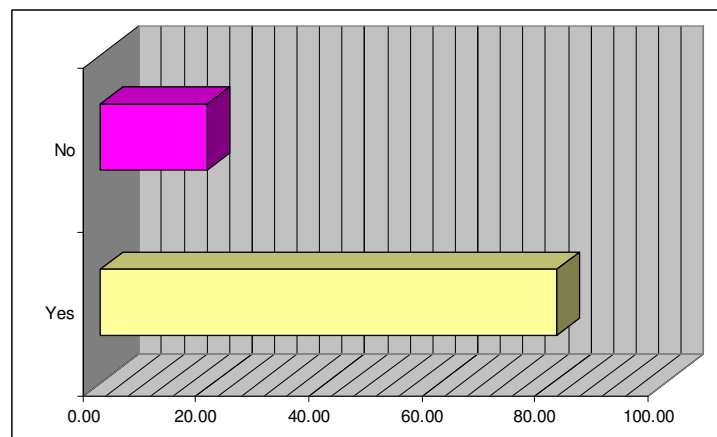


Figure 3-8 Ad hoc users willingness to pay more

3.7.2. Summary of workshop findings

Workshops are becoming increasingly important as a technique of data collection, especially for applied researches and systems development. It is a flexible and interactive way of investigating problems, share knowledge, develop solutions or facts and make decisions (Groenendijk, 2003). During the workshop, all the participants had equal opportunities to contribute to discussions. In some

cases some participants were specifically requested to comment on issues that they are directly involved. The most relevant issues discussed during the workshop are summarised in table 3.4.

No.	Summary of foremost and essential points
Users:	
1	Pay attention to the users, know their needs and anticipate problems. Experts and professionals should “ <i>be ahead of their users and think for the users</i> ”.
Precision:	
2	Charting should take place after the checking of documents at the Unified Service Centre (USC). The idea that charting should take place after checking of documents at the USC was also pointed out during structured interviews and informal discussions.
Fees and payment:	
3	It is difficult to make payment only once, because the processing is in stages to allow checking and verification. If payment is made once, this may sideline the effect of the checking and verifications, which are quality control measures, especially with the infiltration of “quacks” in surveying (inaccurate surveys) and real estate management. A suggestion for 2 times payment, with the second payment after the outcome of the publication.
4	“All-in-one” fee is possible after checking and verification.
5	The only problem with all-in-one fee is objection after the mandatory publication. But, this will make the applicants and their agents more careful and sure of their requests for statutory rights in land. Anyhow, if there is an objection, money paid could be returned if it is not possible to resolve the objection. The most important thing is that the fees should be calculated in stages. The public should be aware of the way the all-in-one fee is computed. “ <i>The financial aspect is very sensitive and should be very understandable</i> ”.
6	There must be full payment before services could be rendered.
Multiple registrations:	
7	Solution to the problem of multiple registrations: Speed up actions on the mapping of Ondo State (1:5000) and survey controls establishment and extension (with GPS). Proper checking and editing are also important to fix the problem of multiple registrations. Networked, digital working environment may also be a solution.
Administration:	
8	There is a need for re-planning, re-structuring and general overhauling of the system. The whole system (<i>deeds, surveys, property valuation, accounts, administration, etc</i>) should be refurbished to work together as a one strong and reliable entity.
9	There are unnecessary administrative bottlenecks. Think of autonomy of organisations dealing with land administration – an independent organisation. Do not focus or concentrate only on technology, institutional and administrative issues are equally important.
10	The research should come out with recommendations on manpower development, funding, quality of services and sustainability of the improved system – “ <i>Right now, it is difficult to maintain or manage the present analogue method, how are we sure that we’ll be able to uphold a digital technology. I am not pessimistic, but I think these are relevant issues for consideration at this point</i> ”.
Spatial data / mapping:	
11	A pressing requirement is to have master plan or base map. Survey controls extension is in progress in Ondo State and the next step will be the mapping of the state. The government is currently reviewing tenders submitted for the mapping.
12	The decimal precision always required by survey regulations may not be necessary in many cases.
Private sector involvement:	
13	Public Private Participation (PPP) should be handled with care. PPP may worsen the situation. The rich private entrepreneurs may ‘strangulate’ the people and make land administration services only available to the minority, but rich and influential people in the society. “ <i>A country will do well if most of its essential services are not in private hands. Land registration should not be left in private hands for security and economic reasons</i> ”. “ <i>It is not advisable to allow the custody of cadastral and land registration to be in private hands</i> ”. Security of data is very important. Cadastral aspect and IT services may be handled by private sector. But, land registration data should not be left in the hands of the private sector.
Ethics:	
14	Re-orientation of staff and leadership by example. “ <i>There can be no development in a corrupt society, if there is corruption all other evils will follow</i> ”. “ <i>If we are corrupt, we cannot have anything, we cannot go anywhere. If we want to remain corrupt, we cannot get anywhere</i> ”. “ <i>Change of attitude from the high places</i> ”. The poverty level is very high and the government should redress this issue. We need to be more disciplined and put Nigeria first.

Underlying infrastructure:	
15	Telecommunication and electricity are necessary for improving any type of service. This is the least that any government could do to improve the quality of life of its people.
Legislation / policy:	
16	Control and monitoring regulations are important and the need to work with relevant professional bodies.
17	A review of laws and regulations in surveying and mapping by the Surveyors Council of Nigeria is in progress.
Implementation and funding:	
18	The first problem that we have to deal with is how to improve services, even under the present analogue working system. The next step would be to take advantage of the digital technology to improve services. Then, we may be thinking of online services. But, <i>“we have to put our house in order first”</i> .
19	Adequate attention should be given to research and development in Nigeria. The research should note the issues that are relevant (valid) in our environment.
20	The politicians are indisposed to spending on surveying and mapping. There should be realistic funding solution.
Issues for future consideration:	
21	Parcel definition in the full third dimension (3-D) – <i>‘many persons ownership’</i> , e-Banking, e-Land Administration, etc.
22	The research should reveal an implementation plan in phases and indicate the ultimate for the future in Nigeria. Implementation of the proposal for improvement should be in phases.
23	Electronic signature still have some considerations, we really have to be sure and have confidence in the system.
24	Comment on online services: <i>“Government cannot sustain LIS now, why talking of e-LIS? It should be reserved for the future”</i> . E-LIService is a thing for the future.
25	You have to think ahead. <i>“You don’t wait until you have a problem before you start addressing it”</i> (Kufonyi, 2004a). The major discussion here was on online services. The prevailing view was that one could think of strategies for online services ahead of time and hold out approaches for execution, without waiting till when the requests for such services starts coming from the users.

Table 3-5 Outline of the workshop outcome

3.8. Models of present status and proposed situation

The current and proposed situations were analysed and modelled using Unified Modelling Language (UML). The existing structure and behaviour of the situation was modelled using activity diagrams, thus present circumstances were revealed and consequently built on to provide a new model for improvement. Activity diagrams create the opportunity to observe and document parallel and concurrent activities. Hence, they are convenient tool for modelling workflows and dealing with multi-threaded functions such as land registration and cadastral systems. They show the flow from activity to activity within a system and models the functions of a system (Tuladhar, 2003).

At the moment, the land registration procedure in Ondo State starts with seeking the approval of the Surveyor General (SG) for the survey plan of the land intended for registration, followed by a formal request or application for statutory right of occupancy. The activities involved are incoherent, but modelled under two headings: Surveyor’s General approval of survey plan and granting of statutory right of occupancy. The first model in figure 3.9 presents the processes involved in securing the approval of the Surveyor-General for a survey plan with a view to applying for a statutory right of occupancy. The model in figure 3.10 illustrates the processes involved in the granting of a statutory right, which is completed with the issuance of a C. of O. The model in figure 3.13 is a solution for improving the existing situation. A draft was tested with the users and stakeholders during the fieldwork. The requirements for achieving the expected situation were also identified during the fieldwork.

3.8.1. Modelling of the present situation

3.8.1.1. Surveyor's General approval of Survey Plan

The model in figure 3.9 is an activity diagram with 3 partitions, namely: Applicant, Registered Surveyor (RS) and Surveyor's General Office (SGO). The applicant may be a private individual, corporate body, group or association. The process is initiated with the request by the applicant for the services of a RS for survey of land. The job of the RS may be concluded with the production of survey plan and delivery to the client, if the client does not request for Surveyor General's approval. But, one of the conditions for applying for a statutory right is an "approved survey plan". An approved survey plan is the plan of a survey carried out by a RS in accordance with survey laws and regulations of Nigeria and subsequently endorsed by the SG of the state in which the land is located. The prescribed fee is calculated in the SGO based on the size of the plot and the applicant will make the payment (payment is made in a bank; this is not depicted in the diagram as a separate party). If the survey records (field data, computation and survey plan) are acceptable, field verification may be carried out. The approval of the SG is then sought for the survey, which is evinced by the endorsement of the survey plan by the state's SG. The process as shown in figure 3.9 ends with the delivery of approved survey plan to the applicant.

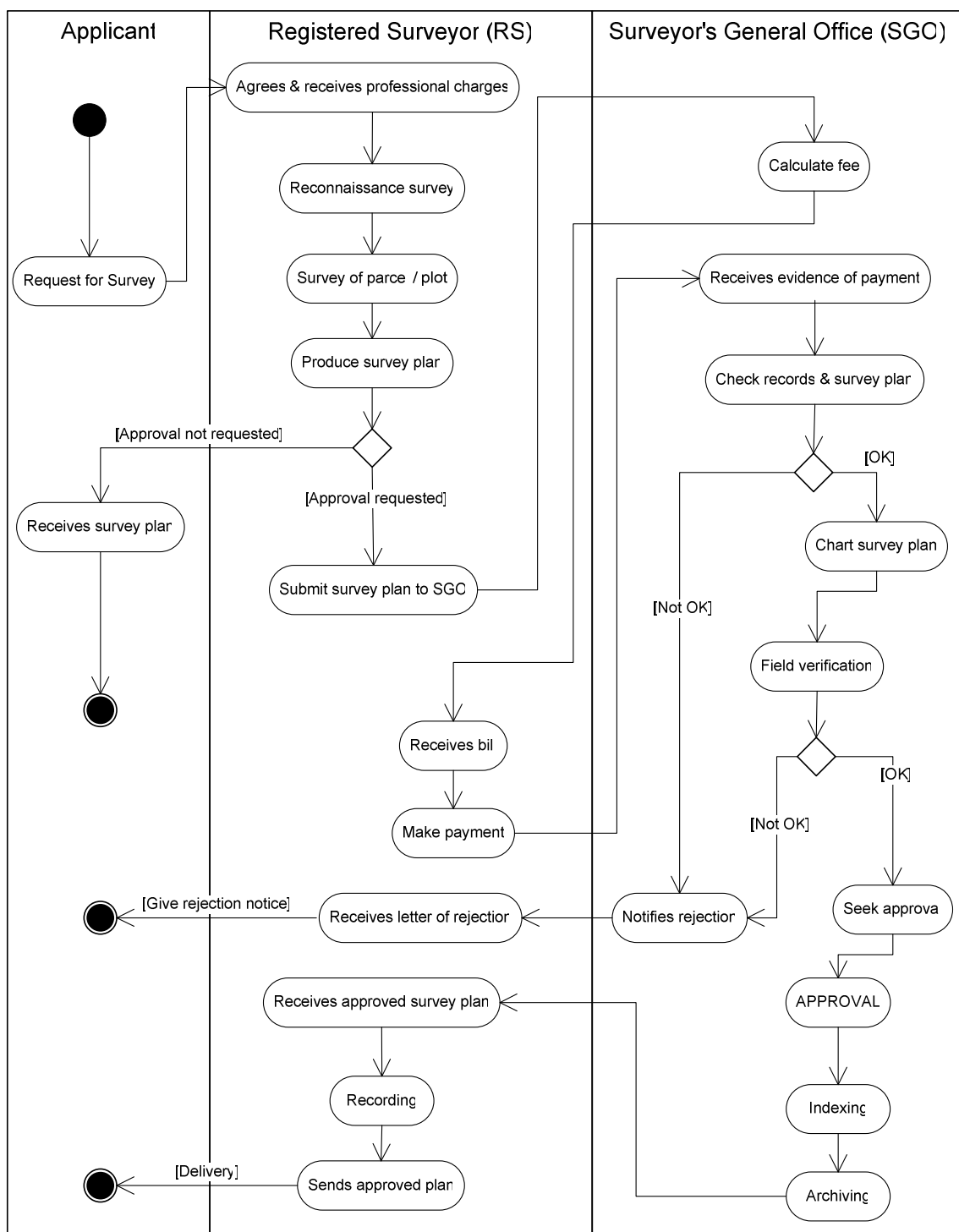


Figure 3-9 Activity diagram for Surveyor's General approval of a survey plan
(Current Situation)

3.8.1.2. Granting of a statutory right of occupancy

The granting of a statutory right of occupancy is also modelled with an activity diagram with 3 partitions, labelled Applicant, Lands Department (LD) and Board of Internal Revenue (BIR). The LD of the MWLH is responsible for land registration and related activities. The BIR is in charge of taxes, levies, tariffs and other government income within the state. The applicant for a statutory right of

In some cases, the form may be issued but it must be submitted with the evidence of payment. After receiving the form from the applicant, the LD checks the application form and the accompanying documents: survey plans; payments receipts of developments levy for two preceding years and the current year; sketch map of the site; etc. When the form and attached documents are unacceptable, the applicant is notified and when they are acceptable, a processing fee is calculated and a bill is sent to the applicant for payment. The applicant pays the calculated fee in the bank (payment is made in a bank; this is again not depicted in the diagram as a separate party) and submits evidence of payment to the LD to allow the continuation of the processing. A site inspection will be carried out, and this will be followed by a publication of the request in a daily newspaper with invitation for objection to the granting of the statutory rights. If there is no objection, the LD proceeds to prepare deed documents for the approval of the Honourable Commissioner. After the Commissioner's approval, the deed document is sent to the BIR. The BIR will calculate the amount payable for stamp duty; afterwards the applicant pays to the bank. When the evidence of payment is submitted, the BIR implements the stamp duty on the deed documents and returns it to the LD. When the LD receives the documents, with stamp duties, the applicant is entitled to a statutory right of occupancy. The LD prepares the C. of O., keeps a copy delivers the original copy to the applicant.

3.8.2. Rationale for improvement

The fundamental reasons for proposing an improved system are the following bottlenecks identified in the present model / situation.

- Repetition of activities or tasks, e.g. fieldwork and checking of documents.
- Delays in delivery of services.
- Several payments: up to five times under the existing situation.
- Lack of appropriate resources: personnel, equipment and communication channels.
- Unsecured storage of information and documents, see appendices 6 to 13.
- Unlawful activities.
- Poor institutional arrangements and support, for example no law makes it mandatory to register any property in Ondo State. This is a weighty bottleneck, thus a compulsory land registration was considered as an important condition for implementation in section 6.4.5.
- Poor funding, sole reliance on government funding and lack of access to internally generated fund. Government policy makes it mandatory for all earnings from LIServices to go straight to the state government purse. The service provider does not have direct access to the state purse. The indirect access is a lengthy process largely hindered by administrative bottlenecks.

3.8.3. Integrated SWOT analysis of the MWLH

An integrated SWOT analysis is an effective instrument for investigating the overall strategic position of an organisation and its position in meeting its responsibilities. The need for SWOT analysis is becoming increasingly important with the changing institutional arrangements of LIService providers as shown in figure 2.3. The required strategies have to be identified and incorporated into the organisational objectives. A strategy is the direction and focuses of an organisation to create a challenging environment to meet the requests of its customers and to fulfil stakeholders' expectations through an effective arrangement of its resources. Thus, strategies represent the steps that have to be taken to move from AS IS to the TO BE as described in figures 3.11 and 3.12. They are adjustments to prevent or correct problems or deficiencies, to emulate 'best' practices and execute innovative

reforms (Radwan et al., 2001). It is imperative to mention that that SWOT analysis can be very subjective; two people may not come out with the same version of a SWOT analysis even when given the same information about the same organisation and its environment. Consequently, SWOT analysis is best used as a guide and not as a prescription (Riley and Riley, 2004).

Matrix arrays of internal strengths and weaknesses against external opportunities and threats provided the various strategies (S-O, W-O, S-T and W-T) in table 3.6, but improvement of availability of land registration and cadastral information can only be achieved if organisational policies support the strategies. BPR has been described in section 1.3. The development of the improved system (proposed system) will be based on BPR approach described in section 1.3. In this research, SWOT analysis is used to audit internal and external environment of the core producer’s organisation (MWLH) as input for re-engineering process for the new system as portrayed in figure 3.11.

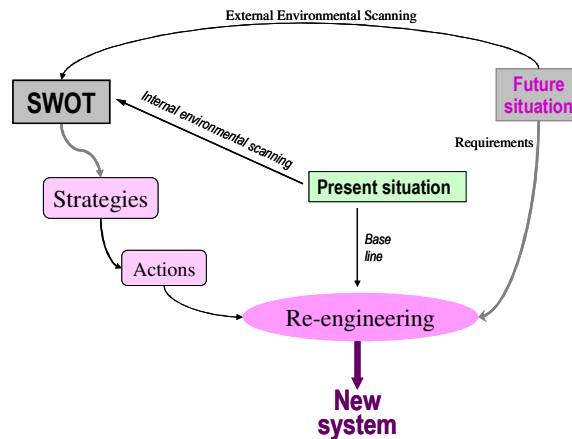


Figure 3-11 BPR approach to the development of an improved system
Based on (Paresi, 2005)

Cadastral and land registration infrastructure is the nucleus of social stability, capital development and economic success of a nation, it may be managed within a semi-independent establishment with clear **mission, vision, goals, strategies** and **scenarios**. A mission is a brief statement describing an establishment and the purpose the organisation is founded to serve. A vision describes in clear terms how to achieve the mission, while goals are specific targets to be realised within the context of mission and vision. Goals must be accompanied with criteria to quantify realisation of the goals or standards by which functioning can be judged or decided, this is commonly referred to as performance measures. Scenarios are alternative designs or options to realise strategies (ITC, 2000). In essence, strategies will provide a basis for matching organisational targets with specific measurable results expected within a specified period of time. As illustrated in figure 3.12 the gap between the current position and the desired future could be bridged with strategies in table 3.6. The actions for the realisation of the strategies are presented in table 3.7.

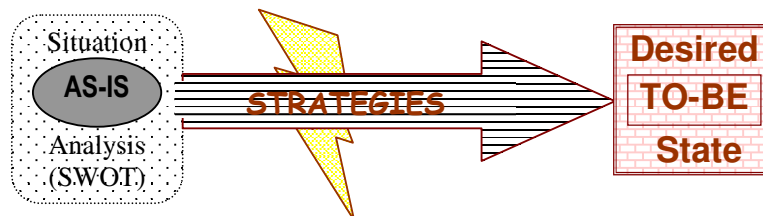


Figure 3-12 Bridging the gap with strategies from SWOT

<p>INTERNAL ANALYSIS</p> <p>EXTERNAL ANALYSIS</p>	<p>STRENGTHS (S):</p> <ul style="list-style-type: none"> (i.) Existing equipment (especially hardware) in the survey department provides a good starting point for digital mapping. (ii.) Good professional leadership and management. (iii.) Professionally qualified and talented staff. (iv.) Strong and clear interest in digital mapping, GIS and computerisation / automation of the deeds registry. (v.) Appreciation of the importance of inter-departmental cooperation. (vi.) Highly accessible office location. (vii.) Joint effort and team building culture (field survey parties). (viii.) Realisation of the need for inter-departmental cooperation within the Ministry. (ix.) Pleasant staff – cordial treatment. 	<p>WEAKNESSES (W):</p> <ul style="list-style-type: none"> (i.) Lack of effective organisational performance evaluation measures. (ii.) Administrative quality – no clear organisational structure and individual responsibilities. (iii.) Slow decision-making process (excessive red tape); inability to adapt quickly. (iv.) No effort towards genuine PPP. (v.) No clear pricing policy. (vi.) White collar malpractices. (vii.) No well-trained staff in Geo-ICT and low number of middle-level managers. (viii.) Base maps for “charting” are obsolete & mutilated or unavailable. (ix.) Insufficient motivation of staff. (x.) Lack of strategic marketing plan and customer orientation. (xi.) Slow delivery of services. (xii.) Inflexible work structure. (xiii.) Current state of technology – complete analogue working procedure. (xiv.) Poor communication infrastructure and network.
	<p>OPPORTUNITIES (O):</p> <ul style="list-style-type: none"> (i.) Opportunity for growth: expanding property market and increasing awareness. (ii.) Public monopoly; land registration function is difficult to divulge into the hands of the private sector. (iii.) Relatively attractive job in government establishments. (iv.) Cooperation with private sector (PPC). (v.) Government policy on computer literacy. (vi.) Conscious of the benefits and the necessity for cooperation with other organisations. 	<p>S-O STRATEGIES</p> <ol style="list-style-type: none"> 1) Carry out users’ requirements surveys and analysis to derive specific personnel and equipment needs. 2) Set up a structured approach to inter and intra organisational interactions based on mutual benefit and regulated standards. 3) Propose and seek government approval to involve private organisations in delivery of Geo-ICT services under a genuine PPP arrangement. 4) Build on the computer literacy programme of the state government.
<p>THREATS (T):</p> <ul style="list-style-type: none"> (i.) Declining government funding. (ii.) Out-dated laws, regulations and standards. (iii.) Full civic driven customers’ orientation. (iv.) Public Enterprises (Privatisation and Commercialisation) Act, 1999. (v.) Public monopoly (change of govt. policy and economic direction). (vi.) Poor communication infrastructure and network. (vii.) Customers’ dissatisfaction, e.g. going to different government departments for an answer to a question or for one service. (viii.) No direct access to internally generated revenue and complete reliance on government funding. 	<p>S-T STRATEGIES</p> <ol style="list-style-type: none"> 1) Gradual shift to a non-profit oriented agency, governed by public law, but funded by market. 2) Utilise intercoms and functional external telephone lines (wireless / mobile). 3) Develop a less hierarchical organisational arrangement with well-defined responsibilities. 4) Regular market surveys and evaluation of customers’ satisfaction. 	<p>W-T STRATEGIES</p> <ol style="list-style-type: none"> 1) Create a semi-autonomous bureau with sole responsibility of cadastral and land registration. 2) Remain in business, <u>but re-engineer</u> production systems (technology and processes) and introduce a comprehensive training programme. 3) Develop realistic communication plan.

Table 3-6 Integrated SWOT analysis for the MWLH

⁵ Criteria to quantify realisation of goals or standard by which functioning can be judged or decided

3.8.4. Actions for improvement

The actions or initiatives that describe how to achieve the improvement strategies derived from the integrated SWOT analysis of the MWLH are presented in table 3.6.

S-O STRATEGIES	
SO1: Carry out users' requirements surveys and analysis to derive specific personnel and equipment needs	
	<p>Actions</p> <ol style="list-style-type: none"> 1. Identify all users of land and property related information within Ondo State. 2. Group the users. 3. Conduct a comprehensive users' requirements survey. Analyse the result of the survey and come out with specific needs of each group. 4. Identify the resources (human and equipment) required to meet the users' needs.
SO2: Set up a structured approach to inter and intra organisational interactions based on mutual benefit and regulated standards	
	<p>Actions</p> <ol style="list-style-type: none"> 5. Design improved and direct communication channels between relevant Departments. 6. Represent the new design in form of simple diagrams, with different levels of access rights. Validate the design of the new communication channels with all the departments. 7. Open up discussion on formal cooperation with other organisations and form a network of cooperating organisations. 8. Develop an agreement for cross-agency cooperation on acquisition, maintenance and distribution and exchange of land and property related information.
SO3: Propose and seek government approval to involve private organisations in delivery of Geo-ICT services under a genuine PPP arrangement	
	<p>Actions</p> <ol style="list-style-type: none"> 9. Establish a Geo-ICT Unit. 10. Determine the personnel and equipment required for effective and efficient functioning of the unit. 11. Customisation and development of cadastral and registration software. 12. Appoint an Assistant Director or Assistant Surveyor General with interest in PPP to champion the initiative task force). 13. Identify potential partners (private sector Geo-ICT companies) and start discussion with them on the expected benefits and likely roles. 14. Agree on the tasks or responsibilities and resource commitments of each partner. 15. Implement commitments, monitor and evaluate the partnership process. 16. Keep up-to-date, open and accessible records and documentation of the partnership activities and administration.
SO4: Build on the computer literacy programme of the state government.	
	<p>Actions</p> <ol style="list-style-type: none"> 17. Plan and implement basic computer literacy course for staff. 18. Carry out an advanced computer training programme for relevant staff to include networking, searching, discovery and accessing of remotely located information, data sharing and inter-departmental workflow management.
W-O STRATEGIES	
WO1: Develop clearly defined, well-documented and published mission, vision, goals and action plans	
	<p>Actions</p> <ol style="list-style-type: none"> 19. Define a cadastral and land registration specific mission and vision. 20. Outline goals (<i>with performance measures</i>) based on the vision. Identify strategies and corresponding initiatives.
WO2: Recruit young professionals and encourage teamwork	
	<p>Actions</p> <ol style="list-style-type: none"> 21. Determine personnel requirements for the attainment of the new organisational goals. 22. Match available staff with the requirements, determine gaps, fill the gaps by training of qualified and eager

	<p>staff, and employ young and highly qualified new professionals through an open and competitive procedure.</p> <p>23. Give annual awards and accelerated promotion to outstanding staff members of staff.</p> <p>24. Provide awards for units, survey field parties and sections with high performance in terms of teamwork.</p> <p>25. Team building and setting good examples to subordinates should be one of the important criteria in annual performance evaluation of senior staff.</p>
WO3: Integrate production processes and ensure transparency	
	<p>Actions</p> <p>26. Use one application form for all requests for products and services.</p> <p>27. Publish periodic technical and management articles and reports, with information on procedures, fees and methods of payment.</p> <p>28. Place fees and procedures in conspicuous places for customers and on the Internet.</p> <p>29. Combine cadastral surveying and deeds registration divisions with direct working procedure.</p> <p>30. Establish a customers support and public relations unit; organise users and have periodic users' forum for continuous assessment of their satisfaction and emerging needs.</p> <p>31. Prohibit any form of unofficial payments and 'gifts' from customers.</p> <p>32. Forge a close link with the Independent Corrupt Practices and Other Related Offences Commission (ICPC) and educate staff on the negative effects of bribery and corruption on the organisation, the employee and our future.</p> <p>33. Establish a special taskforce on corruption to work in accordance with the <i>Corrupt Practices and Other Related Offences Act 2000</i>.</p> <p>34. Monitor staff closely and provide stiff penalties for staff found guilty of corrupt malpractices. Prosecute customers and staff that offer and receive bribe in any form.</p>
WO4: Spatial data production based on the requirements of users.	
	<p>Actions</p> <p>35. Speed up completion of the recently awarded contract for the production of base map of Ondo State.</p> <p>36. Digitisation of all state residential and industrial layout plans, private residential layouts, master plans (large scale maps), etc.</p> <p>37. Convert existing 'red copies' of survey plans into digital format and fix a date for mandatory submission of softcopies of survey plans by registered surveyors.</p>
S-T STRATEGIES	
ST1: Gradual shift to a non-profit oriented agency, governed by public law, but funded by market.	
	<p>Actions</p> <p>38. Set up a business development unit that would be managed by professional economists and marketers.</p> <p>39. Develop new products and services.</p> <p>40. Create a comprehensive pricing policy with clear explanation of the cost of products and services.</p> <p>41. Fix cost recovery targets and put them into action with ordered evaluation.</p>
ST2: Utilise intercoms and functional external telephone lines (wireless / mobile)	
	<p>Actions</p> <p>42. Install intercom in all units or divisions.</p> <p>43. Fix a functional wireless telephone in the USC (minimum of four external lines) with automatic switchboard to the C&R and Geo-ICT. Save time with automatic call transfer.</p>
ST3: Develop a less hierarchical organisational arrangement with well-defined responsibilities	
	<p>Actions</p> <p>44. Implement a complete change from functional working units to processes.</p> <p>45. Build up a flat administrative layout with less controls, higher accountability and direct communication channels.</p>
ST4: Regular market surveys and evaluation of customers' satisfaction	
	<p>Actions</p> <p>46. Establish customers' service and public relations unit and ensure effective communication with all groups of customers or users.</p> <p>47. Carry out periodic survey and evaluation of customers' objectives, problems, requirements/needs and</p>

	discover their unknown (hidden or not apparent) concerns. 48. Evaluate products and services competitiveness in the market as <i>if there are other LIService providers</i> .
W-T STRATEGIES	
WT1: Create a semi-autonomous bureau with sole responsibility of cadastral and land registration	
	Actions 49. Attain 100% cost recovery status. 50. Educate the employees and public on the need to become a self-sustaining public agency in view of the increasing budget cuts. 51. Seek government approval to become a semi-autonomous agency for cadastral and land registration services. Plan and provide justifications.
WT2: Re-engineer production systems (technology and processes) and training.	
	Actions 52. From the users' requirements survey, analyse and determine: hardware, software, updating, maintenance and training requirements for improvement. 53. Draw and implement long and short training programmes for qualified and zealous staff. 54. Produce a computer network diagram; network all computers with internet connections. 55. Link to http://www.ondostategovernment.com/ to provide information and application form to customers. 56. Change workflows to accommodate the new system and the LRCI architecture. Introduce Work Flow Management System (WFMS) and good Time Registration (TR) of processes. 57. Establish and maintain a trust-based and thorough in-house culture in which bribery is forbidding. 58. Carry out regular general staff and management meeting to bridge the gap between management and the other employees.

Table 3-7 Strategies and actions for improvement

3.8.5. Proposed system

A new model is designed with a view to improve the present situation. It is a customer focussed model, tested with users and stakeholders in the study area. An example of the validation process during the fieldwork is in appendix 13. Any natural or non-natural person that has transactions connected with land registration and cadastral services in the MWLH is referred to as a customer in the proposed model. A customer in the model is a client or consumer that pays for services or goods. Customers make some commitments on their side, in cash or kind (e.g. time), the financial commitments are made with some intentions, whatever their intention is, the customers want the best value for their money and seek for better products and services at cheaper prices. There are however different levels or categories of customers. For the purpose of this research, the following types or classes of customers were distinguished.

- Regular users: Public or private organisations utilising the products and services of land registration and cadastral in their daily activities. These products and services serve as 'raw materials' for the production processes of this category of customers. They include utility companies, private firm of Land Surveyors, Architects, Town Planners, Lawyers, Real Estate Agents, Tax Consultants, financial institutions like banks and insurance companies.
- Ad hoc users: These are impromptu or 'once in a while' customers. They are citizens / individuals and organisations (public and private) that make use of the products and services of cadastral and land registration occasionally or infrequently.

Under the new model, the customer as in the present situation will arrange for the survey of the land with a RS and presents the survey plan to initiate the process of granting a statutory right. The customer may be the potential land occupier, an agent or representative. The customer presents the

survey plan approved by the SG to a proposed **Unified Service Centre (USC)**. The USC is the first point of contact for all customers. The responsibilities of the USC are to:

- efficiently solve problems relating to customers' demands and / or complaints;
- check all documents submitted by customers;
- issue forms to customers on request;
- provide information on all services, products and fees;
- calculate 'all-in-one' fee for processing statutory rights to land;
- receive, acknowledge and document payments;
- communicate and educate customers, and provide advisory services on land registration and cadastral services and
- lead the creation of courteous, friendly, professional work environment and good image or public relations.

The role of the USC in the granting of statutory right of occupancy starts with the issuance of an application form as soon as the customer indicates interest in securing a right of occupancy. It is proposed that the customer signifies his or her intention by presenting a survey plan that is signed, sealed and delivered by a RS. At this moment no fee is paid, the customer will submit the form with the required documents to the USC. The USC will check the entire documents submitted and chart the survey plan. If the result of the charting is satisfactory, then an 'all-in-one' fee for processing the statutory right to land would be calculated. This approach⁶ will erase the existing situation whereby applicants have to go to the bank up to five times for payments, prevent multiple registrations of one parcel and also serve as a form of quality control. The customer pays the fee once and the processing is initiated, by sending all documents (including survey plan) to the C&R. The next step will be a field verification exercise in form of site inspection. But, field verification will take place under two circumstances: when master plan or base map used for charting is considered insufficient or when there are uncertainties that could only be cleared in the field. If the outcome of the field verification exercise is not okay, the survey plan will be sent to the USC for the information of the customer, with suggestions for correction / amendment / modification or re-survey. If inspection is not required or outcome is considered sufficient, the survey plan would be sent for the approval of the SG.

As in the current procedure, the application will be sent for publication. The implementation of the LUA makes it mandatory to publish an application for statutory right in a daily newspaper to ask from the general public for any objection to the claim or request. The publication must contain a description of the land and name of the person (natural or non-natural) seeking the right. After 21 days, if there is no objection to the request, the deed documents will be prepared, otherwise, the USC would be informed and a letter giving details of the objection will be sent to the customer. A published application without any objection will be sent for stamp duty. Stamp duty is a state government tax which is payable when a property is transferred. It is calculated on the estimated worth (value) of the land and normally paid by the buyer as a tax on legal documentation. The stamps on the legal documents such as deeds certify payment. When the stamp duty is made, the deed is sent for the approval of the State Governor. In Ondo State, the approval is delegated to the Honourable Commissioner of the MWLH. As soon as the C. of O. is approved by the Honourable Commissioner, the certificate will be sent to the USC for delivery to the customer.

⁶ all-in-one fee and payment

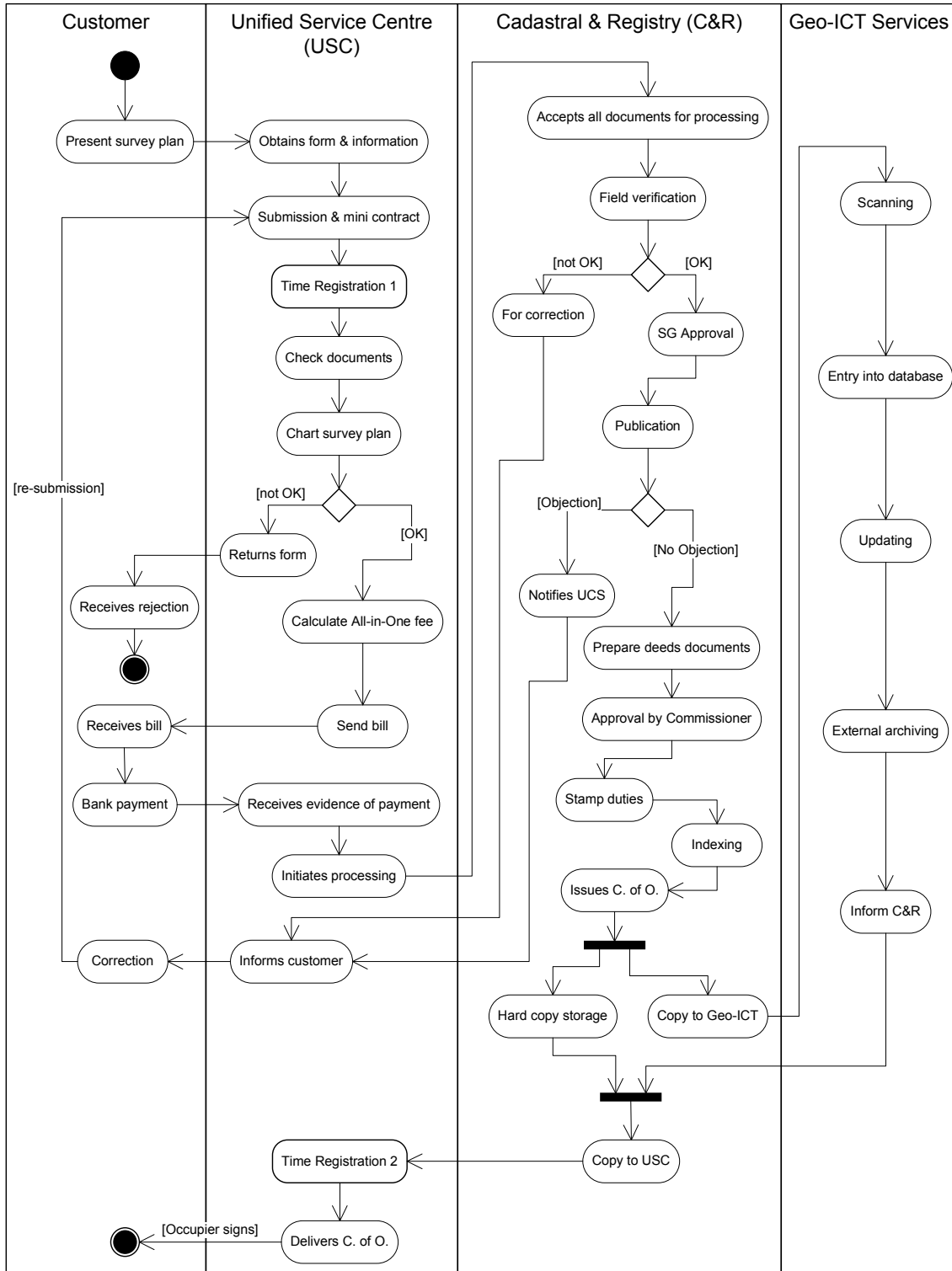


Figure 3-13 Validated model for improvement

The important aspect of the proposed model that would improve the availability of land registration and cadastral information will commence with an indexing. Indexing will involve the documentation of all information relating to statutory right, e.g. name of the owner, date of birth, gender, marital status, next of kin, history of property, size, etc. This will be realised using the model proposed in figure 4.8. One original and two copies of the C. of O. will be produced, one copy to the customer, a

copy will be stored in-house in a fire-proof and well secured safe. The third copy will be stored externally in different organisation on agreement.

A Geo-ICT Services unit is proposed in figure 3.13. A realistic solution is to administer the unit under a genuine PPP arrangement. In this case, the MWLH will have an agreement with a privately owned organisation to run Geo-ICT services. The services will be delivered purely on a commercial and profit-oriented basis and similar services may be delivered to other organisations for a fee. The privately owned corporation must show clear and outstanding Geo-ICT capabilities, based on certification. The entry into the database by the Geo-ICT unit will include scanning of all documents or certificates delivered to customers. Immediately a C. of O. is sent to the USC, all information about the statutory right granted should be entered into the database with the scanned documents within a specified period of time.

The model in figure 3.13 brings a single window solution through the USC for the availability of land registration and cadastral information in Ondo State, Nigeria. The USC would have direct access to a mirror database of the C&R for requested services or information. Thus, the USC would be able to offer quick or timely services to the customers. Customers requesting for services such as:

- consents (alienation of the right of occupancy or any part thereof by sale, mortgage, transfer of possession, sublease, etc);
- confirmations of the rights of occupancy; and so on, will contact the USC.

Time registrations are included in the model to allow the recording of the processing time. Time Registration 1 represents the beginning of processing and Time Registration 2 marks the end of the processing.

3.9. Concluding remarks

This chapter has basically presented the position of LIServices in the study area as derived from fieldwork carried out in October/November 2004. Preparations were made before the fieldwork and fitting decisions were taken on: the data to collect, where and how to collect them and the analysis techniques. The analysis actually started in the field with the testing of the initials models developed before the fieldwork with the users and stakeholders. The models were tested during interviews and observations of the technology and processes at work. Suggestions and comments gathered on the integrated SWOT analysis were used for its upgrading in the field. Nevertheless, the workshop provided a rare and unique opportunity for interactive validations with a larger audience. It is not an exaggeration or over-statement to state that, though workshops are expensive to organise and requires a lot of resources, it may be judged as the most effective single tool used for data collection and models testing in the research. However, it should never be used as a sole method of data collection for any research, especially in the LDCs. A national strike was proposed to commence on the date of the workshop, but the Labour Congress called off the strike about 12 hours to the commencement of the workshop. Structured interviews, informal discussions and observations as techniques for data collection in the study area also met the data requirements of the research. About 60% of the questionnaires sent out were recovered with persistent follow-ups, explanations of questions and personal administration of questionnaires to the ad hoc users. All relevant evidences were used in a corroborative manner with simple quantitative analysis to provide the desired input for the development of the LRCI.

4. Land registration and cadastral infrastructure

4.1. Introduction

Attempts have been made in the preceding chapters to look at the key issues surrounding the provision of LIServices in Nigeria, with in-depth capture of the situation in the study area through a fieldwork and analysis of data to provide the foundation for this chapter. The issue of paramount concern in this chapter is the design and implementation of the level single-window solution validated with users and stakeholders. Infrastructure exists to serve specific functions; inherently the functions that an infrastructure would serve must be clearly identified before design, building and testing of the infrastructure. The basic structure or an example of the infrastructure that would be placed in the MWLH to provide single-window access to improve LIServices is modelled to reflect the informational requirements. Considering the level of complexity that the single window solution should address at the moment, an example was implemented with a combination of software. Other implementation possibilities and alternative solutions for spatial data acquisition were also discussed. Issues related to funding and the guidelines for implementation of the infrastructure are presented chapters five and six.

4.2. Level of single window access

The facts analysed and presented in the third chapter reveals hidden but vital features that point to the level of complexity that the infrastructure should address. These are:

- users' want to have access to land and property related information in both analogue and digital forms;
- the users' need survey plans, deeds documents, history of properties, ownership and land use information;
- users' desire faster services, but at the moment, they are not interested in e-LIServices;
- the MWLH is working towards a digital production line, but considered electronic services as a thing that should be reserved for the future;
- MWLH is the core producer with statutory responsibility for cadastral and land registration services;
- LIService is not the primary function of the other producer (OSDPC), indicating that the other producer may indisputably be a regular user;
- poor storage conditions of important information, any disaster like fire will mean a complete loss of information currently held and
- users' want a transparent system and are willing to pay more for better services.

Considering these characteristics, the feasible single-window solution is an expandable and manageable system that combines the scattered and unnoticed information into a single arrangement

that will facilitate external and intra-organisational access through a common gateway referred to as a USC in the validated model for improvement in figure 3.13.

4.3. Specifications

Specifications are descriptions of what the proposed system will accomplish and how it will perform the functions. These are functional specifications for internal single-window access within the MWLH to facilitate ease of use of land and property-related information, with limited online possibilities as part of the infrastructure's inbuilt functions for transparency, customers care and a step into the future. Although the example in this research was realised mainly in ArcGIS, software brand or vendor is not the core of the LRCI, rather the specifications in table 4.1 were prepared with the intention of giving the vendors a clear idea of what the LRCI wants to achieve immediately and in future. Functional specifications do not tie organisations down to a specific product: hardware or software, but may help vendors to make better decisions on which products to suggest.

No.	Description of specification
1	Basic functions: <ul style="list-style-type: none"> (i.) Support storage and management of maps, documents, digits and other (attributes) data. (ii.) Allow simultaneous use by many users within MWLH. (iii.) Security and protection: network, information, unauthorised use, levels of access permission, ID and passwords (authentication of users). (iv.) Industry standards, scalability, nominal client support requirements and ease of maintenance. (v.) Ease and transparency of use with functions that could be used by non-system or non-Geo-ICT personnel. (vi.) Can be easily enlarged and easy to handle or use.
2	Hardware: <ul style="list-style-type: none"> (i.) Fully networked personal computers (PCs), servers, digitisers and/or scanners, printers, etc. Intranet functionalities customised for administrative and accounting functions. (ii.) Locally assembled Pentium-based PCs with processors that can execute up to 6 instructions simultaneously and the possibility of faster execution of certain instructions if necessary.
3	Software: <ul style="list-style-type: none"> (i.) Built on proven technology platforms. (ii.) Support spatial analysis, tax assessment (<i>stamp duties, capital gain tax, etc</i>) and property valuation. (iii.) Handles field survey measurement. (iv.) Support workflow management to ensure that important steps such as charting and publication are not by-passed and conformation with legal requirements. (v.) Communication with other programs. (vi.) Customisable (<i>e.g. for automatic time registration of processes</i>) with software development kit.
4	Database: <ul style="list-style-type: none"> (i.) Well-defined model for working with data. (ii.) Allows storage of cadastral survey data, non-spatial data, historical records and documentation, metadata and quality description. (iii.) Ability to store large continuous map layers in a single database.
5	Training⁷: <ul style="list-style-type: none"> (i.) Awareness and motivation workshop before the commencement of operation. (ii.) In-house training on all equipment (hardware, software, others) purchased. Training must be incorporated in all procurements. (iii.) Specific training on management of corporate cadastre dataset and content management.
6	Maintenance: <ul style="list-style-type: none"> (i.) Post delivery services. (ii.) Availability of certified field service Engineers.

⁷ Long term training programmes are excluded.

7	<p>Network design:</p> <ul style="list-style-type: none"> (i.) Plan and document the network (with diagrams and responsibilities). Provide a network handbook. (ii.) Traffic prioritisation and policy-based distribution. (iii.) Reduction of the adverse effects of a hardware failure – <i>data backup hardware and software.</i> (iv.) Support of multi-user databases. (v.) Connection to one external server.
8	<p>Office environment:</p> <ul style="list-style-type: none"> (i.) Reception desk, first point of contact in the USC. (ii.) Information board: for prices / costs of services and products, newsletter, etc (openness / transparency).
9	<p>Communication channels:</p> <ul style="list-style-type: none"> (i.) Desk to desk (d2d) intercom connection. (ii.) Central telephone service with automatic switching service to the d2d intercoms. (iii.) Email, fax and conventional postal services. (iv.) Internet (limited to information e.g. fees, application forms, procedures, where and how to pay and customer complaints). (v.) Make customers' complaint systems easily accessible.
10	<p>Others:</p> <ul style="list-style-type: none"> (i.) Electric generator. (ii.) Correct electrical loads, wiring practices, power quality, existing power protection equipment and environmental conditions. (iii.) Uninterrupted Power Supply (UPS) with automatic voltage regulation; surge, spike and lightning protection port; fax / modem / telephone protection port.

Table 4-1 Functional specifications for Ondo State Land Registration and Cadastral Infrastructure

4.4. Architecture of the infrastructure

Section 1 (1) of the LUA clearly puts the administration of land in Nigeria as a job for states' governments, thus states are responsible for the allocation of land in all urban areas to individuals resident in the state and to organisations for residential, agricultural, commercial and other purposes while similar powers with respect to non-urban areas are conferred on Local Governments as earlier mentioned in section 2.2.1.

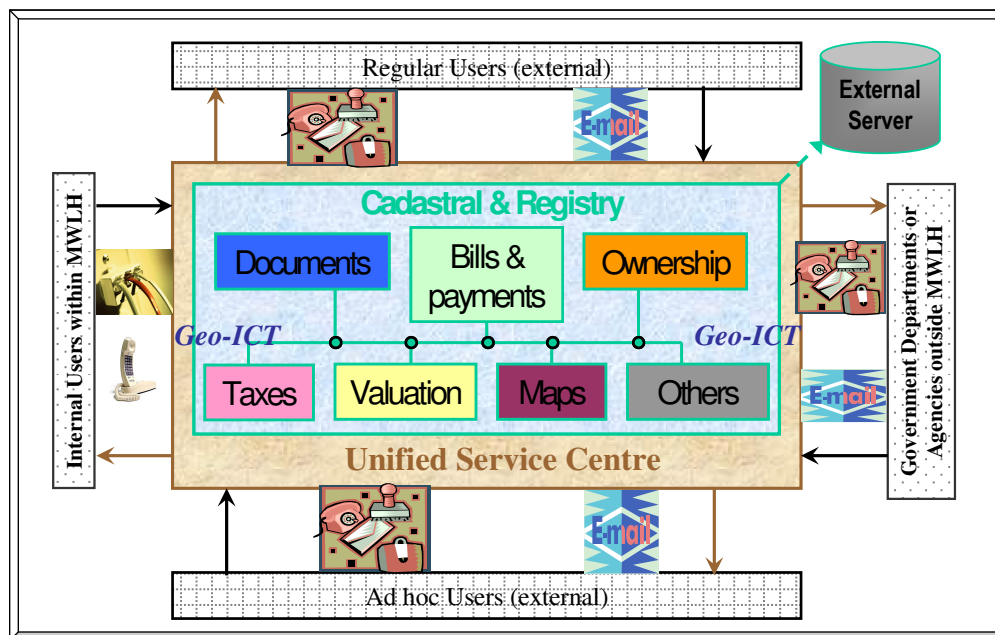


Figure 4-1 Adaptable and scalable architecture of the LRCI

The architecture illustrated in figure 4.1 describes the structure and interactions of the proposed system to provide one-stop solution for different categories of users and indeed all citizens living within and outside Ondo State, with the future possibility of extending it to all property investors, regardless of their location at any point in time.

The basis of the infrastructure as portrayed in figure 4.2 is spatial data (maps) and Geo-ICT. The apparatus of the Cadastral and Registry (C&R) module must be related together through unique identifiers. The Unified Service Centre (USC) is the first point of contact and one-stop shop for all users or customers. Ad hoc and regular users are outside the MWLH, it is designed that they would be able to contact the USC for information, services and products through telephone, fax, post, in-person and email. These channels of communication are also proposed for government departments or agencies outside the MWLH, while other departments such as town planning, public building, civil engineering, etc (internal users within MWLH) could use telephone and the intranet or local network proposed for the organisation.

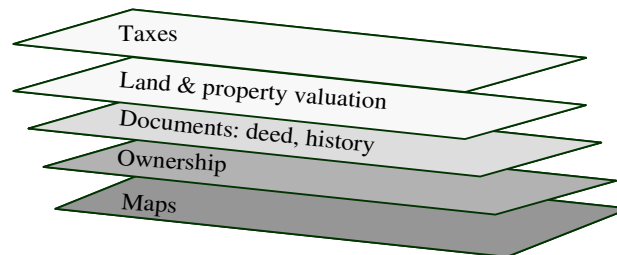


Figure 4-2 Information requirement grouped in five layers

The USC would have access a 'mirror' or duplicate servers of the C&R as represented in figure 4.3. The servers would be updated at the end of each working day, with routine back-up in an external server that would be located outside the MWLH as designed in figure 4.1.

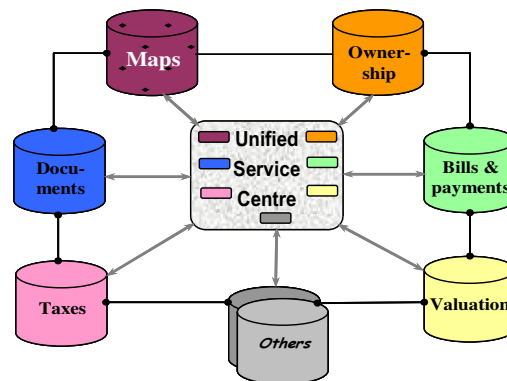


Figure 4-3 Direct contact from USC to mirror databases of the C&R

4.4.1. Maps

These are large scale cadastral maps and survey plans with identified coordinates on a geometric grid to define the parcel location in space. A base map covering the state is also required in the proposed system. In consequence, there are 2 important considerations: national spatial reference framework and the geoid. Attention is given to these considerations under geodetic control network and spatial data acquisition in section 6.4.7. An approved survey plan will be entered into the system with a unique numeric identifier and information such as the name of the registered surveyor, date of approval and registration status in the deeds registry. A parcel identifier links the maps with the documents and survey plans as presented in figure 4.4.

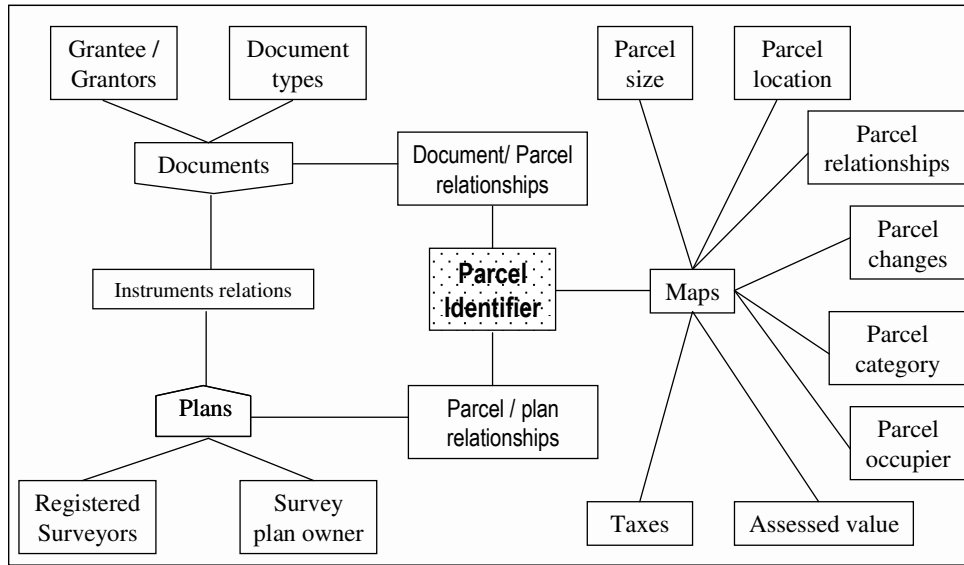


Figure 4-4 Parcel identifier – unique correlation of the proposed system

Adapted from CARIS (2004)

4.4.2. Ownership

Ownership here refers to right of occupation (legal and just claim with respect to the LUA) rather than right of possession. Ownership information will contain information about the occupier. From the users' requirements survey, such information would include: name, occupation, gender, marital status, and next of kin.

4.4.3. Documents

These are written accounts (instrument) of ownership or obligation in form of a deed, mortgage or lease. All documents entered into the C&R module would be given a unique numeric identifier and classified appropriately. All the information on the register, PRK and PC in the deeds registry would be merged here. Examples of such information are: file number, grantor and grantee, lessor and lessee, mortgagor and mortgagee, date of approval of C. of O. date of registration, survey plan number, payment information, (e.g. receipt number) and other registration particulars.

4.4.4. Valuation

This is an appraisal of the value of a parcel and developments on the parcel at a given point in time. The category of the parcel (urban or rural), zip code and the date of assessment are important information for valuation. The valuation is necessary for assignment, mortgage, transfer of possession, sublease, etc. The LUA prohibits the alienation⁸ of statutory right of occupancy without the consent of the State Governor.

4.4.5. Taxes

The taxes such as property tax, capital gain tax, and stamp duties are normally based on the assessed value of the parcel (including the developments – property). The information will include: tax code or

⁸ Voluntary and absolute transfer of title and possession of real property from one person to another. The power of alienation is an essential ingredient of ownership.

tax key numbers, exemption status (e.g. state property may be exempted), assessed value, postal address for tax bill and deadlines for annual property tax.

4.4.6. Bills and payment

This is an inbuilt control mechanism to check and record payments. The unit responsible for bills and payment will develop pricing policies, fix prices and advise the USC on all financial matters. The Bills and Payment is proposed to record and check all records relating payments. It will confirm payments and cross-checks the information in the Taxes database.

4.5. Modelling cadastral features and registration objects

The basis of every land administration system is the relationship between parcels and persons (Molen and Lemmen, 2004). The relationship as represented in figure 4.5 can be rights or restrictions. The person may be a natural or non-natural person is referred to as an occupier, because the LUA prohibits outright ownership. The term parcel refers to a tract or plot of land; it is typically used in the context of land use or legal ownership (ESRI, 2004a). Land use regulations can define different types of use rights and restrictions, such as single story or many stories building specification for an area, industrial or residential zoning, paths or tracks to parks and green belts, environmental corridors, etc. This consideration can be represented in a land use planning model as shown in figure 4.6.

There are remarkable accomplishments in the modelling of land and property-related objects, processes, or events. A high-level approach for the implementation of the Cadastre 2014 vision using modern GIS software has been clearly defined and well-documented by ESRI and Kaufmann (2004). The Environmental Systems Research Institute (ESRI) has also developed National Cadastre Data Models to provide a generic data model based on the basic principles of the Cadastre 2014 concept. According to ESRI, the facts included in the various models and reports were discussed with a number of cadastral researchers and experts from various countries through workshops and other contacts.

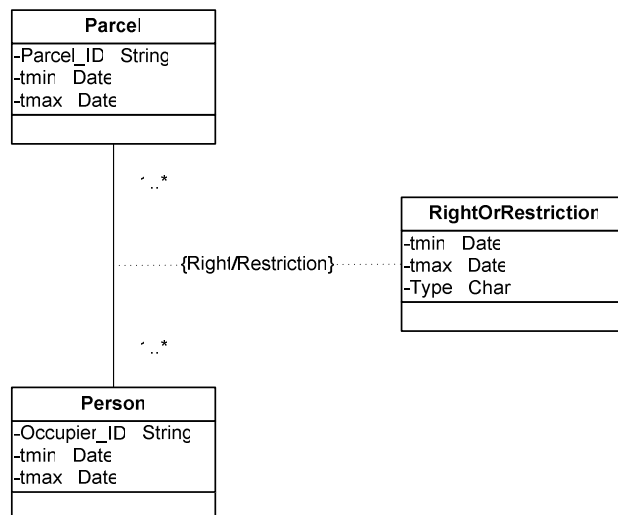


Figure 4-5 Parcel - person relationship

Source: Molen and Lemmen (2004)

The experts include the following among others: Prof. Ir. P. van der Molen (*Chair of FIG commission 7*), Ir. C.H.J. Lemmen, J. Kaufmann and Prof. P. van Oosterom. These consultations offered ESRI an

exceptional or unique opportunity to recognise and analyse various specific requirements and ideas being tested in different countries (ESRI, 2004b). The data models are obtainable from ESRI, thus saving the resources of users in generating new models, especially when using ESRI products. An example of such model is the Land Objects Features model in figure 4.7.

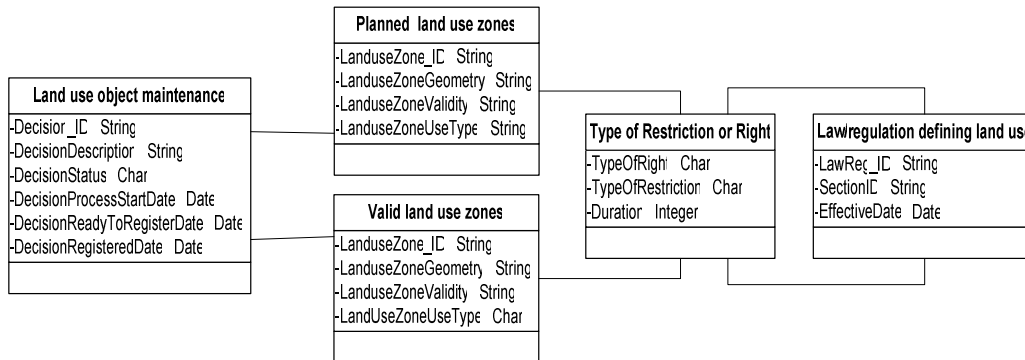


Figure 4-6 Modelling land use policies into LIServices
Adapted from ESRI and Kaufmann (2004)

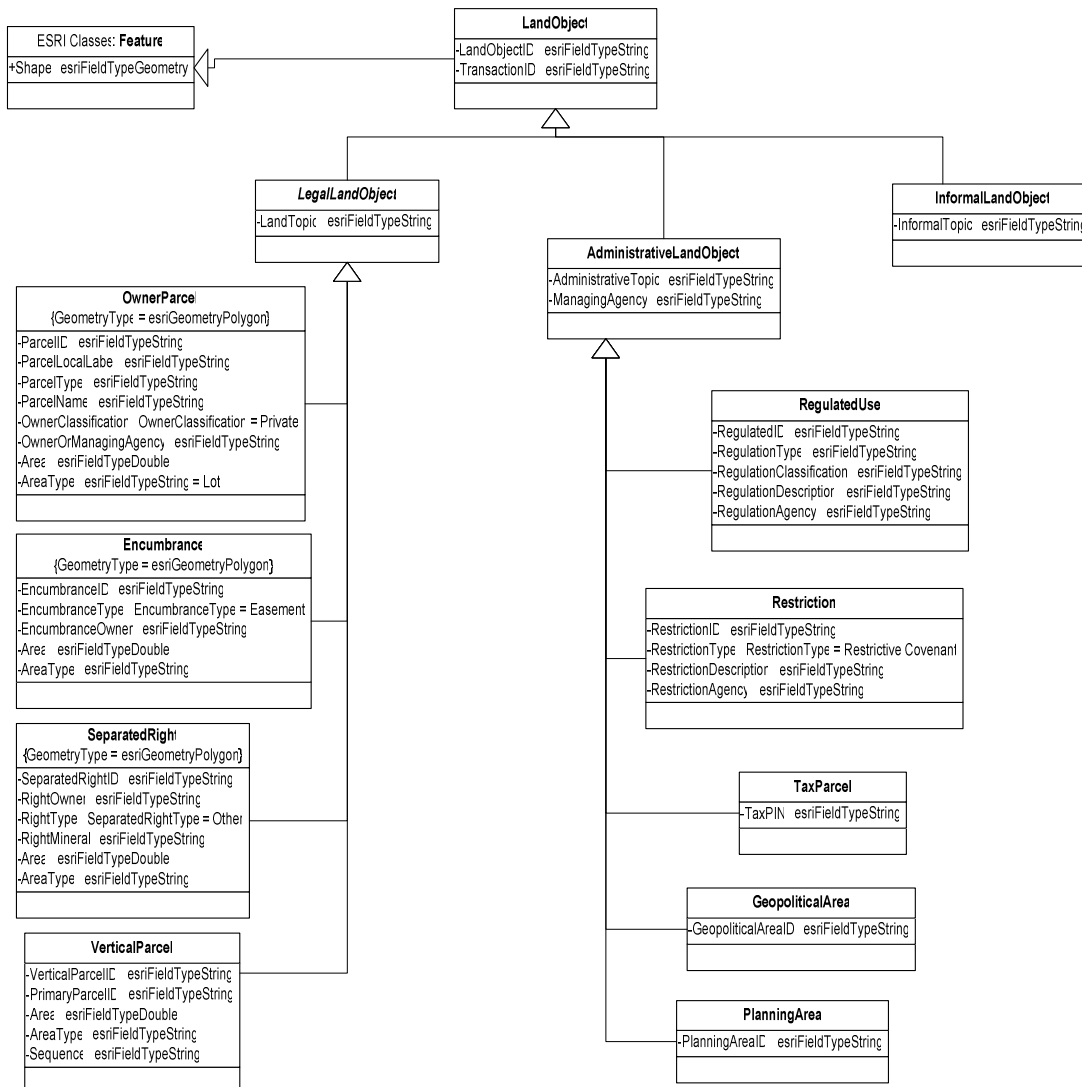


Figure 4-7 Modelling of land object features by ESRI

Models give a simplified description of complex entities or processes as in land administration. The abstraction of the reality as recorded and analysed from fieldwork is presented in figure 4.8 to facilitate the capture, storage and ease of use of the relevant information. The model is simplified and built on the users' requirements to derive new information from input data in accordance with the architecture presented in figure 4.1. The core of the model in figure 4.8 is the parcel, while maps are mandatory for the implementation of the validated model for improvement in figure 3.13. Figure 4.8 shows parcel, feature and object relationship. The documents are important components of the deeds registry; it would be related to text, mortgage, transfers and certificates (images) with unique identifiers, for example, in figure 4.8, the Doc_ID would be a foreign key to the primary key Mortgage_ID in another relation labelled 'Mortgage'. In simple and clear terms, a primary key is a column or set of columns in a database that *uniquely identifies* each record and a foreign key is a column or combination of columns in one table whose values match the primary key in another table. A value in the foreign key can only exist if there is a corresponding value in the primary key, unless the value is NULL. On the other hand, primary key allows no duplicate values and cannot be NULL. Foreign key–primary key relationships define a relational join (ESRI, 2004a).

The Certificate_ID, Mortgage_ID, Transfer_ID and Text_ID are foreign keys in the relation 'Documents' and primary keys in Certificate, Mortgage, Transfer and Text respectively in figure 4.8. The relationship between Documents and Ownership is '*compositional*'. A composition is a form of aggregation that indicates that a part may belong to only one whole and that the lifetime of the whole determines the lifetime of the part (Microsoft, 2004). Documents exist only when there is ownership (occupier), in other words, when there is no Ownership, there is no Document. When there is Document, there must be a Certificate (C. of O. or Deed of Sublease) and when there is a Certificate, there must be a Document, the relationship here is one-to-one (1..1). As shown in the model, when there is a Mortgage, there must be a Document, but a Document may not have a Mortgage. This also holds for Transfers, but when there is a Mortgage, the person who accepts a mortgage, e.g. a bank (mortgagee) can effect transfers, e.g. in the event of bankruptcy or inability of the mortgagor to pay. However, anytime that there is a transfer and/or mortgage, there is a document. Documents may not have a transfer or a mortgage. The relationship between Documents and Text is many-to-many (m..m), many Documents can have many Text and vice versa. The association shape or notation is used to represent the relationship between Document and Text.

The generalisation notation in the model (figure 4.8) generally indicates a relationship between a specific element and a general element, such that the specific element is fully consistent with the general element and includes additional information, e.g. attributes and associations (Microsoft, 2004). For example, Ownership supports all features of *Object*. Ownership implies right in this study, that is a right of occupancy in accordance with the LUA. *Object* does not mean 'spatial object', but it is used with the meaning of 'a thing' or 'an entity'. *Object* is an abstract class that is normally written in italics.

Parcel is the only geographic feature in the model. A parcel must have valuation and taxes, and valuation and taxes are attached to the parcel, hence the Parcel-Valuation relation and Parcel-Taxes relations are one-to-one (1..1). A parcel can be on many survey plans and many parcels could be shown on many survey plans, in consequence the relationship is many-to-many (m..m).

The data model for the LRCI fits the needs of the users. It is expandable, flexible and not-restricted to a particular type of software. However, the software functionalities must include ability to handle text

and scanned images. Document management and/or a content management are crucial for the implementation of the model. The approach is based on the introduction of a simple system, to be followed by a steady movement to a more complex ultimate system (Molen and Lemmen, 2004), for instance as discussed under future requirements and customers expectation in section 5.6.

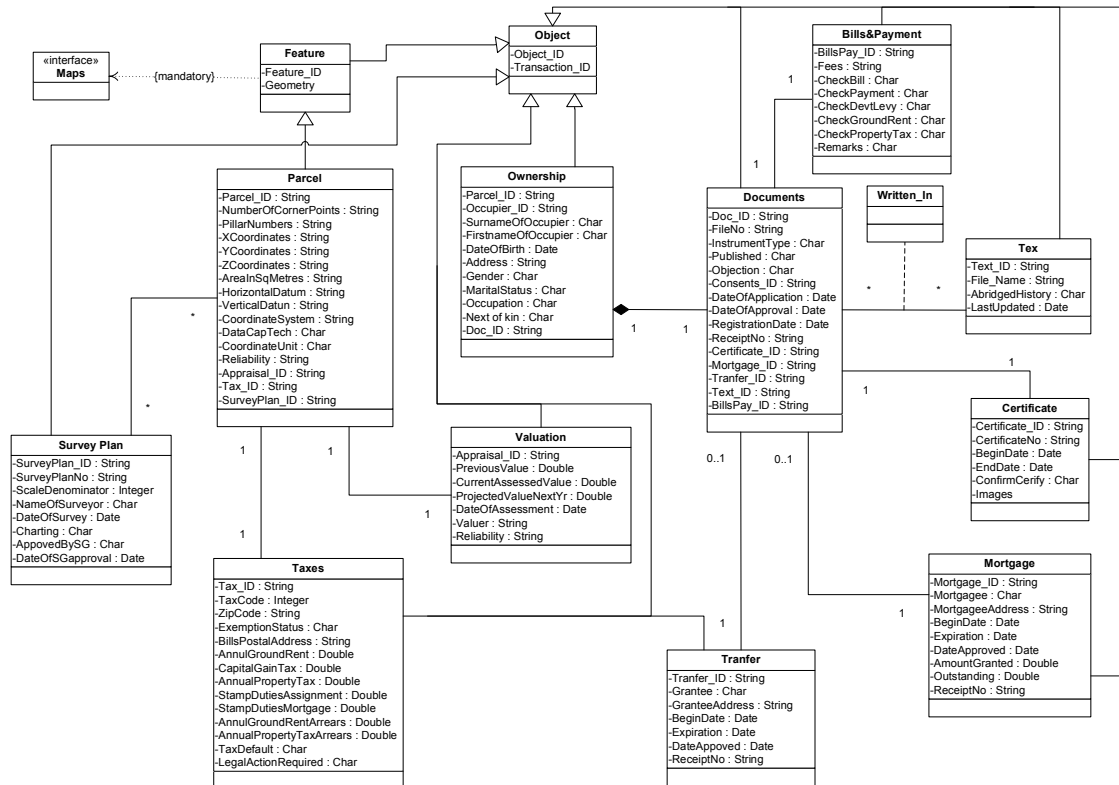


Figure 4-8 Data model for the LRCI

4.6. Implementation / Prototype building

A prototype was created to test the proposed single-window solution within the core provider’s organisation. While, this section summarises the building of the prototype, section 6.2.3 provides details about the testing. Two alternatives were identified for the implementation of the prototype, these are: ‘hybrid’ and ‘en-suite’ solutions. The hybrid approach was adopted in the building of the prototype. The en-suite approach was not implemented, because of unavailability of resources (software), but it is described in section 4.6.2.

4.6.1. Hybrid approach

The hybrid approach entails the use of more than one software. The following software were used: ArcGIS 9.0 from ESRI, Visio 2003 and Access 2003 from Microsoft (MS), Adobe Reader 6.0 and HP Precision Scan Pro 2.03 from Hewlett-Packard Development Company. The hardware is a Pentium-based (P4) personal computer, 1.6 GHz, 500MB memory with 40 GB disk space running on Windows XP (Pro).

The following data collected from the field were converted into digital: Ondo State residential layout (along Benin-Sagamu road, Ore) – Plan No. Ore 8 and attribute information, Certificate of Statutory

Right of Occupancy and ODSHC Deed of Sublease (DSL). A personal geodatabase was created in ArcGIS with a Feature Dataset. A new feature class and tables were created based on the data model for the LRCI in figure 4.8. The data model is not limited to ArcGIS and uses data types that will be easily understandable to users.

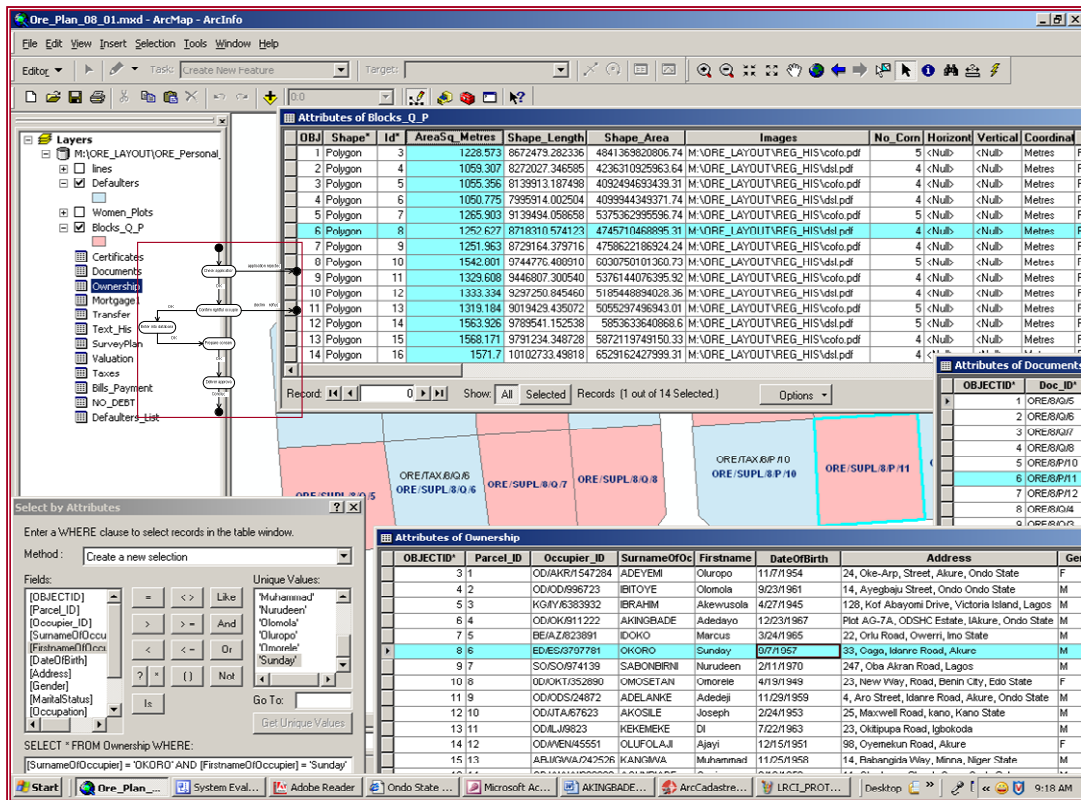


Figure 4-9 Snap shot of an active window of the prototype in ArcGIS

ArcGIS data types differ from the data types specified during the preparation of the models in Unified Modelling Language. ArcGIS data types ‘Text’ and ‘Double’ were used to replace ‘String’ in the original MS Visio model. A ‘Text’ field in ArcGIS can be used to represent a series of alphanumeric data, e.g. name of parcel occupiers, addresses, zip codes or other textual descriptions. An alternative to repeating textual attributes is to establish a coded value. ‘Double’ is numeric data with fractional values within specific range (ESRI, 2005). The tables were associated to each other by defining different relationship classes, with appropriate cardinality (one-to-one or many-to-many) defined for each relationship class. This is based on the modelling of cadastral features and registration objects discussed in section 4.5 and the model in figure 4.8. In ArcGIS, a relationship class is a collection of relationships between objects in two tables or feature classes. One-to-one cardinality was used to relate each object in the origin table to zero or one object of the destination table, while many-to-many was used to relate multiple objects of the origin table to multiple objects in the destination table. For example, a composite relationship exists between ‘Document’ and ‘Ownership’ table. Thus, a cardinality of one-to-one was defined between the two tables with ‘Documents’ as origin and ‘Ownership’ as destination.

Ore cadastral plan No. 8 is the spatial base of the prototype from which the parcels were derived. The certificates of statutory right of occupancy and ODSHC deeds of sublease were scanned page by page

and attached together to derive printable documents (PDF⁹) linked to each parcel. The workflows indicating states, transitions and conditions and use case diagrams used for the testing of the prototype were designed in MS Visio. Accordingly, processes were defined and explained in tables for the testing of the prototype. The snap shot of an active window of the prototype in ArcGIS is shown in figure 4.9.

It is worthy of mentioning that GeoMedia Professional from Intergraph Corporation is an option for the use of ArcGIS in the hybrid approach; it supports the implementation of spatially related databases and allows connections to multiple GIS data warehouses simultaneously (Intergraph, 2004). On the whole, the prototype provides a good point and direction for the implementation of a more complex ultimate system, if necessary.

4.6.2. En-suite approach

This approach involves the use of integrated or single software that provides the functionalities of all the software combined under the hybrid approach. Examples of such software are: ArcCadastrre, CARIS Land Information Network (CARIS LIN) and LAND REGISTER.

4.6.2.1. ArcCadastrre

The ArcCadastrre developed by Lantmäteriet (National Land Survey of Sweden) provides an en-suite solution, based on the ArcGIS as shown in figure 4.10. The software supports the handling of data, functions or process definition that supports system regulations in an integrated way. The functions include data capture, computation, drawing and publication of static maps on the Web (Lantmäteriet, 2003). Every task in ArcCadastrre is driven by the Workflow Editor, the workflow engine executes the workflow and allocates resources (people, data and processes), which is typical of a production environment. The workflow engine allows a controlled production environment, which in turn permits the integration of quality control measures. Plotting styles can also be defined in ArcCadastrre for visualisation. The styles relevant for a job can be recalled for visualisation, instead of defining a new style each time one is working. The plotting styles make reference to the classes defined for the style and not the dataset.

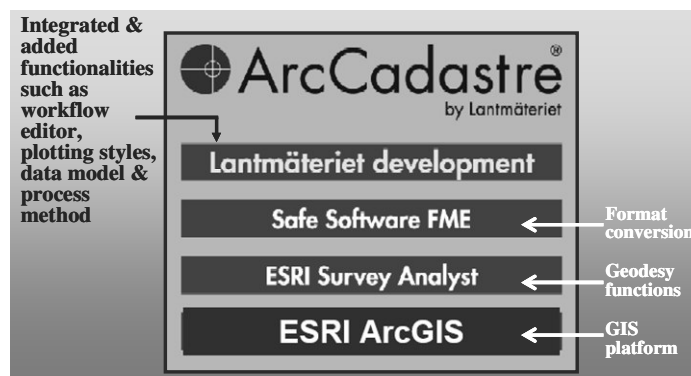


Figure 4-10 Contents of the ArcCadastrre
(Adapted from Lantmäteriet, 2003)

LIServices are provided following a set of conditions, such as legal regulations and securing necessary approvals, with production of documents and correspondences. The ArcCadastrre may be optimised for these processes and also to ensure that users do not miss up the order of a procedure, go

⁹ Adobe Portable Document Format

through all the required procedure and does not take a wrong decision and violate a legal regulation (Morales, 2005). The major limitation of the prototype is that the events in the workflows does not control the job automatically, but has to be followed and executed by an operator, thus requiring good supervision. The ArcCadastre easily solves this problem, but ArcCadastre was not running in ITC at the time of building the prototype. The ITC network is installed with ArcGIS 9, but ArcCadastre 1.1 runs on ArcGIS 8.3.

It is worthy of note that the ArcCadastre is distributed separately and comes with the inbuilt ArcGIS. If one buys ArcCadastre one would have ArcGIS functions and not the other way round. But, I think that the future may be to sell ArcCadastre as an extension of ArcGIS.

4.6.2.2. CARIS Land Information Network

CARIS LIN from CARIS-Universal Systems Limited, Canada is a comprehensive land information system; the integration of the software's digital mapping solution with ORACLE database for land attribute data can support effective and efficient provision and ease of use of land and property-related information. The GIS component of CARIS LIN would allow the maintenance and updating of the digital mapping data required for the mandatory charting of survey plans in figure 3.11. The database component also provides for the maintenance of textual attribute information, such as ownership, assessment information, land use, charges against the land, and financing (CARIS, 2003).

4.6.2.3. LAND REGISTER

The LAND REGISTER by International Land Systems (ILS) Inc, USA can manage all aspects of the deeds registration from calculation of the all-in-one fee, cashiering, indexing, scanning, microfilm archiving (as in the example from RSA), and customers access in the MWLH. It has a Digital Scanning System (DSS) that runs on Windows NT 2000 and XP for managing a wide variety of document and file types. The DSS is database independent and can work with a variety of relational database management technologies and the information is easily shared with other applications and information systems. ILS '*Land Titles Office*' for deeds recording is GIS enabled and shares information with applications developed for parcel maintenance, permitting, and property assessment. The ILS *Geoviewer* supports on screen digitising and annotation for rapid identification of features from the raster data sets, digitised files can be saved as Windows Metafile (WMF) or Data Exchange File (DXF) with geo-referencing (ILS, 2002).

4.7. Alternative solutions for spatial data acquisition

A major hindrance in the delivery of LIServices is non-availability of spatial data as a result of the high cost usually associated with the acquisition of the data, and lack of attention to spatial data acquisition by governments in many countries. This calls for rapid and less expensive solutions to the collection of geographically referenced information for LIServices. If the creation, maintenance and provision of up-to-date information to the society are the key functions of any cadastral and land registration infrastructure. It follows that, any system that meets the needs of the people or a community would suffice and it does not have to be a uniform or homogeneous coverage for a state or country (as long as there is common framework for the country), because:

- human activities are not uniformly distributed over any geographical region;

- people's desire differs and changes over time and
- the understanding and description of spatial units in rural communities usually conflicts with the 'absolute' definition of parcel by cadastral surveyors.

Alternative solutions have to be based on nationwide standard, which fits within one classification system. The other significant success factor is a metadata to provide information about how, when, where, and by which organisation the data was collected; accuracy of the data; availability and distribution. This would allow users to determine the fitness of the data for use and development of solutions within the limits of the available data. Figure 4.9 sketches a non-conventional approach of using;

- one-point coordinate, that may be obtained from Global Positioning System (GPS);
- multiple corner coordinates from field surveys and
- remotely sensed satellite imageries to generate land parcels polygons.

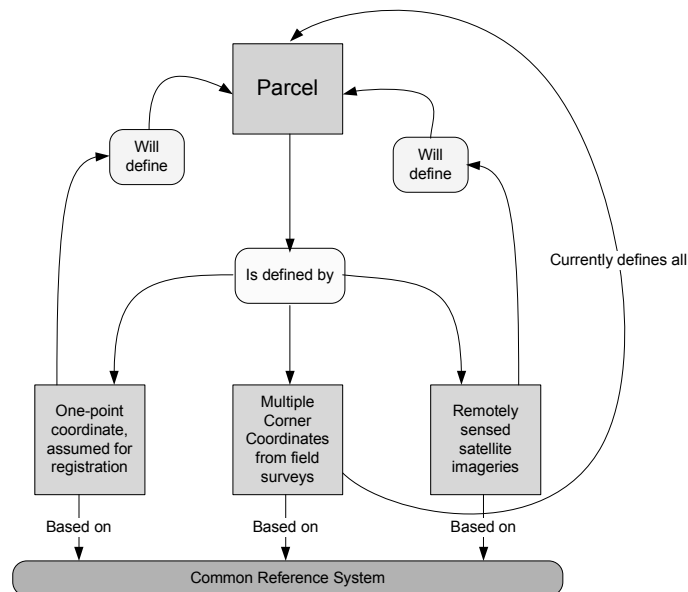


Figure 4-11 Unconventional solution for LRCI spatial data

At present, only multiple corner coordinates from field surveys are used to define parcels within the existing survey regulations, it involves the use of survey pillars or beacons (monuments) shown in appendix 5h. At the International Federation of Surveyors (FIG), Expert Group Meeting held in Nairobi Kenya in November 2004, Prof. Ir. P. van der Molen and Ir. C.H.J. Lemmen recommended an approach based on the establishment of four different forms of representations of objects in a spatial data base. These are:

- Identification of the buildings: building identifier linked with one reference coordinate. The major idea here is that one reference co-ordinate may be sufficient for apartment buildings (e.g. buildings with more than one flat in many stories). Individual apartment or flat will have an *index to the building identifier*.
- Link with object address.
- Rough estimation of parcel boundaries (contours, based on the existing spatial information sets, including satellite images). Depending on the type of imagery, satellite imageries may be more expensive. Less expensive imageries with medium resolution are sufficient for non-

urban lands. This is the major thought behind using remotely sensed satellite imageries in figure 4.11.

- (iv.) Systematic accurate definition of property boundaries based on terrestrial observations. There could be periodic or infrequent cases where accurate boundary definitions are required immediately, e.g. in case of foreign investments, development of real estate projects (Molen and Lemmen, 2004). This is almost certain for land and properties in the state capital, Akure and other major cities like Ikare, Okitipupa, Ondo, Ore and Owo with increasing commercial activities and industrial developments.

4.8. Concluding remarks

This chapter provided the level of single window solution required by the users, it is embodied as an expandable LRCI within the core provider's organisation. The USC is the core of the infrastructure and the one-stop shop for all customers. The USC has a direct access to a mirror database of the C&R; in consequence the USC will meet the quality of being at hand when needed. One of the actions of the strategies in section 3.8.4 (table 3.7) is maintenance. The foothold of the C&R is the Geo-ICT, which would ensure that the infrastructure does not suffer degradation or interruption in its service to the customers as a consequence of failure or breakdown of any of its components. ESRI offers exciting models discussed and validated with distinguished experts, the wheels were not reinvented but the research's specific model is presented which is vendor independent. Other software like ArcCadastre, CARIS LIN and LAND REGISTER could support the LRCI prototyping, but the prototyping or implementation of the single-window access was executed with a combination of software, starting with the building of the geo-databases in ArcGIS. The need to go beyond traditional spatial data acquisition by cadastral surveying of parcels is considered important and was given some attention, because a state coverage based on multiple corner coordinates from field surveys may not be necessary with the present technological solutions and of course not cost effective. Standardisation and metadata provision were identified as important consideration for such unconventional solutions.

5. Land information business

5.1. Introduction

Land Information Business (LIB) is primarily concerned with the efficient and effective use of scarce resources or production factors to create a wide range of timely and high quality products and services. Quality in the modern sense is “*the sum of all production factors that enable ownership satisfaction and bring customers back to buy a product or service again and again*” (Paresi, 2003). Therefore in LIB, LIService producers have to determine what products and services are required now and in the future (present and future needs of the customers), where are the products and services required (home, shops, office/ place of work, on the street, etc) and what manner they could be best produced to meet these requisites. These are the business considerations that have to be considered in relation to availability of money to finance the business especially at its initial or take off stage and in the case of this study, financing the reengineering of the production systems (technology and processes) and training.

In view of the above, the objective of this chapter is to give the LIService provider enhanced capability, more autonomy and discretion in providing quality services. But, more autonomy requires more performance-based accountability on the part of service providers, which may difficult to create under a full civic driven market orientation illustrated in figure 2.2 and described in section 2.3.2. On the other hand, the customers have to take cognisance of the fact that paying for services bestows power and increases the transparency and accountability of LIService providers to the customers. LIB blossoms in a ‘free’ market with government role limited mainly to the establishment of a legal and institutional framework. The current tactics embraced many Nigerians in the use of land and properties as a means of investment gain and as a protection against inflation under the nation’s increasing conditions of economic instability, points to the importance of land in poverty alleviation, capital development and commerce.

5.2. Raising revevue from land

Land and property taxation has a long history as a source of income for the state. They are compulsory payment to a government to raise revenue for the provision of services and infrastructure to the citizens. Dale and McLaughlin (1998) identified two different methods of raising revenue from land, these are:

- Property rating system: In this approach, government earnings come from the assessment and subsequent taxing of improvements on land. Such improvements include building and the use to which a land is put. Accordingly, buildings used for residential, hotel, supermarket or shopping complex would attract different taxes.
- Land value taxation: This is a method of raising revenue by taxing the land itself, either in its developed or unimproved status (Dale and McLaughlin, 1988).

The major forms of land and property taxation in Ondo State are Capital Gain Tax, Stamp Duties and Ground Rent. Capital Gain Tax is a tax on the profit resulting from the transfer or exchange of a land or landed property, while Stamp Duties are charges on land documents and transactions, based on the type and value of the transaction. Ground rent is a mandatory amount usually specified on the C. of O. (subject to review by the Governor) paid by the occupier on annual basis. Land occupiers rarely pay the ground rent which is a kind of land value taxation. There is no direct and fast access to a comprehensive list of the defaulters and some occupiers have defaulted for more that 10 years. The model in figure 4.8 and the LRCI architecture provides a direct solution for determining defaulters, contacting them to pay and making appropriate legal recommendations in accordance with the LUA. This is very important because it is an indispensable funding solution for the infrastructure.

5.3. Funding and maitenance of the LRCI

The transition from the current situation to the proposed situation and maintenance after transition requires a lot of financial commitments for the operation and sustainability of the infrastructure. Five complementary or harmonising options identified for the support of the LRCI are described in figure 5.1 and table 5.1.

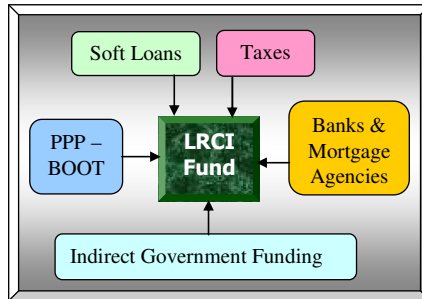


Figure 5-1 Five harmonising LRCI funding options

No.	Option	Description
1	Taxes	Land and property taxation are potentially an attractive means of financing the LRCI. The infrastructure would obviously enhance government income and setting aside a specified percentage of the tax earnings would facilitate the operation and maintenance of the LRCI. Subsequently, the LRCI would be an established source of internally generated revenue for the state government.
2	Banks and Mortgage Agencies	Landed properties are one of the collaterals required by insurance companies, banks and other financial institutions for performance bond certificates and mortgages. These agencies want quick and uninterrupted access to land and property related information, which the LRCI could offer. They are likely to be willing to finance or at least support projects that would make the required information available for their use.
3	Indirect Government Funding	A national infrastructure can be described as a collection of facilities, services and equipment serving a particular country as a whole. Such infrastructure may include factories, roads, electricity, schools, etc. They are integral part of a 'nations system' and exist to serve specific purposes and if they do not exist or cannot be maintained, the country is likely to be in problem or chaos (Akingbade and Lemmen, 2004). In view of the socio-economic benefits of the LRCI to the state and citizens, in terms of provision of information for planning and development, enhancement of land and property taxation, promotion of investments and capital development (especially for small scale entrepreneurs) etc, federal and state governments can support the LRCI by providing equipment or infrastructure and grants to facilitate its initial take-off.

4	PPP – BOOT	This is a Private Public Partnership accord of Build, Own, Operate and Transfer described in table 2.5. Under this arrangement, an agreement would be reached with private sector organisations to develop a specified part of the infrastructure or build the required technical capacity which may be lacking in the public sector, run the services to recover its investment and later transfer the service (whole or part) to the state.
5	Soft Loans	Low interest or interest free loans may be sought for the initial take-off of the LRCI. Agreements may be made with insurance companies holding pension funds, e.g. the National Social Security Insurance Trust, commercial and merchant banks, agricultural and cooperative banks, federal mortgage bank, etc. The rebuilding of the burnt Erekesan Market in the Akure, the capital city of Ondo State under an agreement between the State Government and Omega Bank Plc points to the fact that PPP and soft loans are open sources of funding public services and infrastructure. Government may also give soft loans that would be subsequently recovered from the monthly or quarterly allocation to the MWLH before it goes into 100% full cost recovery.

Table 5-1 Explanation of the funding alternatives

5.4. Cost of products and service and willingness to pay

There is a need to have an unambiguous and transparent pricing policy in a customer focussed LIB. The advantages of clear and understandable pricing policy are:

- a major source of confidence for the customers;
- enhancement of customers loyalty and recommendation to others and
- an unrivalled motivation to pay for products and services.

The results presented in figures 3.7 and 3.8 shows that both regular and ad hoc users are willing to pay more for improved services. But, how much they are willing to pay is not clear. Follow-up interviews and discussions with the users revealed that the ad hoc users are willing to pay as much as twice the present fees, while the regular users are of the opinion that they want to see the level of improvement before they can talk of the exact percentage, but in any case, they will not like to pay more than 20% of what they are currently paying.

The ultimate would be to have a semi-autonomous public agency with full cost recovery for LIServices. This is an uncommon status in Nigeria, but it is the imminent position for GI / LI organisations. The initial problem in this step would be policy and legal framework. Nigeria has no clear policy on payment for spatially related and government information. An objective of the NPIT is to create an easy and free access to government information (section 1.1.2). This may not be realistic under the present economic situation of the country, though there is a similar policy in the USA that allows the distribution of spatial data at the cost of production, at least at the federal level. In this case, all geographically referenced information and their associated attributes are seen a public good, and are treated as a national resource and made available to all users at the smallest amount. The basis of the pricing policy in the USA is its expected positive effect on the development and potency of industrial, commercial, and service sectors of the country. But, the policy creates little incentive for agencies creating these data to evaluate the broader need for the data, or to reduce cost through sharing, despite the importance of sharing as an underlying principle of NGDI (NRC, 1994).

An alternative is to provide incentives through the market mechanism and enhancement of the underlying infrastructure for the provision of such goods and services. The situation in the UK is

perhaps the opposite of the USA policy. In UK, the pricing policy may be seen in relation to the country's copyright law, because there is no specific policy on GI pricing in UK, but the Ordnance Survey (OS) data is protected by virtue of the 1988 Copyright, Designs and Patents Act. The data is protected for 50 years from the end of the year in which the map was published. For example, a spatial data released in 1950 would have gone out of copyright on December 31 2000. Under the 1998 Act, an author has a right to be identified, and any reproduction of an OS spatial data (even out of copyright) should state the OS authorship, the scale, the sheet number and the edition (OS, 2004). The England and Wales Land Registry (www.landreg.gov.uk) provides land registration service for a fee. This should be the position of LIService producers for sustainable delivery of products and services and to guarantee the quality of being at hand when needed.

5.5. Resurgence of 'dead' capital and poverty alleviation

Hernando De Soto's book – *“The mystery of capital: why capitalism triumphs in the West and fails everywhere else”* is the major motivation and resource for writing this section, as it provides a clue towards building a better Nigeria through property formalisation. This was attended to in this thesis as single-window access for ease of use of land and property-related information, implemented within the context of a LRCI. From a block to block and farm by farm survey, De Soto has shown that most of the poor in Asia, Africa, the Middle East and the Latin America possess the assets they need for capital development. For example, in Egypt, the wealth that the poor have accumulated is worth 55 times as sum of all direct foreign investment ever recorded in the country. These wealth are not able to improve the quality of life of people in these countries because they are held in non-functional modes: *“houses built on land whose ownership rights are not adequately recorded, unincorporated businesses with undefined liability, industries located where financiers and investors cannot see them. Because the rights of these possessions are not adequately documented, these assets cannot readily be turned into capital, cannot be traded outside the narrow local circles where people know and trust each other, cannot be used as a collateral for a loan, and cannot be used as a share against an investment”* (Soto, 2000).

If property ownership rights are properly recorded, transparent and available for use at the time of need, these dead capitals would be resuscitated and turnaround to improve the financial capability of the citizens and bring unprecedented social and economic improvements. This important issue has to be clearly noted by the political leadership. The starting point of the Ondo State accelerated poverty alleviation programme (<http://www.ondostategovernment.com/poverty.html>) is to *“teach the poor how to fish”* by making sure that their unregistered properties are well documented, appraised and available to financial institutions to support their use as a share against investment. Of course, this cannot happen without the reengineering of the production system of land and property-related information and enabling legislation. The situation whereby citizens have to wait for one year to get a C. of O. diminishes the property market and lead to decline in investments.

Many people in Ondo State raise capital from 'esusu' or 'ajo'. Esusu or ajo is a form of daily, weekly, monthly or annual contribution into which members make payments and gets their contributions on a rotational basis, or one after the other. Up to three out of every four citizens belongs to one kind of ajo or the other. The members of these organisations are civil servants, traders, farmers, commercial vehicle drivers and street hawkers of petty goods. Some of these unregistered organisations have landed properties that that are not recorded or well documented, they give loans to members on

personal recognition and guarantee by members. The lot of these citizens may be bettered by providing a state infrastructure that would facilitate the registration of their huge but largely unrecognised investments to create wealth and jobs for them. The truth is that most of the citizen's resources are commercially and financially invisible. Their potential assets have not been identified and realised; there is little accessible capital and the exchange economy is inhibited and worsening. A landed property whose economic and social aspects are not recorded in a formal property system is really hard to move in the market to promote investments (Soto, 2000).

Four of the important remarks in De Soto's conclusion that the society cannot afford to ignore and very pertinent in the planning and running of poverty alleviation programmes are that:

- situation and potential of the poor need to be better documented;
- all the people are capable of saving;
- what the poor are missing are the legally integrated property systems that can convert their work and savings into capital and
- considering these there points, the poor are not the problem but the solution.

5.6. Future requirements in LIB, customers' expectations and solutions

A way of looking at future requirements of the customers in LIB is to compare the rate of improvements in Geo-ICT with customers' expectations, model and predict their expectations for the future. Technology has step-up and increased the expectations of customers of land registration and cadastral services. With new innovations, users begin to think of additional requirements, even though they were not expecting the present possibilities, they think of new use or additional requirements. Technology also motivates and stimulates new market. Customers' expectation (y) may increase by up to 200%, if there is about 100% improvement in technology (x), thus $y = \frac{1}{2}x$ at different moments in time, for different values of x. This idea represented graphically in figure 5.2 is not empirically proven; it is a hypothesis that may be tested experimentally in a land information marketing research. In fact, the ratio may be higher with the present rate of accomplishments in Geo-ICT and increasing awareness of the customers. A customer wants to have access to land information from any location at anytime. In many technologically advanced countries, customers want to have access to land information in 24 hours of the 7 days in a week. Of course, this is not impossible, but it must be backed with sufficient resources and guaranteed return on investments.

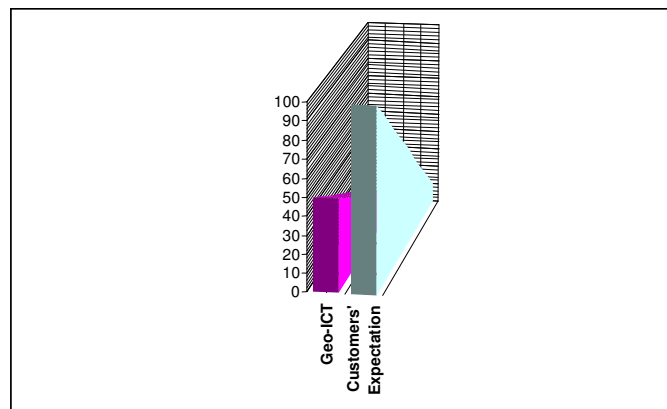


Figure 5-2 Author's view on Geo-ICT advancements in comparison with customers' expectation

A survey carried out by the Netherlands Cadastre and Land Registry Agency shows that the customers of the Dutch Cadastre want to have access to information 24 hours a day, 7 days a week, at home and in the office (anytime any place). The customers want their land service provider to be reliable, accessible, timely, professional and providing easy to use products that are relevant to their aspirations (Magis, 2002). According to Magis, the citizens want “*integrated service delivery*”, that is a one-stop solution, instead of having to call different government departments for an answer to a question and they want to have access to information through the internet.

Online delivery of cadastral and land registration services is becoming increasingly popular in technologically advanced countries. Customers can now access land registration and cadastral services through their web browsers. This is possible with the server-side approach (thin client) of the client-server architecture. The server-side approach allows client or user to submit requests for data and analysis to the web browser. The server(s) processes the requests and returns the result or output to the remote client. Everything appears seamless to the customer, he or she is not aware of the internal operations of the producer’s systems which may be physically separated or a distributed system. Morales (2004) define a distributed system as a “*system whose parts are physically or logically separated and operate in a partially autonomous way*”. Each part of a distributed system exhibits a behaviour that is partially independent from other parts (Morales, 2004).

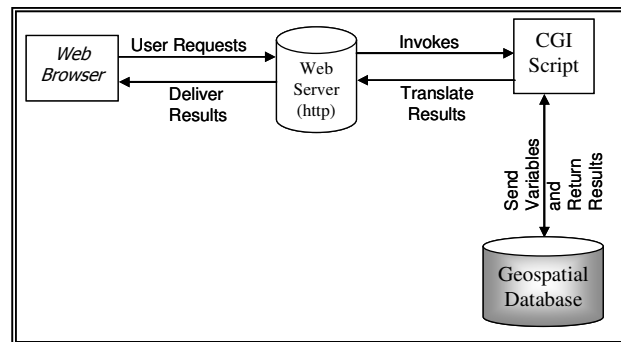


Figure 5-3 Internet GIS Server-Side Approach

Adapted from Peng, Zhong-Ren & Tsou, Ming-Hsiang (2003)

The server-side technology provides a solution to meet the expectations of customers for online LIServices. It uses the Common Gateway Interface (CGI) and the Application Programming Interface (API) procedures. These two approaches are not discussed in this thesis, they are extensively discussed by (Peng and Tsou, 2003). It is however worthy of note that CGI and API as server-side approach involve too many resources, consequently there is heavy server workload. The most frequently used server-side procedure is the CGI script to link the Hypertext Markup Language (HTML) with Geospatial database as shown in figure 5.3. A careful study of figures 5.3 and 5.4 reveals the capabilities of the server-side solution in providing customers with one-stop shopping solution.

It is also possible to use Remote Manipulation Control Interface (RMCI) or Java to access a dynamic and flexible Business Application Server (BAS) for land registration and cadastral services (Tuladhar, 2004). The BAS could also be accessed through the Internet Explorer or Netscape Navigator as in figure 5.4. This solution provides an excellent and relatively cheap opportunity for remotely located customers to have access to LIServices. This is a high-level accessibility, which customers would generally be happy with, for example, it is possible for the customers of the Dutch Cadastre to access

information online without passwords, i.e. no wasting of time in filling online forms for registration, which is the opposite of the RSA's DeedsWeb shown in figure 0.1 (appendix 1) where the users are required to register.

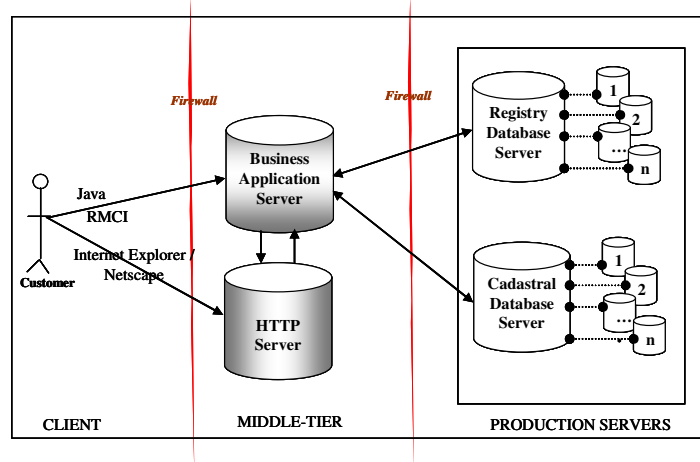


Figure 5-4 LRCI enterprise modelling concept based on server-side solution

Adapted from Tuladhar (2004)

The emerging European Land Information Service (EULIS) provides access to core information for each participating country, namely: Sweden, Finland, England and Wales, Scotland, Austria, The Netherlands, Lithuania and Norway. It is possible to find properties on the website (<http://www.eulis.org/>) using *clickable maps* as an interface and online searching of property *by address*.

The growing use of the Internet in our daily life from making new friends (<http://www.oculartravel.com/>), to e-commerce (<http://www.easyjet.com/>; <http://www.amazon.com/>), to e-governance (<http://www.nigeriafirst.org/>; <http://www.ondostategovernment.com/>), to real-time weather information (<http://www.rap.ucar.edu/weather/model/>) to e-mails and conversations via interactive chatting have made the Internet more significant in the development of LIS solutions. The Internet will play prominent roles not presently recognised by LIS service customers in Ondo State, because the accessibility to Internet is increasing on a daily basis. Prices are also falling, for example, in 1998, browsing on the Internet was about ₦30.00 per minute in Akure the state capital, but now (2004) about ₦1.70 per minute. This represents about 18 times decrease in the price over 6 years, with more cybercafé using faster computers. Internet Service Providers (ISPs) are also conscious of the fact that the cybercafé business is becoming saturated and the ISPs are now investing on the delivery of Internet services to users at homes and offices. These points to the fact that costs and availability are gradually becoming a less important constrain in the use of the Internet in Ondo State and the likelihood of faster acceptability of online LIS services by the presently unwilling customers.

5.7. Concluding remarks

The growth of LIS is largely dependent on availability of resources for the development and maintenance of supporting infrastructure. Five approaches were suggested for funding, but all the solutions may be exploited concurrently. A sustainable cadastral and land registration system forms the keystone of a stable polity, improved economic performance and provides the citizens with the confidence they need when going into the land market. When the vast unrecorded properties are documented, they become rich source of income for the state and a mechanism for the enriching the

people. However, it is important to monitor the developments in Geo-ICT and be able to anticipate the future needs of customers with the hope of using an appropriate technology to meet their expectations. Although, most of the customers are presently uninterested in online delivery of LIServices, this position will change as soon as there are improvements in the present level of services. The customers would ask for more and one of their new requests predictably would be online services.

6. Evaluation, implementation guidelines and conditions

6.1. Introduction

The models and architecture in chapters 3 and 4 were derived following iterative process of systems development during which requirements were converted into working models that were continuously revised throughout the research period. The prototype was built with limited production runs and tested in this chapter for functionalities derived from user requirements. The evaluation also includes other important, but often ignored parameters, such as finance, transparency, accountability and communication. This approach satisfies user needs by focussing on the results of the user requirements survey and analysis, and observation of processes and situation analysis. Implementation guidelines and conditions were provided to support the creation of an efficient and effective single-window based production system.

6.2. Evaluation of the LRCI

The LRCI was evaluated with respect to the following:

- sufficiency of models;
- design of the proposed system;
- service provision competence (testing of the prototype);
- financial matters and revenue generation;
- transparency and accountability prerequisite and
- communication.

6.2.1. Sufficiency of the models

As mentioned in section 3.8.5, the model for improvement was tested with users and stakeholders and was thoroughly validated in a workshop. The results of the situation and users' requirements analyses and validated model for improvement produced the data model for the LRCI. The models were also validated with some colleagues and experts, bringing the iterative process to an end. All the models were considered realistic at the moment and sufficient for the required level of single-window access within the LIService provider's organisation.

6.2.2. Design of the proposed system

A sketch of LRCI architecture designed on the field was validated with users and stakeholders during the last week of the fieldwork. The final design was also discussed with experts and colleagues, the various inputs and comments were used for improvement to derive the final version portrayed in figure 4.1. The architecture is considered appropriate for improving the availability of land registration and cadastral information in the study area.

6.2.3. Service provision competence

The service provision competence of the LRCI is mainly the testing of the prototype with respect to services usually requested by the users. All the requirements by both regular and ad hoc users (figure 3.3, table 3.1 and figure 3.12) were modelled and built into the prototype with data collected during the fieldwork. The system was evaluated for the provision of 3 services:

- (i.) confirmation of C. of O. and certified true copies;
- (ii.) alienation of right of occupancy (mortgage and transfer);
- (iii.) parcel history and mortgage status.

6.2.3.1. Confirmation of C. of O. and certified true copies

This is a common request from legal practitioners and courts as evidence in land and property related cases. The photocopy of a certified true copy of public document is admissible in evidence in a court of law, because section 95 of the Evidence Act makes provision for the admissibility in evidence of copies made from original by mechanical processes (Aluko, 2001). But more often than not, advocates request for certified true copy of a registered instrument from the deeds registry and a court of law reserves the right to confirm such instrument from the registry. The prototype was tested for granting a certified a certified true copy to an advocate using the process in table 6.1, use case and activity diagrams in figures 6.1 and 6.2. The service is completed in 6 steps and the last 2 steps are internal administrative functions and updating. If we assume that the endorsement by the USC office will take 15 minutes, the process will be completed in less than 25 minutes, indicating a significant improvement. The present duration is not clear, but may vary from weeks to months.

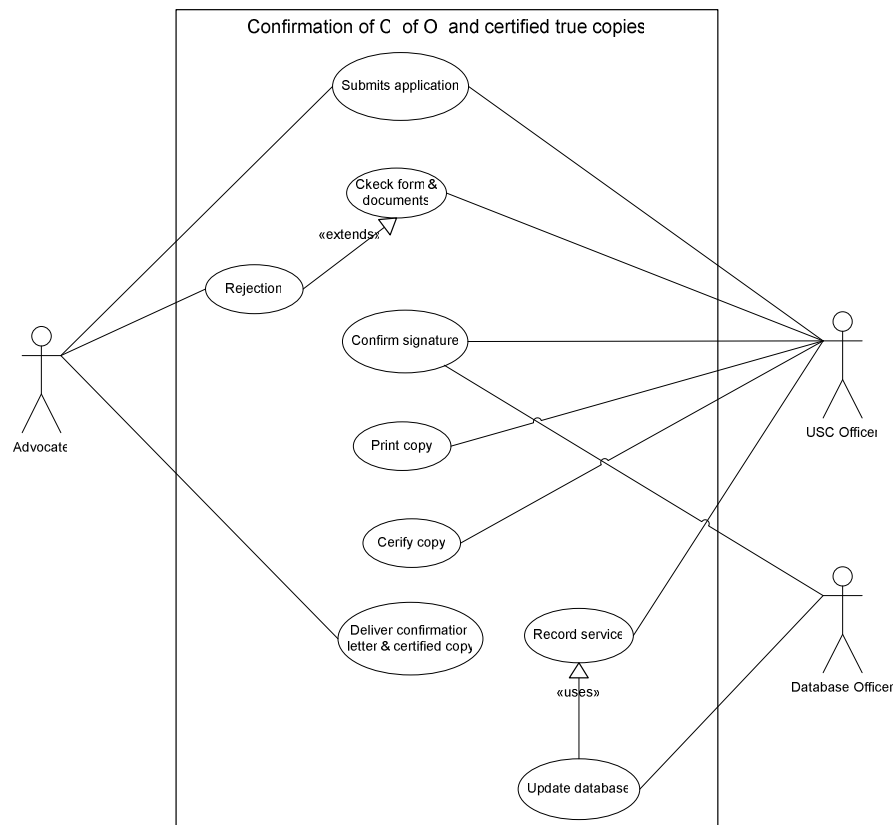


Figure 6-1 Use case diagram for testing confirmation of C. of O and issuance of certified true copy

Step	Event	Explanation
1	Advocate submits application to the USC	Application form must be signed by the occupier, before submission by his or her advocate; otherwise the original or a copy of the issued instrument is required. Evidence of payment of the prescribed fee for confirmation of C. of O. must accompany the application.
2	USC checks the application form	Checking of application form (registration information or records: <i>Occupier_ID</i> , <i>Doc_ID</i> , <i>BillsPay_ID</i> , etc, see figure 4.8) and accompanying documents (payment of prescribed fee, etc) and cross-checking with the information in the database.
3	Confirm occupier's signature	Verification of the signature of the occupier on the application form with the signature on the C. of O. in the <i>Documents</i> database.
4	Printing	Printing of a copy of the C. of O. from the database.
5	Certify copy	Stamping and endorsement of the printed copy by the authorised officer.
6	Delivery	Delivery of confirmation letter and certified true copy to the advocate.
7	Document service	The responsible USC personnel record the completion of the process.
8	Update database	The responsible USC personnel notify the Geo-ICT about confirmation and certification. The database officer in the Geo-ICT updates the documents database.

Table 6-1 Process for confirmation of C. of O. and issuance of certified true copies

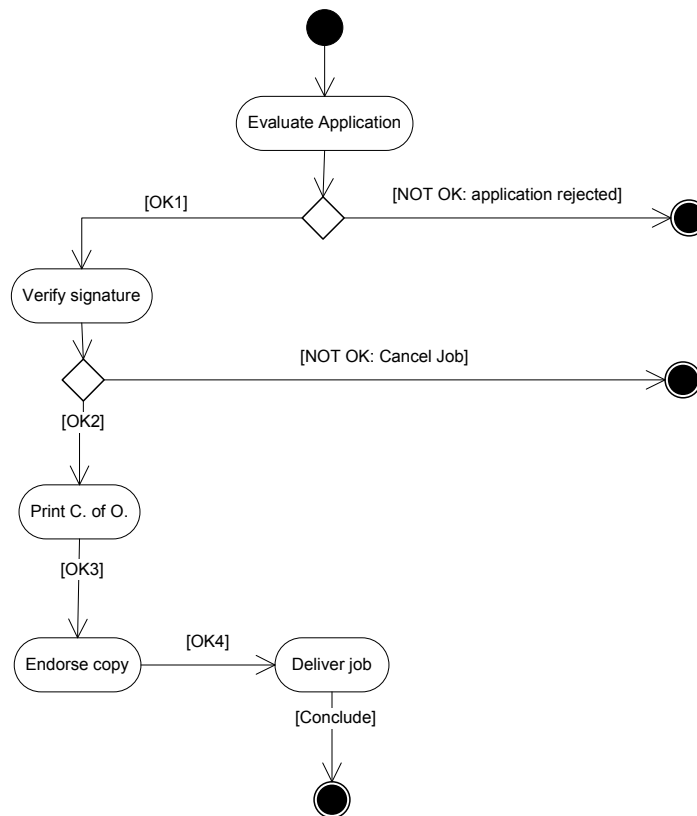


Figure 6-2 Activity diagram for confirmation of C. of O. and issuance of certified true copies

The prototype also supports confirmation of C. of O. to a court or Ministry of Justice. The testing was based on:

- filling of appropriate form by the representative of the court to provide required information or
- an official letter of request accompanied with a copy of the instrument.

This testing was performed through the *Ownership*, *Documents* and *Certificate* relations (figure 4.8). It is possible to confirm C. of O. within 30 minutes to in-person customers. Post and delivery by the USC will take longer time. Thus, one of the conditions for implementation is improvement in postal

services system, which is outside the scope of this research, therefore a suggestion, may be for customers to request for the services of courier companies for the pick-up and delivery of their requests as done by some embassies in Nigeria for visa applications.

6.2.3.2. Alienation of right of occupancy (mortgage and transfer)

Section 22 of the LUA makes it unlawful for the holder of a statutory right of occupancy to alienate his or her right of occupancy or any part thereof by assignment, mortgage, transfer of possession and sublease without the consent of the Governor. It is not mandatory that the letter of consent should be signed by the State Governor personally; any officer in the MWLH can sign the letter of consent. According to Aluko (2001), court rulings have upheld this fact, the Governor can delegate this function to the Honourable Commissioner in charge of lands and the Commissioner can delegate the function to the head of the USC. Based on this position or realistic assumption, the prototype was tested for consent to mortgage and consent for transfer of a statutory right of occupancy. The process used for the testing of consent to alienate by mortgage is summarised table 6.2, the corresponding use case and activity diagrams are in figures 6.3 and 6.4, while the process for consent to alienate by transfer of a statutory right of occupancy is shown in table 6.3, with use case and activity diagrams in figures 6.5 and 6.6.

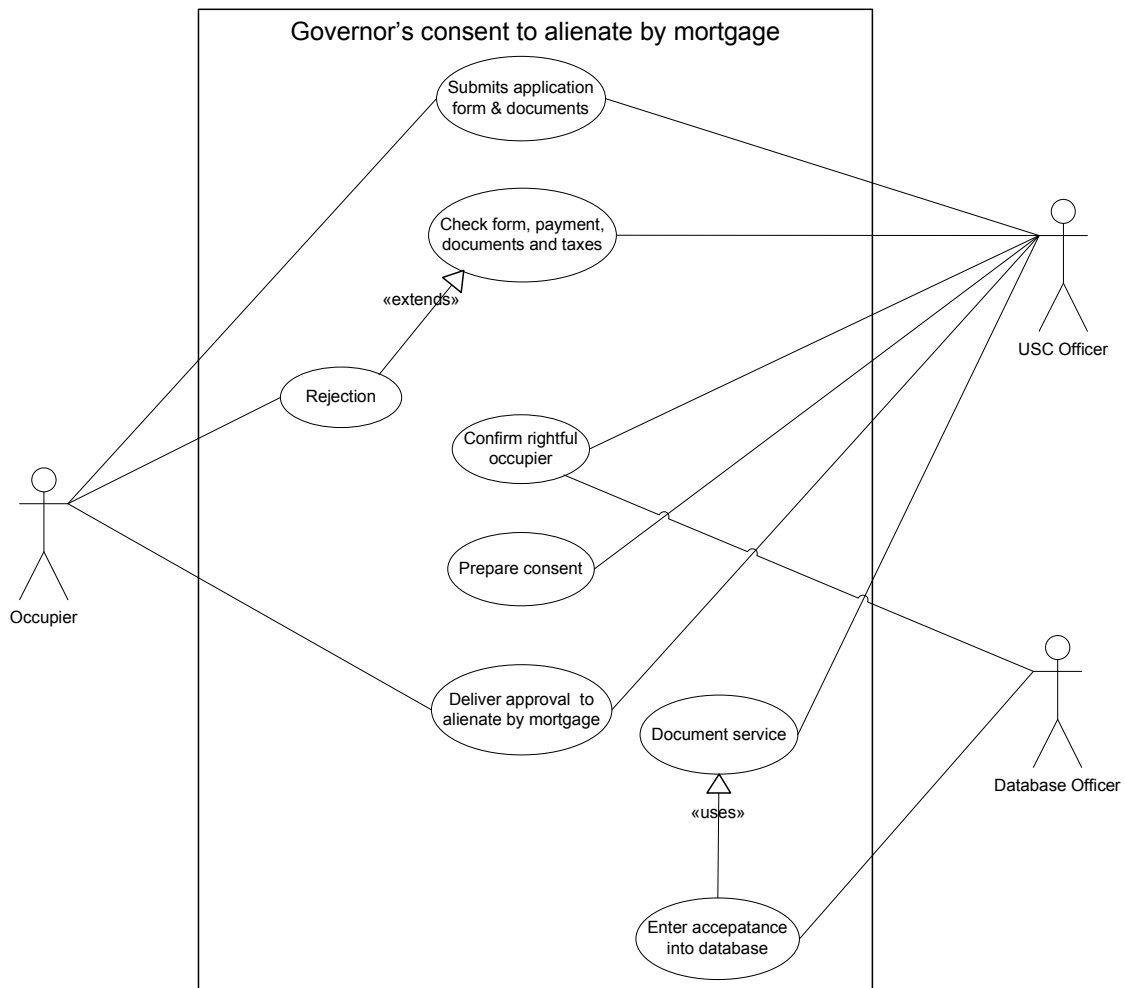


Figure 6-3 Testing of consent to alienate by mortgage: use case diagram

If the occupier comes to the USC to request for consent to alienate by mortgage or transfer, fulfils all financial requirements and submits the application with required documents, the process will take an average of 25 minutes. Additional time is however required for the preparation and signing of the consent, about 30 minutes is estimated for a networked environment, bringing the total duration to 55 minutes. The time estimate is based on the use of already prepared templates for the consent approval. This situation will not be applicable to delivery of the service by post. Additional time has to be calculated for postage.

Step	Event	Explanation
1	Occupier submits application to the USC	Submission of official application form, duly signed by the occupier with passport photographs.
2	USC checks the application form	Checking of application form, attached documents, evidence of payment of prescribed fee, and taxes (payment of 3 years Ondo State development levy, 3 years income tax clearance, up-to-date payment of annual ground rent and annual property tax).
3	Verification	Authentication of information from <i>Documents</i> database to ensure that the person applying for the Governor’s consent to alienate by mortgage is the rightful occupier and the property is currently not under any mortgage .
4	Data Entry	Entry into <i>Document</i> database (<i>Mortgage</i> relation, see figure 4.8).
5	Delivery of consent to occupier	Issue of Governor’s consent to alienate right of occupancy by mortgage.

Table 6-2 Process for consent to alienate by mortgage

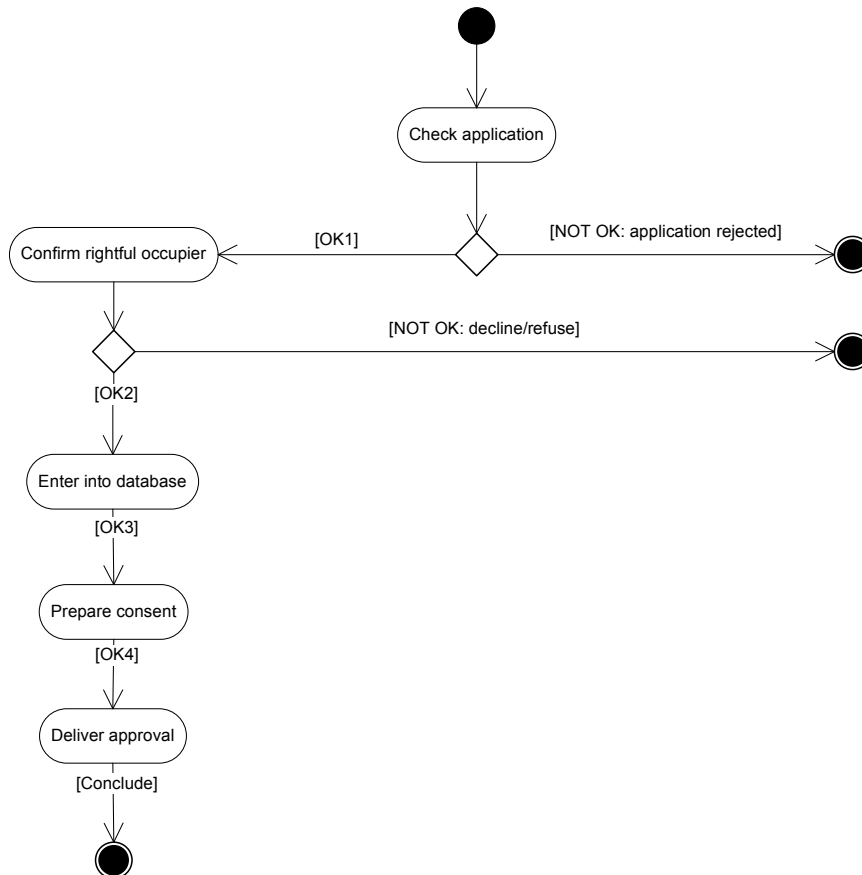


Figure 6-4 Testing of consent to alienate by mortgage: activity diagram

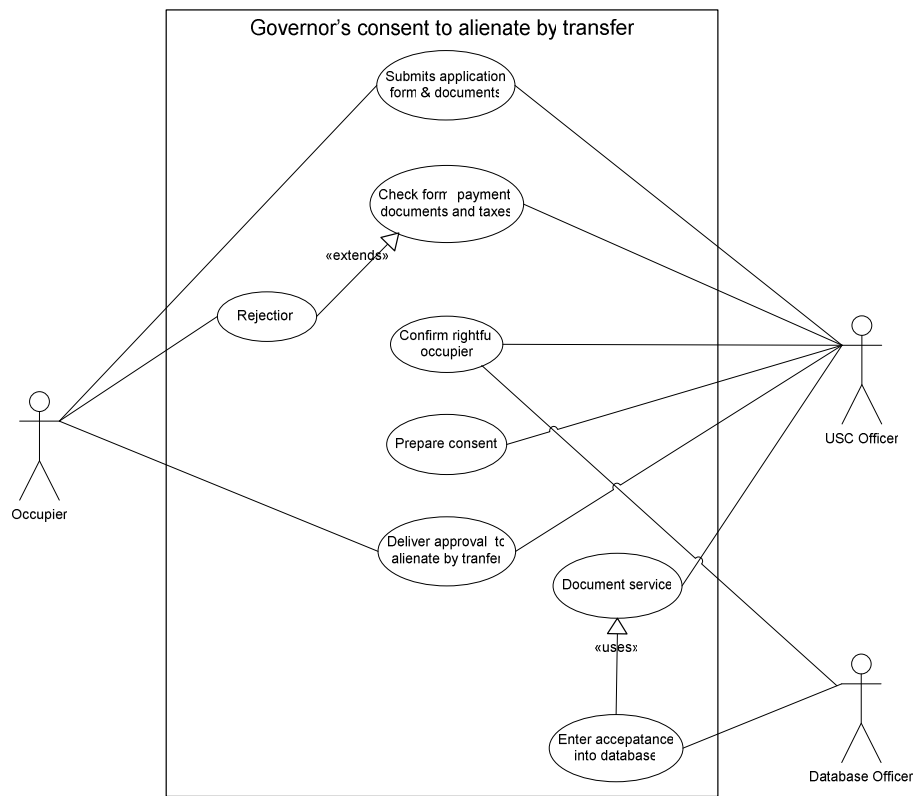


Figure 6-5 Use case for testing Governor’s consent to alienate by transfer

Step	Event	Explanation
1	Occupier submits application to the USC	Submission of official application form, duly signed by the occupier with passport photographs. If the consent is to alienate part of the land or property, an approved survey plan (re-survey) must be attached to the application for transfer. When the transfer is for the whole property (no change in spatial attributes of the parcel), a re-survey or new approved survey plan is not required. In all cases an agreement signed by the transferor (grantor) and the transferee (grantee) in the presence of a Notary must be attached to the application for Governor’s consent to alienate by transfer ¹⁰ .
2	USC checks the application form	Checking of application form, attached documents, evidence of payment of prescribed fee, and taxes (payment of 3 years Ondo State development levy, 3 years income tax clearance, up-to-date payment of annual ground rent and annual property tax).
3	Verification	Authentication of information from <i>Documents</i> database to ensure that the person applying for the Governor’s consent to alienate by transfer is the rightful occupier and the property is currently not under any mortgage .
5	Data Entry	Entry into <i>Document</i> database (<i>Transfer</i> relation, see figure 4.8).
6	Delivery of consent to occupier	Issue of Governor’s consent to alienate right of occupancy by transfer of possession: whole or part.

Table 6-3 Process for consent to alienate by transfer

¹⁰ Hand over of title or interest in writing, signed by all the parties involved and witnesses.

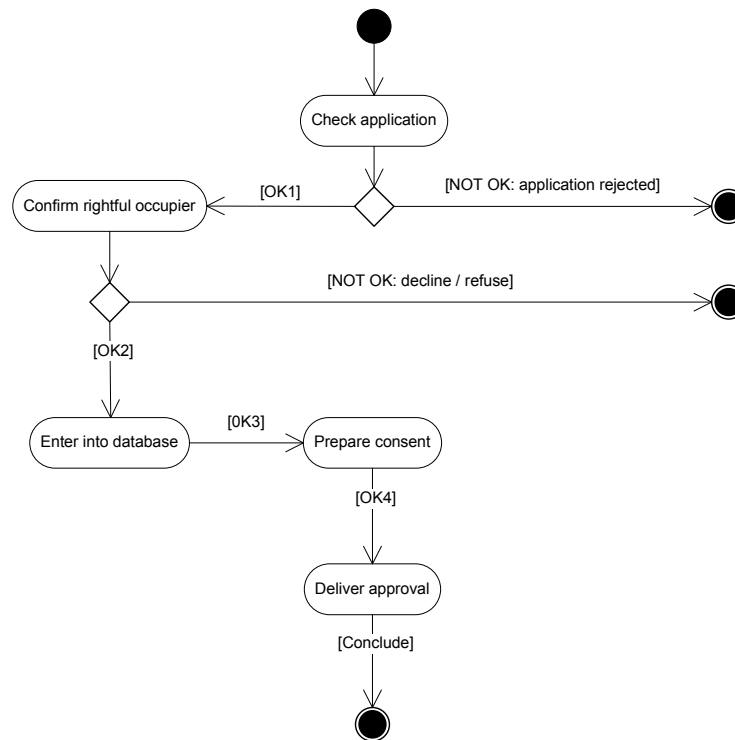


Figure 6-6 Activity diagram for consent to alienate by transfer

6.2.3.3. Parcel history and mortgage status

The mortgagee has fixed and absolute right in a property until the property is redeemed by the mortgagor. To all intents and purposes, the mortgagor cannot transfer a valid title in a mortgaged property to a third party. Any natural or non-natural person that buys a mortgaged property from the mortgagor when the deed of legal mortgage is still applicable and legitimate takes the property subject to the right of the mortgagee. The buyer can only keep hold of the property if he or she is prepared to settle or settles the debt that the mortgagor is owing the mortgagee, otherwise the transaction (sale and purchase) is inoperative may be set aside by a court of law. Accordingly, the members of the public try to prevent this situation by getting sufficient or convincing information on a property before making financial commitment. They usually request for parcel history and mortgage status and the prototype was tested for this function as shown in table 6.4, figures 6.7 and 6.8.

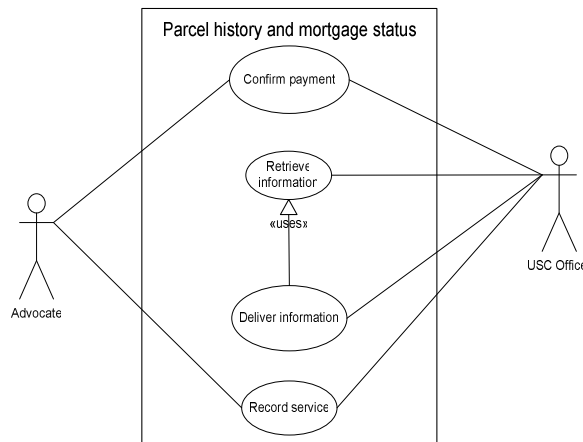


Figure 6-7 Request for information: parcel history and mortgage status

From the prototype, the processing time for this operation is less than 15 minutes. This is obviously not unexpected, because simple retrieval of information is one of the easiest tasks in a digital environment. In the analogue working procedure, the information may not be available, damaged or destroyed. When available, the time spent on searching storage devices such as shown as in appendices 6 to 10 will be tiresomely long or seemingly without end. Backups and external storage prevents the problem of loss of data in a digital working environment.

Step	Event	Explanation
1	Occupier submits application to the USC	Submission of information request form and payment of prescribed fee (property history and mortgage status).
2	USC confirms payment	USC checks evidence of payment of the prescribed fee for the requested information.
3	Retrieve information	Retrieval of requested information from appropriate database. In this example, the requested information are history and mortgage, they are available in the Documents database: <i>Text</i> and <i>Mortgage</i> relations.
4	Deliver information	Delivery of requested information to the customer.

Table 6-4 Request for information process

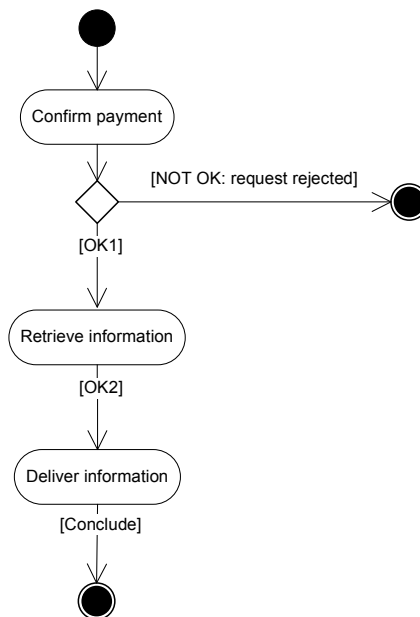


Figure 6-8 Request for information (activity diagram)

6.2.4. Summary of service provision competence

The result of the testing of the prototype for service provision is presented in table 6.5. The deficiencies of the current situation are again reflected in the unclear duration of processes for delivery of services. The activity diagrams are simply workflows and may not be in standard UML.

No.	Service	Current duration	Duration in improved system
1	Confirmation of C. of O. and certified true copy.	Weeks to months (not clear)	Less than ½ hour.
2	Alienation of right of occupancy (mortgage and transfer).	Weeks to months (not clear)	Less than 1 hour.
3	Parcel history and mortgage status.	Not clear.	Less than ¼ hour.

Table 6-5 Processing times in current and proposed situations

6.2.5. Transparency and accountability

As mentioned in section 3.8.5, one of the responsibilities of the USC is to provide information on all services, products and fees. The USC can ensure transparency by publishing all fees in conspicuous places in the USC and on the Internet. The *Bills and Payment* relation in the *Documents* database is proposed to record and check all records relating payments. The relation confirm payments and it cross-checks the information contains in the *Taxes* database.

The following actions identified under weakness and opportunities strategies (WO3: Integrate production processes and ensure transparency) in table 3.7 will provide the foundation for accountability and transparency in the operation of the infrastructure:

- periodic publication of technical and management articles and reports, with information on processes, fees and methods of payment;
- placement of fees and procedures in conspicuous places in the USC and on the Internet;
- prevention of any form of unofficial payments and ‘*gifts*’ from customers;
- education of staff on the negative effects of and integrity deterioration on the organisation and the employees; and
- provision of stiff penalties for white-collar malpractices.

6.2.6. Financial matters and revenue generation

The scaled version of the desired information system is embedded with functions that would ensure transparency and speedy delivery of services, especially reduction in processing time and rapid access to financial position of occupiers. The effects of these are three: customers will be more hopeful, confident and positive about payments; the payments can be easily monitored by the service provider; and there will be cost savings on the sides of the provider and customers.

The financial status of occupiers (annual ground rent, annual property tax, etc) can be examined regularly to determine defaulters and remind them of their indebtedness, followed by appropriate activities to recover debts, for instance prosecution in accordance with the LUA and other legislations. As shown in figures 6.2, 6.4, 6.6 and 6.8, the infrastructure supports the design of workflows that will reject, decline or refuse services when prescribed fees and state taxes have not been paid. These protocols could step up land and property related revenue through the USC by up to 50% of the present earnings, and one may expect additional increase of up to 30% with the implementation of the actions reemphasised in section 6.2.4. In essence, income of the state government from land and property related services may increase gradually to up to 80% at full implementation of the LRCI.

However, the enhancement of funding for performance improvement in the delivery of LIServices is not guaranteed, but achievable with appropriate institutional and organisational improvements suggested under conditions for implementation in section 6.4. This is largely because the service provider does not have direct access or control over revenue generated by their organisation.

6.2.7. Communication

The infrastructure provides for a customers services and public relations unit that can be used to expand customers’ power and accessibility to complaints and redress mechanisms. The service provider will also use the various communication channels to resolve conflicts, build trust and enhance perceived value by customers. The design of the infrastructure as shown in figure 4.1

supports internal communication within the LIService providing organisation (MWLH) and communication with external users (regular and ad hoc). Various channels of communication (phone, fax, in-person, email and traditional post) are also incorporated in the design for government agencies and other organisations outside the MWLH.

6.3. Implementation guidelines

6.3.1. Simultaneous phased implementation

The realisation of improvement in the availability of land registration and cadastral information through a single-window access within the provider’s organisation is planned in three stages, these are: preliminary, transitional and final phases. Though, activities have been identified for each phase, the nature of the relationship between the predecessor and successor determines the type of activity dependency and schedule. While the output of an activity may be the input into another, the simultaneous phased implementation approach does not suggest a ‘finish-to-start’ solution. The activities may run in parallel as presented in figure 6.10, i.e. thus producing a series of activities occurring or operating at the same time referred to as a simultaneous phased implementation method. The explanations of the phases and activities within each phase are described in figure 6.9 and table 6.6.

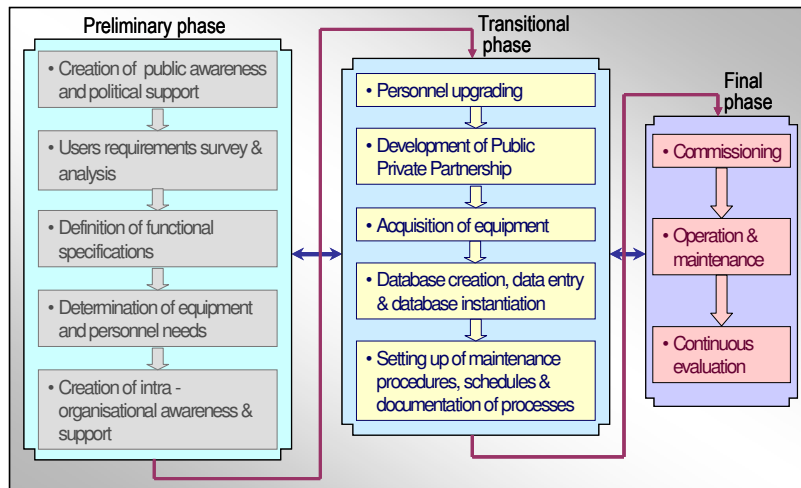


Figure 6-9 Proposed implementation phases

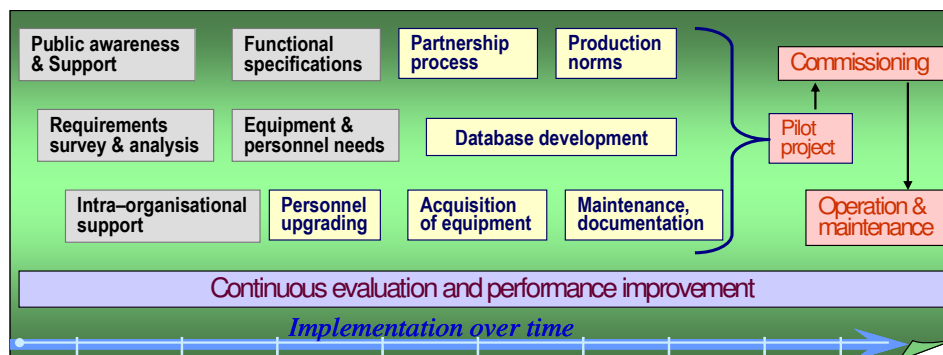


Figure 6-10 Simultaneous implementation of the phased activities

No	Activity	Explanation	Output
Preliminary phase			
1	Creation of public awareness and political support	Make citizens cognisant of the advantages in registration of land and properties. Sell the idea to private companies, not-for-profit organisations, labour congress and donor agencies. Propose institutional guidelines and seek support of the politicians and policy makers.	Recognition of the need for investment in LIService provision.
2	Users requirements survey and analysis	A comprehensive survey and subsequent analysis of the present and future needs of customers. Attention must be given to users unspoken or implied needs.	Users' requirements report.
3	Definition of functional specifications	A detailed description of what the new system will do (products and services), noting the components and how users will interact with the system.	A blueprint on how the new system would look like.
4	Determination of equipment and personnel needs	Deriving manpower and equipment requirements from the users' requirements report and functional specifications.	Specifications on hardware, software, network design, databases, user interfaces and other equipment. List of positions, with description of responsibilities.
5	Creation of intra-organisational awareness and support	Ensure that employees in other departments in the organisation are not ignorant of the development of the new infrastructure or system. Involve key officers in other departments.	Internal awareness and understanding.
Transitional phase			
6	Personnel upgrading	Match existing staff with the positions for processes of the proposed system. Train current staff in areas of deficiencies and recruit new staff to fill positions that present staff do not match.	Well trained and competent workforce.
7	Development of PPP	Identify potential partners in the private sector. Initiate discussion and negotiation based on collective responsibilities, commitments, benefits and control.	Concluded partnering process.
8	Acquisition of equipment	Purchase, delivery, installation and testing of equipment (hardware, software, etc).	Functioning equipment.
9	Database creation, data entry and database instantiation	Design of database based on users' requirements, hardware and software selections. Data entry and database testing.	Operational database.
10	Setting up of maintenance procedures, schedules and documentation of processes	Establishment of measures and time for system checking and routine maintenance. Develop infrastructure's manuals with diagrams describing the network. Building up of well defined process and quality control measures.	Maintenance schedule and modus operandi. Infrastructure's manuals.
Final phase			
11	Commissioning	Official opening and granting of authority to undertake renewed LIService provision. Marketing of products and services through newspapers, television, radio and internet.	Officially approved public infrastructure with well-known capabilities and patronage.
12	Operation and maintenance	Daily operation of infrastructure, routine maintenance of equipment, training and retraining of staff.	Competent personnel using appropriate equipment without brakedowns.

13	Continuous evaluation	Regular evaluation of the system based on efficiency and effectiveness, using internal and external performance indicators. Annual financial auditing and inventory of equipment.	Performance reports and feedbacks for improvement.
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Table 6-6 Implementation phases and corresponding activities

6.3.2. Performance indicators and measurement

It is difficult to sustain and improve a service or product that cannot not be assessed or appraised. Thus, the need to develop performance indicators for internal efficiency of an infrastructure and external performance in terms of meeting stated objectives with respect to customers' satisfaction. Performance indicators are variables to measure the changes in a process and function. The processes are usually internal activities of an organisation to permit certain functions. The users of a function will expect some benefits, which may be measured to give an indication of performance. The measurements should be carried out at regular intervals to track the way the infrastructure is behaving, monitor progress and evaluate the quality of products and services.

Performance indicators will show how well services and products are performing against set targets and will motivate a LIService provider to be accountable to their customers, even in a monopolistic market. LIService operational performance indicators will include:

- friendliness and helpfulness of staff;
- openness and clarity of cost of products and services;
- payment possibilities / payment methods available;
- time-taken to fill request form;
- delivery times for all activities related to statutory right of occupancy, e.g. C. of O., enquiries, C. of O. confirmations, alienation consents, etc.
- service centre accessibility and contact: internet, fax, phone, post, in-person, parking space, waiting hall, etc.

Satisfaction of the customers would be indicated by:

- value after delivery (e.g. for mortgage, performance bond certificate, etc);
- ease of alienation of right of occupancy by assignment, mortgage, transfer, sublease, subdivision, etc;
- certitude in parcel demarcation and low incidence of boundary disagreement between occupiers;
- price vis-à-vis value (Tuladhar et al., 2004) and (Paresi, 2004).

The following options are proposed for the measurement of the performance of the LRCI:

- Calculation of average profit loss due to customers' defection (pld) as a result of increasing customers' disloyalty.
- Assessment of customers' satisfaction.
- Analysis of acceptability of cost of products and services.

6.3.2.1. Profit loss due to customers' disloyalty

Customer Loyalty (CL) is a measure of commitment of a client or user towards a particular product or service of a provider. It is true-heartedness on the part of the consumer that is to the advantage of the provider. CL loyalty directly translates into customer retention, implying that a LIService provider

having high customer loyalty also enjoys competitive advantage and corporate profitability (Reichheld, 1996). CL has perceptual and transactional constituents. Measurements of the perception are based on customer attitudes, opinions and sentiments / feelings. Transactional measurements are built on customers contemplated or actual purchase behaviour, e.g. the predisposition of the customers towards making repeated purchases (Satmetrix, 2001). Generally speaking, satisfied customers usually acknowledge good service or product with repeated patronage, bringing a quantifiable unit in terms of profit for the provider. (Oliver, 1994) noted that customer satisfaction results from a process internal appraisal that actively compares expectations before purchase with perceived performance during and at the end of the purchase experience. He established that “*the smaller the discrepancy between the customer’s expectations and the perception of the purchase, the higher the resulting satisfaction level*”. It is likely that decreasing customer loyalty caused by customers’ dissatisfaction may bring declining profit to a LIService provider. Other factors such as inefficient production system and poor marketing strategies may cause profit loss, if it is assumed that all these other factors are constant (k) and $k = 1$, then one can:

- determine the number of loyal customers (n), based on a factors such as customer that buys a product often or frequently request for a service, period must be specified;
- calculate the profit (p) made on each loyal customer for the specified period;
- add p for all n , and divide by n to give the possible average profit loss due to customers’ deflection (pld). The pld is like an ‘early warning system’ that informs the provider on the average profit that they may be lost on deflection of a customer as a result of dissatisfaction.

Mathematically, pld may be defined using the common formula for finding a mean, i.e.

$$pld = \frac{1}{n} \sum p_i, \text{ where } i \text{ takes the values of } 1 \text{ to } n.$$

6.3.2.2. Assessment of customers’ satisfaction

Customers’ satisfaction in the delivery of services can be assessed internally by LIService providers through performance results obtainable from performance targets. The first step is to set performance targets for products and services. The example in table 6.6 set targets for processing and delivery of C. of O., confirmation of C. of O. and response to request for information.

No.	Performance target ¹¹	Achievement (Year/month)	Remarks
1	To process a specified percentage (50%, 75%, etc in stages) of all incoming requests for granting of statutory rights of occupancy and deliver certificate within 30 working days.	This gives the level of accomplishment of each target in percentage. It should be measured at regular intervals, annually, biannually or quarterly.	Comments & notes on each performance target.
2	To process a specified percentage (50%, 70%, 90%, etc in stages) of C. of O. without any complaint.		
3	To confirm C. of O. to financial institutions within 5 working days, from any location in Nigeria.		
4	Confirm all correspondence from any location in Nigeria within 5 working days.		
5	Set maximum waiting time: e.g. 80% of in-person customers will not wait for more than 30 minutes.		
6	Grant specified percentage (50%, 70%, 90%, etc in stages) of consents to mortgage within 5 working days.		
7	Answer 90% of telephone enquiries within 90 seconds, etc.		

Table 6-7 Assessing customers’ satisfaction by setting performance targets

¹¹ The performance targets could be phased during implementation.

Customers’ perceived performance after delivery of the C. of O. could be measured on an ordinal scale and assign values as presented in table 6.7.

No.	Perceived value	Rating Order	Quantification of ordered perception	Remarks
1	Value after delivery (e.g. for mortgage, performance bond certificate, etc).	Suggested ratings are High, Medium, Low & No value.	3 = High value 2 = Medium value 1 = Low value 0 = No value	Comments & notes on each perceived value.
2	Ease of alienation of right of occupancy.			
3	Certitude in parcel demarcation.			
4	Assumed value of C. of O. compared to the amount paid, etc.			
A mean of the rating of the quantified ordered perception could be found to give the overall perceived performance of the product, i.e. high value, medium value, low value and no value.				

Table 6-8 Estimating perceived performance

6.3.2.3. Analysis of acceptability of cost of products and services

A qualitative approach would be to analyse acceptability of cost of acquisition of a specified product or service, e.g. acquisition of a statutory right of occupancy, evidenced with a C. of O. and determine value of the C. of O. after delivery to customers. The cost as in figure 6.10 may be high or optimal. An optimal cost is the most desirable price of acquiring a C. of O., possible under current economic situation in a market with limited government control (the price is acceptable or satisfactory to customers). Low is not used because a low cost may mean subsidising the product or service and selling below the production cost. Customers may not agree that a price is low, but may accept that the cost of a service or product is reasonable; this gives an optimal cost for C. of O. on the side of the consumer and a non-overgenerous price on the side of the provider.

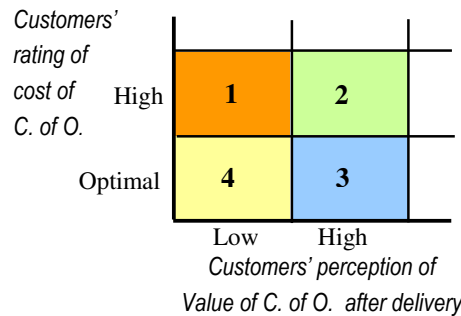


Figure 6-11 An approach for analysing acceptability of LI cost

Value	Meaning	Expected customers condition
1	Cost is high, value is low	Not satisfied (unhappy and disappointed)
2	Cost is high, value is high	Intolerable satisfaction (unacceptable)
3	Cost is optimal, value high	Satisfied (happy and fulfilled)
4	Cost is optimal, value is low	Apathetic satisfaction (indifferent)

Table 6-9 Explanation of the results of the cost and value analysis approach

The customers would be asked to express their judgements with respect to cost C. of O. against the value of C. of O. after delivery. The collected data could be analysed and presented in ordinal and qualitative form. This technique as shown in figure 6.10 and table 6.8 would reveal unhappy and disappointed, unacceptable, happy and fulfilled, and indifferent conditions of the customers.

6.4. Conditions for implementation

An infrastructure does not exist in isolation; rather it is surrounded by conditions or circumstances that will either have positive or negative effects on the daily operation and dependability of the infrastructure. On the other hand, an existing, a new or proposed infrastructure or system will have socio-cultural and economic consequences. For example, social conditions will shape the application of a GI technology and GI technology will also have social impacts on the people (Man and Toorn, 2002). Thus, there is a need to recognise and analyse the various factors or issues that would play important role in the implementation of the LRCI. Figure 6.12 presents the interplay of factors requiring attention to facilitate profitable functioning and delivery of good quality services and products by the LRCI.

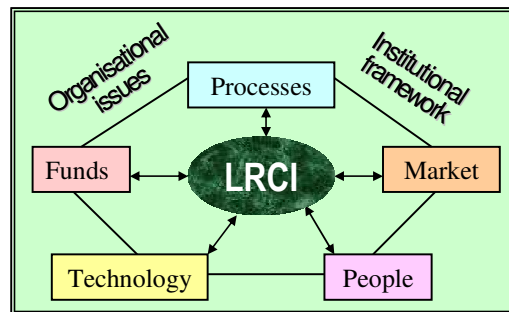


Figure 6-12 Major concerns in the implementation of the LRCI

Funding, property market, people, processes and technology exist within institutional framework and organisational structure that will have practical consequences on the take-off and day-to-day operation of the LRCI. According to North (1990), “*institutions are rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction*”. Formal and informal institutions forbid or allow events that take place when dealing with property rights and transactions, for instance informal institutions that discriminate on the basis of gender will have negative consequences on LIB and poverty alleviation (see chapter 5). Institutions affect the degree of corruption and fraudulent practices, operation of monetary and fiscal policies, corporate governance, political stability and land policy implementation.

Organisations provide a configuration to human interaction, i.e. the structure for operating the rules of the game. Organisations are players of the game (North, 1990); a good institutional framework will dissipate within a poor organisational arrangement, not yielding the desired results. Therefore there is a need to put in place for the LRCI an organisational arrangement that:

- ❑ provides clear understanding of roles and responsibilities;
- ❑ assigns leaders and champions rather the ‘big bosses’ and creates a front burner state of mind;
- ❑ supports official communication channels in a less hierarchical manner;
- ❑ promotes teamwork and puts the organisation above any individual or group;
- ❑ ensures adequate and appropriate human and material resources;
- ❑ guarantees equal opportunity and professional development for various categories of employees;
- ❑ ensures transparency and accountability and
- ❑ monitor functions or keeps track of progress for continuous performance improvement.

From the foregoing, the implementation conditions identified for the LRCI are discussed in the subsequent sections.

6.4.1. Revision of the Land Use Act

The power of to dispose of interest in land or property should be an exclusive right of the people. Under the LUA, the occupier does not have this power. The Act prohibits the alienation of a right of occupancy without prior consent of the State Governor. Independent, voluntary and absolute transfer of title and possession of real property from one person to another (the power of alienation) is an essential ingredient of ownership and a condition for growth of property market. Transfer, sublease, mortgage, etc are major rights of the citizens grossly undermined by the LUA and this has been the major basis of calls for the revision of the Act. The current Minister of Housing and Urban Development in Nigeria, Mrs. Mobolaji Osomo has emphasised the need to revise the Act to do *“away with the area of consent once you know that a property is yours”* (TD, 2004). The Minister wants a situation which ensures that once a person (natural or non-natural) has a C. of O., the Federal Government can guarantee that the document and property belongs to the person, and the owner does not need any authorisation to carry out any transaction relating to the property. A major requirement for the implementation of the amendment suggested by the Minister is a public infrastructure for validating ownership by all the parties interested in a property, which is realisable through the single-window solution provided by the LRCI.

The restriction imposed on the court by virtue of section 47 of the LUA is another major concern. According to Nyiam (2002), the LUA *“would remain a source of discord by virtue of its being essentially not in accord with the tenets of 'Republican' and 'Democratic' Federalism which we have elected to adopt as a system of government.* The LUA suffers from the problem of its unacceptability. Firstly, it is an imposition by the military on a people who did not require such Act. Secondly, the Act is perceived as an indirect extension of elements of the feudal land tenure customs (which the North-West Fulani imperialists utilised to legitimise their compulsory take-over of the Hausa talakawas land) to the Middle Belt and Southern Nigerian zones, which had their own statutory and customary rights of occupancy. Thirdly, the LUA has served the interest of the wealthy and those in power, than the common man (Nyiam, 2002). The LUA disregards the constitution of the Federal Republic of Nigeria and gives a Governor an unlimited power that may be easily abused for political patronage and deprivation of the opposition.

The LUA mandates Governors to hold land in trust and administer it for the common use and common benefits of all Nigerians, but no Nigeria can walk to the Ministry of lands or a Governor and request for a parcel of land. If you would get one, it involves a lengthy procedure and you must be ready to pay heavily for the *‘common benefit’!* Without wasting time, it is clear that the Governor, except the *‘state’* land, has no land to give any Nigerian. The only achievement of the LUA is that it has succeeded in generating revenue for the government, because assignors or mortgagors of land must pay certain amount of money to the state purse before they can obtain consent to their transaction (Aluko, 2001).

The LUA should be revised to allow absolute ownership to meet the needs of the citizens and support the implementation of the LRCI. This will guarantee that the infrastructure does not inherit problems arising from the rules of the game and will enjoy the confidence of the people.

6.4.2. Seeking of political support

The major challenge here is to get the implementation of the infrastructure endorsed by politicians, policy makers and administrators (top managers in the civil service). The advantages of the LRCI in terms of efficiency, improved products and services, accountability, revenue generation, etc should be carefully explained. The support of politicians, policy makers and administrators is needed for the allocation of money and other resources to build and maintain the infrastructure and for the establishment of a semi-autonomous public agency for integrated cadastral and land registration services.

6.4.3. Cost recovery and PPP

The result of the research does not support a full divestiture of land registration and cadastral services to the private sector because of the legal requirements and confidence of the civil society. But, payment for services confers power. A case may be a total privatisation of LIServices provision, while the state retains monitoring and regulatory powers. But a full cost recovery status by a semi-autonomous bureau for integrated cadastral and land registration services will meet the implementation requirements of the LRCI and make politicians and service providers accountable to the customers.

The fundamental issues surrounding PPP have been discussed in section 2.4. The infrastructure will perform better if the organised private sector is involved in the delivery of Geo-ICT services under a genuine PPP arrangement executed in stages (negotiation / dialogue, consensus creation and preservation) and based on shared responsibilities, commitment, benefits and control of all the partners. Cadastral services may be offered under PPC, for example by contracting cadastral surveys and mapping to qualified surveyors.

6.4.4. Develop a technique for property tax management

One of the five harmonising LRCI funding options is taxes; a procedure of property tax administration must be identified to support funding of the infrastructure and improvement in government revenue through the single-window solution. The tax management process should start with an inventory of all properties and determination of those subject to taxation; this should be followed by valuation or appraisal of the properties and calculation of the amount of taxes. The property occupiers should be informed of their liability by sending tax bills to them for payment. This will remind them of their responsibility and facilitate the collection process.

6.4.5. Provision of enabling policies and legislations

In addition to the revision of the LUA, there is a need to provide new policies and regulation to support the infrastructure. The new legislations should incorporate:

- Mandatory registration of all transactions relating to mortgages by banks, insurance companies, and other private and public institutions for analysing revenue generation and developments in property markets, identification of problems and provision of solutions.
- Compulsory land registration to ensure that ownership rights are adequately recorded.
- Provision of land registration information to any interested person, upon the payment of the prescribed fee.

- Payment of interest on arrears of ground rent, property tax, etc and speedy trial of the defaulters to discourage the people from owing the taxes.

6.4.6. Combating unlawful activities and encourage uprightness

Unlawful activities may bring deterioration to the infrastructure and collapse from a functioning and economical state. The first step in the redressing of unlawful practices is to educate people on the effect of corruption on organisations, the people, present and future generations. Corruption devastates resources by turning government policy against the interests of the majority and away from its proper goals. It turns the energies and efforts of public officials and citizens towards easy money instead of productive activities. It hampers the growth of competitiveness, frustrates efforts to alleviate poverty and generates dispassion and distrust in the society (Eigen, 1998).

Dealing with corruption without identifying the causes of corruption is a mere cosmetic action that will never bring any meaningful result. It was identified during the fieldwork that widespread poverty and extended family relationship with the accompanying high number of dependant relatives is a major cause of corruption in Nigeria. Unfortunately, poverty alleviation programmes are at risk in corrupt societies. However, poverty reduction is a key step in corruption and integrity improvement initiatives. For example, poverty elimination is the overall aim of the UK Department for International Development's efforts to fight corruption (Tamesis, 1998).

Combating unlawful activities in LIService provision requires the support of civil society in investigating corruption matters, fostering greater participation of the customers in decision making and creation of efficient communication channels for customers to present their complains. This should be supported with an effective mechanism for investing cases of corruption and punishment of corrupt officials. The infrastructure will also require a malpractices monitoring mechanism, because bribery involves more than one party, there must be a 'giver' and a 'receiver'. The apparatus must monitor the two sides with a view to tracking corrupt officials and customers. The five major drivers of integrity improvement attainment in LIService delivery are portrayed in figure 6.12.

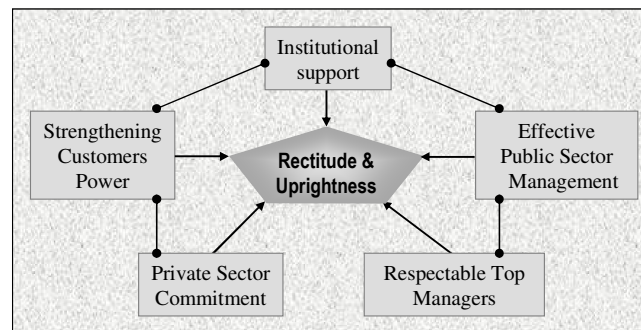


Figure 6-13 The drivers of integrity improvement for the LRCI

Eradication of corrupt practices in the implementation of the LRCI requires:

- effective public service management, since the infrastructure will operate within the public service and interact with civil servants in other government offices;
- respectable top managers to lead by examples;
- commitment of the private sector because they constitute the majority of regular users and will be involved in the running of significant part of the infrastructure (Geo-ICT and cadastral surveys);

- strengthening of customers power by involving them in decision making and integrity improvement programmes and
- institutional support to eliminate delays in the prosecution of suspects and use of existing government apparatus like ICPC and the State Security Service.

6.4.7. Geodetic control network and spatial data acquisition

Spatial data development for the LRCI requires a reliable geodetic framework. According to Nwilo (2003), the values of the coordinates of the Nigerian Geodetic Controls have not been fully worked out and adjusted using Least Squares Adjustment method to ensure internal consistency. Another important issue is whether Clarke 1880 as a computational surface is the best for Nigeria, in view of the fact that it is not geocentric and the point that the GPS techniques have transformed the methods of geodetic data collection, using the WGS 84 ellipsoid (Nwilo, 2003). Improvement in the availability of geodetic network can be achieved with GPS to support the easy survey of parcels of land, especially in urban areas where precise surveys may be required.

Spatial data acquisition for the LRCI will be facilitated by the following pertinent facts, most of which were pointed out by Molen and Lemmen (2004).

- Provision of geodetic network from GPS and positioning service established using Real Time Kinetics RTK-GPS.
- Abandonment of monumentation, because easy reconstruction is possible.
- The use of field sketches, probably based on orthophoto in which people can identify their properties.
- Replacement of tapes with cheap laser devices.
- Consideration of a change from national reference system to WGS/UTM
- Link to NGDI.
- Development of metadata to determine data suitability by users.

6.5. Concluding remarks

This chapter ensures that the LRCI meets or exceeds the customer needs, with the validated models and architecture. The first step was iterative validation of models and system architecture, followed by testing of the prototype with data (large scale cadastral map, documents and attributes) collected from the field, and qualitative review and judgments. The implementation is arranged in phases or stages to allow step-by-step monitoring and performance evaluation. The outcome of the evaluations will provide feedbacks for improvement. Performance evaluation becomes more important after the commissioning of the project; various approaches were suggested for measuring internal and external performance of the infrastructure. While the LRCI has sufficiently addressed the provision of a single-window access for ease of use of land and property-related information in Ondo State of Nigeria, the infrastructure will not operate in isolation. In view of this, institutional, technical and socio and economic conditions for implementation were specified based on the level of complexity that the LRCI will deal with.

7. Conclusions and recommendations

7.1. Summary

The challenge of ensuring improvement in the delivery of land registration and cadastral services or LIServices will soon become more visible in Nigeria. This statement is anchored on three main considerations. First, the customers are increasingly becoming dissatisfied with the present situation and want better services and LIService providers are now more conscious than ever of the need to improve the quality of products and services that they deliver to the society. The second point which is closely related to the first is the commitment of the federal government to provide more shelter for the people at reasonable prices and sustainable level, and overhaul the urban centres. The Federal Ministry of Housing and Urban Development has emphasised the need for amendment of the LUA so that it becomes compulsory for land to be registered and outright removal of area of consent, once a property is registered. This will bring unparalleled growth into the property market because it will support people to acquire land and mortgage to build or buy their own houses. It will also deter extralegal property market. The third argument comes from the use of wireless and satellite communication technology to bypass the deplorable condition of the communication industry and deregulation of the industry to allow private sector participation. This step has greatly improved the telecommunication situation in Nigeria and the Internet industry is booming. At the same time, the government is developing policies and strategies to support e-governance and e-commerce. As soon as the society becomes more accustomed with the Internet and recognise the advantages of electronic submission of requests and processing of LIServices, the LIService providers will be faced with the challenges of e-LIServices and operation expansion.

This thesis looks at these 3 considerations and other important issues relating to the primary aim and objectives of the research from LI management perspectives. Relevant policies in Nigeria were reviewed and a theoretical framework was provided for the study. The South African success in LIService provision was cited as an example of a good practice in Africa. Organisational issues and changing institutional arrangements in LI provision, PPP and PPC were discussed. Facts or data were gathered from the study area to give a clear understanding of the present situation. The current circumstances were analysed and modelled, and the desired future was determined from users' requirements and use of the appropriate technology. Strategies and actions were provided to bridge the gap between the current situation and the desired future.

A system referred to LRCI was developed from tested models and validated architecture. The USC is the 'doorway' of the infrastructure and provides one-stop solution, which is the main objective of the research. Five harmonising funding solutions were proposed for the LRCI. The guidelines and conditions for the implementation of the infrastructure were presented in the sixth chapter. This chapter highlights the major findings and limitations of the research, with discussions on issues for future consideration and further research. A review of the outcome of the research provides the recommendations that bring the thesis to a close.

7.2. Conclusions

The foremost findings and conclusions that may be drawn from the research are:

- ❑ There are 2 providers of LIServices in Ondo State, they are MWLH and OSDPC. The majority of cadastral and land registration activities and indeed the most important aspects take place in the MWLH. The OSDPC is a major LIService user and may not be involved in LIService provision. All the production processes, products and services are fully analogue typified by repetitive tasks, without time registration and sufficient quality control measures. The MWLH has a strong interest and inclination towards digital production line, but obviously does not yet have the resources (people and technology) for digital LIService provision.
- ❑ Private enterprises are the major users of land registration and cadastral information. They are referred to as regular users in this thesis. There is no formal co-operation among the regular users and the ad hoc users. There is inadequate formal linkage and no collaborative efforts can be recognised between the core producer of LIServices and other governmental and private agencies.
- ❑ The users want to receive products and services in analogue and digital formats. But almost all the users are not interested in online LIServices, at least for now.
- ❑ Accurate prediction of customers needs is difficult without thorough users' requirements survey and analysis. Knowledge of available technology and access to the technology is a key determinant of customers' requirements and expectations.
- ❑ It is impracticable to have a universally applicable solution in the development of land administration systems. The applicability of a system will not just depend on availability of technology, but users' awareness of a technology. Other factors that determine applicability are property related formal and informal institutions.
- ❑ A single-window solution will not guarantee improvement in the funding of the LRCI without a change in the status of the MWLH and review of some laws, regulations and policies. The one-stop solution will definitely enhance government revenue from land and make the system more transparent through the inbuilt control mechanisms.
- ❑ The research revealed that both regular and ad hoc users are willing to pay more for improved products and services. While ad hoc users are willing to pay as much as twice the present fees, the regular users want to see the level of improvement before deciding on a corresponding price increase. Whatever the case may be, regular users are not willing to pay more than 20% of what they are currently paying.
- ❑ The functionality and sustainability of the proposed system is closely dependent on business process reengineering, with sufficient attention to eradication of unlawful activities and integrity improvement measures.
- ❑ Full privatisation of LIServices will not be acceptable and receive the support of the majority of the citizens, but genuine partnership with the private sector by a semi-autonomous public agency will be supported by majority of the users and stakeholders.

- The USC provides a single window access to facilitate the availability to land information for diversified functions. The prototype was tested for some regularly required functions, with factors that will facilitate profitable functioning and delivery of good quality services and products by the LRCI discussed in section 6.4 as conditions for implementation.

7.3. Limitations of the research

The major limitation of the research is non-availability of official and authoritative information on fees and taxes. The figures obtained during the fieldwork were based on interview and surveys. There is no official publication on fees payable for products and services, and government earnings from land and property related taxes. It makes it difficult to model and predict the level of step-up in government revenue that the single point of contact would bring. Another limitation of the research is time, the fieldwork, though intensive could have been more complete with wider coverage. Random sampling was used to select the users in a stratified manner. This type of selection of respondents can be expected to produce samples that are not sufficiently representative of the users in Ondo State.

The prototype was built and tested using a hybrid approach. Since the models and data are already available in digital format, another prototype implemented with the en-suite solution would have given the opportunity for comparing the hybrid approach with the en-suite approach. This was not possible because of non-availability of the relevant software. The normal fact that the research has to end at a point in time brings another limitation in the building of the scaled-down version of the desired information system. The iterative process should continue with modifications until the actual system is installed.

These limitations were addressed using multiple sources of evidence in a corroborative manner. A threshold was set, and non-conforming observations were rejected. The workshop was attended by most sectors of the user communities and stakeholders; input from discussions of the workshop has scaled down the problems related to sampling and use of questionnaires for data collection. A prototype of the desired information system was built on an adaptable and scalable architecture that can be easily modified for improvement. The continuous contacts with users and discussions with experienced experts and colleagues throughout the period of the research will make the effect of discontinuation of the iterative process and modifications till the actual system is installed negligible.

7.4. Issues for future consideration and further research

The following issues are imminent in the study area and are worthy of consideration for the future:

- Electronic submission and registration of documents to permit surveyors and lawyers to submit documents digitally or electronically.
- Realisation of electronic delivery of LIServices in Ondo State.
- Inter-organisational workflow: connectivity with external data sets, such as BIR information on taxes, Electricity Board, Waste Management Board, Water Corporation, Environment and Mineral Resources, Water and Sanitation Project and OSDPC.

Further research in the areas listed below will fill gaps, be an improvement on the research and opportunity for a focussed contribution to knowledge.

- ❑ The associations or relationships between the grade of LIServices and quality of governance in a country.
- ❑ Technological growth and LIService customers' expectation.
- ❑ Determination of acceptable prices (to customers and provider) of LI products and services.
- ❑ Quantification and modelling of economic gains derivable from improvement in the delivery of LIServices and loss caused by inefficient services.

7.5. Recommendations

Putting together all the findings of the research and looking into the future, one may derive additional course of actions or accentuate important considerations in ensuring that land registration and cadastral information is obtainable when needed. For this reason, the final issues that require careful attention are presented in the succeeding paragraphs.

- (i) **Implementation task force:** A task force will be required to develop the business plan and implementation strategy, and work on other recommendations for smooth transition from the current situation to the desired future. The membership of the task force should include experts in Geo-ICT, organisational change, public relations, finance and business management. The implementation task force will also ensure the execution of a pilot project that will be incorporated into the final implementation. The task force will also ensure the continuous modifications and updating of the pilot project until the actual system is fully installed. This will allow the internal users within the MWLH to make changes in the system to improve their work and the external users or customers to evaluate the pilot project with respect to their requirements.
- (ii) **Capability development:** Building organisational capacity should be seen from at least five perspectives. These are human resources development, acquisition of appropriate equipment and improvement of communication channels, creation of a semi autonomous public enterprise (institutional) and cultural reorientation (organisational).
 - ❑ **Human resources development:** A production focussed training approach implemented at three levels is recommended for human resources development. The training may start at the 'strategic level' for top managers that will take decisions and champion the implementation, followed by training at a 'tactical level' for middle managers to be able to implement and manage information systems and develop business applications, new products and services. The third level will be at the 'operational level' for daily operations and maintenance of the system e.g. data entry and modification, handling and maintenance of equipment, etc. The human resources development must include the recruitment of competent IT personnel, economist / marketers in a transparent manner and incorporate continuous training and retraining. The number of staff required to provide services at the USC has to be adequately determined based on the expected workload. This is necessary to reduce waiting or queuing time for services.
 - ❑ **Acquisition of appropriate equipment:** The thesis has emphasised the need to base acquisition of equipment (hardware, software and others) on requirements and local

conditions. It may not be necessary to buy all the equipment required. The estimated duration of use and extent of use within the period are very important. The execution of activities requiring less use of a software or hardware may be carried out in other establishments where the required equipment is available or through direct outsourcing. The approximate lifespan of equipment should be well considered in relation to its obsolescence as imminent in phase of the present-day rapid advancement in Geo-ICT. Hence, the estimated cost of hardware and software must go beyond the actual cost price to include, delivery and installation, maintenance and upgrading costs. These information are usually available from equipment vendors for comparison, before taking final decision.

- **Improvement of communication channels:** The means of communication or access to the infrastructure by customers or users within and outside the agency is very important. While intranet and intercom are recommended for internal communication, communication channels with external users has to be widened beyond available postal system. The meeting of performance target such as, confirmation C. of O. to financial institutions within 5 working days, from any location in Nigeria will require partnership with private speed post service providers. Limited customers' services such as provision of application forms, description of processes, request for information, complains, explanation of pricing policy and publication of fees may be provided on the Internet via the Ondo State Website (www.ondostategovernment.com). Enhanced communication channels and clear pricing have been established as major drivers of customers' satisfaction. Regular assessment of customers' satisfaction is recommended for performance upgrading and enhancement of image / reputation of the agency.
- **Creation of semi autonomous agency with customer orientation:** The creation of a semi autonomous public enterprise for LIService provision will produce a public monopoly which is inevitable from the evidence collected in the field. The public agency should not be profit-oriented, but funded by market with an ultimate target of full cost recovery to initiate full market-driven customer orientation, which is necessary for customers' satisfaction and accountability of the agency to the customers. This has to be supported with policies that will make the service provider more efficient and customer-focussed. Examples of such policies in other countries are the Citizen's Charter of the British Government and USA Executive Order 12862 (Setting Customer Service Standards). The agency must have clear vision and mission, and formulate goals with performance measures.
- **Align cultural values of employees with organisational goals:** Cultural reorientation within the agency is likely to be the most clumsy to implement and difficult to measure recommendation. It may be complex, but the way of life and moral principles of the employee have to match the organisational goals, because it is the connective tissue that binds together the agency, including shared values and practices, behaviour norms, and most important, the agency's orientation towards performance. The values have to change from the protective nature of the civil service to productive disposition, and the top managers should build the culture of playing the role of leaders, encourage teamwork, accountability and transparency.

- (iii.) **External data storage:** The starting point of data protection through external storage will be by physical transfer of data on tapes to another organisation on agreement. The future will be to have an external network or wide area network based on wireless connection (through a local internet service provider) to an external server for external storage of data. As soon as the agency becomes fully connected to the Internet, the 'tunnel' principle may be used to create within the internet a secured line for external storage of data in an external server. A broad band connection is recommended for this potential solution with sufficient protection or encryption to prevent unintended recipients from reading that data.

References

- Acaster, M. and Oglesby, M., 2004. Successful Delivery Toolkit: Continuous Improvement. Office of Government Commerce, Rosebery Court, St. Andrews Business Park, Norwich, U.K.
- Akingbade, A. and Lemmen, C., 2004. Geospatial Data Infrastructure for Nigeria: Foundation for Further Development, GIM International, pp. 12 -15.
- Akpoyaware, A.O., 2003. Towards Improved Cadastral Services from Federal Ministry of Works and Housing, Nigeria (A scenario for change). Unpublished M. Sc. thesis Thesis, International Institute of Geo-Information Science and Earth Observation (ITC), The Netherlands., Enschede.
- Aluko, O., 2001. The Law of Real Property and Procedure in Nigeria. Bright Star Law Series. Brighter Star Publishers Nigeria Limited, Ibadan, Nigeria.
- BBC, 2003. What are Public Private Partnerships? BBC News Online: (<http://news.bbc.co.uk/>), London, United Kingdom.
- Berg, A.v.d., 2004. ADVANCED SPATIAL DATA SYSTEM FOR THE CHIEF SURVEYOR-GENERAL. The Chief Surveyor-General of Republic of South Africa (<http://csg.dla.gov.za/press.htm>), Accessed 14 September 2004), Pretoria, South Africa.
- Berwick, Godfrey and Roessner, 1991. Curing Health Care.
- BPE, 2003. Privatisation Policy. Bureau of Public Enterprises (BPE), The Presidency, 1 Osun Crescent Maitama,, Abuja, Nigeria.
- CARIS, 2003. caris LIN: The solution to the complexities of managing land ownership. CARIS, Canada (www.caris.com). Fredericton, New Brunswick.
- CCPPP, 2004. About PPP: Definitions, Models, Why Choose PPP's? The Canadian Council for Public-Private Partnerships (<http://www.pppcouncil.ca/>) 40 King Street West, Scotia Plaza, Suite 5800, Toronto, Ontario, Canada.
- Conrad, T.H.-W. and Nga-Fong, C., 2002. Hong Kong Cadastral Survey System: A comparison and its implementation. GISdevelopment.net.
- Crompvoets, 2000. PhD Project Proposal (Full) - WAGENINGEN UNIVERSITY, Wageningwn, The Netherlands.
- Dale, P. and McLaughlin, J., 1999. Land Administration. Oxford University Press Inc., New York, 169 pp.
- Dale, P.F. and McLaughlin, J.D., 1988. Land Information Management - An introduction with special reference to cadastral problems in The Third World Countries. Oxford University Press, New York, 266 pp.
- DLA, 1997. REGULATIONS PROMULGATED IN TERMS OF SECTION 10 OF THE LAND SURVEY ACT, 1997 (ACT No. 8 OF 1997). Department of Land Affairs (DLA), Ministry of Agriculture and Land Affairs, Old Building, 184 Jacob Marè Street -http://csg.dla.gov.za/act8_97.htm - Accessed 15 September 2004, Pretoria, South Africa.
- DLA, 2004a. Deeds Registration. Department of Land Affairs (DLA), Ministry of Agriculture and Land Affairs, Old Building, 184 Jacob Marè Street, Pretoria, South Africa.
- DLA, 2004b. Land Planning & Information - Cadastral Surveys (SURVEYOR-GENERAL). Department of Land Affairs (DLA), Ministry Of Agriculture and Land Affairs, Old Building, 184 Jacob Marè Street, Pretoria, South Africa.
- Eigen, P., 1998. Corruption & Integrity Improvement Initiatives in Developing Countries: Message from Transparency International. United Nations Development Programme (UNDP), New York, USA.
- Ellis, C.D., Quiroga, C., Shin, S.Y. and Pina, R.J., 2003. GIS and Human-centred Systems Design: Using Ethnographic Data Collection and Analysis Methods to Design a Utility and Analysis Methods to Design a Utility Permitting Support System. Journal of the Urban and Regional Information Systems Association (URISA Journal), Vol. 15, No. 2(2003): 5 - 22.
- ESRI, 2004a. GIS Dictionary. Environmental Systems Research Institute(ESRI), Support Center, USA (<http://support.esri.com/>). Redlands, California.
- ESRI, 2004b. National Cadastre Data Model. Environmental Systems Research Institute (ESRI), USA, Redlands, California.

- ESRI, 2005. ArcGIS data types. Environmental Systems Research Institute (ESRI), USA, Redlands, California.
- Fajemirokun, B., 2002. Land and Resource Rights: Issues of Public Participation and Access to Land in Nigeria, First Workshop of the Pan-African Programme on Land and Resource Rights (PAPLRR), Cairo, Egypt.
- FGN, 2001a. National Space Policy. Official Website of the Office of Public Communications, State House, Federal Government of Nigeria (FGN), Abuja, Nigeria.
- FGN, 2001b. Nigerian National Policy for Information Technology (IT). Official Website of the Office of Public Communications, State House, Federal Government of Nigeria (FGN), Abuja, Nigeria.
- FGN, 2004. The Nigersat-1 Project. Presidential Research & Communication Unit - Government in Action, Abuja, Nigeria.
- FMST, 2003. National Geoinformation Policy, FEDERAL MINISTRY OF SCIENCE AND TECHNOLOGY (FMST), Abuja, Nigeria.
- Fourie, C., Molen, P.v.d.M. and Groot, R., 2002. Land Management, Land Administration and Geospatial Data: Exploring the Conceptual Linkages in the Developing World. *GEOMATICA*, 56(4): 351 - 361.
- Grant, D.B., 2004. Cadastral automation and related e-government initiatives in New Zealand. In: G. Schennach (Editor), International Federation of Surveyors (FIG) International Conference. Austrian Society for Surveying and Geoinformation (OVG), Innsbruck, Austria.
- Groenendijk, E.M.C., 2003. Planning and Management Tools: A reference book (ITC Special Lecture Notes Series). The International Institute for Geo-Information and Earth Observation (ITC), Enschede, The Netherlands.
- Groot, R. and McLaughlin, J., 2000. Introduction. In: R. Groot and J. McLaughlin (Editors), *Geospatial data infrastructure: Concepts, cases, and good practice*. Oxford University Press Inc., New York, USA, pp. 1-12.
- GSDI, 2001. Global Spatial Data Infrastructure Newsletter. GSDI Association.
- Haynes, P. and White, J., 1999. A Fundamental Rethinking of Customer Service in Local Government: *e-business and best practices combine to deliver advanced customer care solutions that improve relationship with City Hall*. JPH International Inc., Canada, Waterloo, Ontario.
- Helikarová, K., 2004. Policy of the Government of the Czech Republic concerning Public Private Partnership. Ministry of Finance of the Czech Republic (<http://www.mfcr.cz/>), Prague.
- ILS, 2002. LAND REGISTER by LIS (White paper). International Land Systems (ILS) Inc, USA (http://www.landsystems.com/Company_Profile/LandRegister_white_papers_international.pdf). Silver Spring.
- Intergraph, 2004. GeoMedia Professional: About GeoMedia Professional. Intergraph Corporation, Madison, United States.
- ITC, 2000. Performance Analysis and simulation modelling, International Institute for Geo-Information Science and Earth Observation, Geoinformatics Management and Infrastructure (GMI) Division, Enschede, The Netherlands.
- Kadaster, 2000. Land: the foundation of our existence, Kadaster International, Apeldoorn.
- Kaufmann, J. and Steudler, D., 1998. Cadastre 2014: A VISION FOR A FUTURE CADASTRAL SYSTEM. International Federation of Surveyors (FIG) Commission 7 - Cadastre and Land Management.
- Kufoniyi, O., 2004a. Comments made during workshop on: "improvement of availability of Land registration and cadastral information in Ondo, State, Nigeria" - 16 November 2004. ITC, M.Sc. Research Fieldwork, Ile-Ife, Nigeria.
- Kufoniyi, O., 2004b. National Geo-information Policy (NGP) of Nigeria - Electronic Conversation / Email, Ile-Ife, Nigeria.
- Lantmateriet, 2003. ArcCadastré: The next-generation software for cadastral and mapping applications. Lantmateriet (www.arccadastre.com) National Land Survey of Sweden, GÄVLE, SWEDEN.
- Magis, M.C.D., 2002. Customer Demand and Feedback: an outline of the Cadastre organisation, customer expectations, customer satisfaction, United Nations Economic Commission for Europe (Working Party on Land Administration), Vienna, Austria.

- Man, W.H.E.d. and Toorn, W.H.v.d., 2002. Culture and the adoption and use of GIS within organisations. *International Journal of Applied Earth Observation and Geoinformation*, 4 (2002): 51-63.
- Meijere, J.d., 2004. Verbal discussion of research proposal.
- Microsoft, 2004. Visio 2003 Help. Microsoft Corporation, USA.
- Molen, P.v.d., 2002. The dynamic aspect of land administration: an often-forgotten component in system design. *Computers, Environment and Urban Systems*(26 (2002)): 361 - 381.
- Molen, P.v.d., 2003. Six Proven Models for Change, International Federation of Surveyors (FIG) Working Week 2003, April 13 - 17, Paris, France.
- Molen, P.v.d. and Lemmen, C., 2004. Unconventional approaches to land administration: *A point of view of land registrars and land surveyors*, FIG HABITAT ISK CASLE Expert Group Meeting on Secure Land Tenure : New Legal Frameworks and Tools. OICRF, Apeldoorn, The Netherlands (<http://www.oicrf.org/>). Nairobi, Kenya.
- Morales, J., 2005. Spatial Information Management: an integrated approach, based on ArcCadastré, ITC GIM 2/3 - 2004/2005 - System Architectures for Geoinformation Services Provision, Enschede, The Netherlands.
- Morales, J.M., 2004. Model-Driven Design of Geo-information Services. International Institute for Geo-information and Earth Observation (ITC) & CIIT, Enschede, The Netherlands, 200 pp.
- NCPPP, 2003. CRITICAL CHOICES: The Debate over Public-Private Partnerships and what it means for America's future. National Council for Public-Private Partnerships 1660 L Street, NW Suite 510 (www.ncppp.org), Washington, USA.
- North, D.C., 1990. Institutions, Institutional Change and Economic Performance. Cambridge University Press, Cambridge, United Kingdom, 152 pp.
- NRC, 1994. Promoting the National Spatial Data Infrastructure Through Partnerships. National Academy Press, Washington, D.C., 113 pp.
- Nwilo, P.C., 2003. The Role of Spatial Reference System Framework and Fundamental Data Sets in National Geospatial data Infrastructure (NGDI), National Geospatial Data Infrastructure Stakeholders / Users Workshop. National Space Research and Development Agency (NASRDA), Abuja, Nigeria.
- Nyam, T., 2002. TOWARDS A BETTER NIGERIA, Integrative National Conference on Sharia, Resource Control and Anti-terrorism in Nigeria organised by the Faculty of Arts, University of Lagos. University of Lagos, Lagos, Nigeria.
- ODSG, 2004. MINISTRY OF SPECIAL DUTIES: Ondo State Development and Property Corporation (OSDPC). Information Communication Technology Centre, Office of the Governor of Ondo State, Obafemi Awolowo Way, Alagbaka, Akure. Nigeria.
- Oliver, R.L., 1994. A cognitive model of the antecedents and consequences of satisfaction decisions. *Journal of Marketing Research*(17): 460 - 469.
- OS, 2004. Ordnance Survey: Championing innovation and technology. Ordnance Survey (OS) - <http://www.ordnancesurvey.co.uk/>, Southampton, UK.
- Paresi, C.M., 2003. (Total) Quality Management Standards, models and practices, Geo-Information Management Module 11: Organisational Development teaching materials Part 2 of 2, May 2004. International Institute for Geo-Information and Earth Observation (ITC), Enschede, The Netherlands.
- Paresi, C.M., 2005. Development of an improved system (Discussion on thesis). In: A. Akingbade (Editor). Unpublished, Enschede, The Netherlands.
- Paresi, C.M.J., 2004. Lectures and discussions in ITC GIM Module 11: Organisational Development. In: A. Akingbade (Editor). Unpublished, Enschede, The Netherlands.
- Peng, Z.-R. and Tsou, M.-H., 2003. INTERNET GIS - Distributed Geographic Information Services for the Internet and Wireless Networks. John Wiley & Sons, Inc., Hoboken, New Jersey, USA, 679 pp.
- Radwan, M.M., 2004a. Geo-Data Infrastructure 'GDI' Concepts: Part 1: Re-engineering of Information system in GI organizations, ITC GIM2/3 2003-2004; Module 6 Lecture Slides. International Institute of Geo-Information Science and Earth Observation (ITC), The Netherlands., Enschede.

- Radwan, M.M., 2004b. Geo-Data Infrastructure 'GDI' Concepts: Part 1: Re-engineering of Information system in GI organizations, ITC GIM2/3 2003-2004: Module 6 Lecture Slides, Enschede, The Netherlands.
- Radwan, M.M., Onchaga, R. and Morales, J., 2001. A Structural Approach to the Management and Optimisation of Geoinformation Processes, EOEPR.
- Reeve, D.E. and Petch, J.R., 1999. GIS, Organisations and People - A Socio-technical Approach. Taylor & Francis Ltd, London and USA.
- Reichheld, F.F., 1996. The Loyalty Effect: The Hidden Force Behind Growth, Profits, and Lasting Value. Boston, MA - Harvard Business School Press.
- Riley, J.M. and Riley, G.B., 2004. Strategy - SWOT ANALYSIS. Tutor2u Limited, 19 Westwood Way, Boston Spa, WETHERBY, LS23 6DX.
- Sambura, A., 2004. e-Land administration in Accession Countries - Experience in Poland. In: G. Schennach (Editor), International Federation of Surveyors (FIG) International Conference. Austrian Society for Surveying and Geoinformation (OVG), Innsbruck, Austria, pp. 79 - 87.
- Sanni, R.M., 1998. Dynamic Modelling in the re-engineering of Geo-Information Production Processes, International Institute of Geo-Information Science and Earth Observation (ITC), The Netherlands, Enschede.
- Satmetrix, 2001. Measuring Customer Loyalty - A Satmetrix Systems White paper, Satmetrix Systems, Inc., Mountain View, CA 94041, USA.
- Sholiyi, O., 2003. NigeriaSat-1 PowerPoint Presentation. National Space Research and Development Agency (NASRDA), Abuja, Nigeria.
- Soto, H.d., 2000. The mystery of capital: why capitalism triumphs in the West and fails everywhere else. Basic Books, A Member of the Perseus Books Group, New York, USA.
- Tamesis, P., 1998. Corruption & Integrity Improvement Initiatives in Developing Countries: Different Perspectives of International Development organisations in the Fight of Corruption. United Nations Development Programme (UNDP), New York, USA.
- TD, 2004. Nigeria; Housing Ministry Wants Land Use Act Amended. This Day (TD), Africa News / Fannie Mae Foundation, Inc.
- Tuladhar, A.M., 2003. Why is Unified Modelling Language (UML) for Cadastral Systems? Geo-Data Infrastructure (GDI) Concepts, ITC GIM 2003 Module 6.
- Tuladhar, A.M., 2004. ITC GIM Module 14: Models for Land Administration Options Lecture. In: I.G.M.E. Participants (Editor). Unpublished, Enschede, The Netherlands.
- Tuladhar, A.M., Molen, P.v.d. and Lemmen, C., 2004. Lectures and discussions in ITC GIM Module 14: Advanced concepts in Land Administration. Unpublished, Enschede, The Netherlands.
- UNECE, 1996. Land Administration Guidelines with special reference to countries in Transition (ECE/HPB/96), United Nations Economic Commission for Europe (UNECE), New York and Geneva.
- Vries, W.T.d., 2004. Public administration reform, outsourcing, privatization (ITC GIM Module 5, Lecture 12 PowerPoint Presentation). Unpublished, ITC, Enschede, The Netherlands.
- Webb, R. and Pulle, B., 2002. Economics, Commerce and Industrial Relations Group. Parliament of Australia, Parliamentary Library, Parliament House, Canberra, Australia.
- Williamson, I., 2003. SDIs - Setting the Scene. In: I. Williamson, A. Rajabifard and M.-E.F. Feeney (Editors), Developing Spatial Data Infrastructures: From Concept to Reality. Taylor & Francis, London & New York, pp. 3 - 16.
- Yin, R.K., 1994. Case study research - design and methods. Applied Social Research Methods Series, 5. Sage publications, Inc., London.

Glossary of terms

These are explanations of words and combination of words used in the thesis. The glossary is derived and compiled from various sources such as Dale and McLaughlin (1999), ESRI GIS Dictionary, Hyper Dictionary (<http://www.hyperdictionary.com/>) and LUA.

Adaptable:	Quality of being made suitable for different kinds of application or use. For any system to be successful it must be adaptable or flexible to accommodate the dynamic nature of users' requirements.
Adjudication:	This is a procedure whereby the ownership and rights in land are officially determined. It a process of ' <i>pronouncing judgment based on the facts, evidence or proof presented</i> '.
Advocate:	A lawyer who pleads cases in court.
Alienation:	The power of an owner to dispose of interest in land or property. Under the LUA, the occupier does not have this power. The Act prohibits the alienation of a right of occupancy without prior consent of the State Governor. Independent, voluntary and absolute transfer of title and possession of real property from one person to another (the power of alienation) is an essential ingredient of ownership and a panacea for growth of land and property market. Part IV of the LUA (Alienation and Surrender of Rights of Occupancy) has been seen by many Nigerians as a major shortfall of the Act and a major standpoint for the need for the review of the Decree.
All-in-one fee:	This is a combination of all fees into a single fee, payable only once. It is the summation of all prescribed fees presently paid at different points. The all-in-one fee is payable as soon as charting is confirmed okay.
Appraisal:	Estimating the market value of property.
Assessment:	Determining the tax level for a property based upon its relative market value.
Assignment:	The instrument by which a property is transferred from one person to another, e.g. transfer of property by deed of conveyance. Normally, it is a transfer of title or interest by writing , as in lease, bond, note, or bill of exchange. It may be a transfer of the whole of some particular estate or interest in lands.
Attorney:	A professional person authorised to practice law; conducts lawsuits or gives legal advice.
Availability:	The quality of being at hand when needed.
Big bosses:	Senior employees or executives that are score-keepers rather than being leaders. They exercise control over workers and does not see the other employees as partners in achieving the goals / objectives of an organisation.
Cardinality:	This is a relationship between objects in a database, which describes the number of objects of one type that are associated with objects of another type. A relationship can have a cardinality of one-to-one, one-to-many, many-to-one, or many-to-many.
Charting:	Charting may generally be described as the use of graphs and charts in technical analysis. Charting in this thesis refers to the process of registering the coordinates of a surveyed land or property on a master plan or base map to determine if the plot as surveyed falls within allowable limits to on its location in space. The process is useful in ensuring that properties are well surveyed and one parcel of land is not registered twice.
Content Management:	Content management involves the organising, categorising, and structuring information resources so that they can be stored, published, and reused in multiple ways. A content management system (CMS) is used to collect, manage, and publish content, storing the content either as components or whole documents, while maintaining the links between components. It may also provide for content revision control (http://www.xinformodel.com/glossary.html).
Corruption:	A general definition of corruption is the misappropriation of public assets or public

	office/trust for private gains. This definition sufficiently covers most forms of corruption in both the private and public sectors. Combating corruption is a key indicator of commitment to good governance.
DXF:	Abbreviation of Data Exchange File, a two-dimensional graphics file format supported by virtually all personal computer based CAD products. It was created by Autodesk for the AutoCAD software (http://www.companionsoftware.com/).
Effective:	A system is effective when it is capable of producing or it is producing an intended result or desired results.
Effectiveness:	A measure of output conformance to specified characteristics. This is in fact the extent to which the output meets customers' requirements. Customer satisfaction is a critical measure of effectiveness.
Efficiency:	This is a measure of the relationship of output to inputs, may be expressed as a ratio of output to input. If we take the unit cost of a LI product like C. of O. as a performance measure, the total cost of production divided by the number of certificates issued will indicate the efficiency of the production system.
Efficient:	A system is efficient when it is producing the desired results without wasting effort, energy or money (saves resources).
Egunje:	This is a slang generally used to describe illegal facilitation money. To be more specific it is a bribe.
EMF:	Abbreviation of <i>Enhanced Metafile</i> , a 32-bit metafile that can be used by Windows 95, 98 and NT to display a picture. An enhanced metafile can contain a much broader variety of commands than a "regular" Windows metafile. Basically, the enhanced metafile format is a 32-bit super-set of the 16-bit Windows metafile format (http://www.companionsoftware.com/).
En-suite approach:	An approach identified for the research involving the use of integrated or single software that provides the functionalities of all the software combined under the hybrid approach used for the building of the prototype.
Feature Dataset:	A collection of feature classes stored together that share the same spatial reference; that is, they have the same coordinate system, and their features fall within a common geographic area. Feature classes with different geometry types may be stored in a feature dataset.
Foreign key:	A column or combinations of columns in one table whose values match the primary key in another table. A value in the foreign key can only exist if there is a corresponding value in the primary key, unless the value is NULL. Foreign key–primary key relationships define a relational join.
Grant:	A general word to describe the transfer of property whereby rights pass from the “ <i>grantor</i> ” to the “ <i>grantee</i> ”.
Grantee:	The person to whom a grant or conveyance (assignment) is made.
Grantor:	The person by whom a grant or conveyance (assignment) is made.
Hybrid approach:	An approach used in the research involving the combination and use of more than one software in the building of the prototype.
In-person:	Physical presence of a customer at the reception desk of the USC. An appearance carried out personally by a natural person or representative of a non-natural person.
Lessee:	A tenant who holds a lease.
Lessor:	Someone who grants a lease.
Metadata:	Information about the content, quality, condition, and other characteristics of data. Metadata for geographic data may document its subject matter; how, when, where, and by whom the data was collected; accuracy of the data; availability and distribution information; its

	projection, scale, resolution, and accuracy; and its reliability with regard to some standard. Metadata consists of properties and documentation. Properties are derived from the data source (for example, the coordinate system and projection of the data), while documentation is entered by a person (for example, keywords used to describe the data) (ESRI, 2004a).
Mirror:	Something that faithfully reflects or gives a true picture of something else, e.g. the exact duplicate of a server or database.
Mortgage:	A legal document that pledges a property to a lender (or mortgagee) as security for payment of a debt or loan.
Mortgagee:	The party or person that accepts a mortgage. For example, a bank became our mortgagee when the bank accepted our mortgage on our new house.
Mortgagor:	The party or person who gives a mortgage in return for money to be repaid. For example, one became a mortgagor when the bank accepted one's mortgage and loaned one the money to buy our new house.
Notary:	A lawyer empowered (legally) to witness signatures and certify a document's validity and to take depositions. Such lawyer is usually referred to as Notary public.
Obsolescence:	The process of becoming obsolete; falling into disuse or becoming out of date. It is an important consideration in acquisition of equipment: hardware, software, etc.
Optimal price:	The price of a LIService that is considered by customers as not excessive or immoderate, i.e. it is proper and within due limits. It may be described as a reasonable price for the consumers and not an overgenerous price on the side of the service provider.
Primary key:	A column or set of columns in a database that uniquely identifies each record. A primary key allows no duplicate values and cannot be NULL.
Quacks:	Unqualified or unauthorised persons criminally involved in the delivery of professional services such as land surveying.
Scalable:	Capable of being scaled up or down (rising or downward possibilities).
Solicitor:	A lawyer who gives legal advice and prepares legal documents.
Transferee:	Someone to whom a title or property is conveyed.
Transferor:	Someone who conveys a title or property to another.
Transparency:	Transparency may be broadly defined as public access to knowledge of the policies and strategies of government. Among other things, it involves making public accounts verifiable, providing for public participation in government policymaking and implementation, and allowing contestation over decisions impacting on the lives of citizens. It also includes making available for public scrutiny accurate and timely information on economic, financial and market conditions.
WMF:	Abbreviation of <i>Windows Metafile</i> , a 16-bit metafile that can be used by Windows 3.x, Windows 95, 98 and Windows NT to display a picture (http://www.companionsoftware.com/).
Workflow:	A workflow in ArcCadastre is a description of the process that is to be carried out. The workflow supports; steers and/or constrains the user to follow set rules and routines. Conditions must be satisfied in order that a process can be carried out. The workflow guarantees that legal processes or requirements of ISO certification are followed in the production process. The progress of the work can be followed on a diagram (Lantmäteriet, 2003).

Appendices

Appendix 1: Cadastral and Land Registration Services in South Africa

The Republic of South Africa (RSA) uses a land registration system involving an official recording of rights in land through deeds. The deed registration is decentralised and carried out by the Department of Land Affairs through nine Deeds offices in Pretoria, Cape Town, Johannesburg, Pietermaritzburg, Bloemfontein, Kimberley, King William's Town, Vryburg and Umtata. A 'diagram' showing the exact location of land and approved by the Surveyor General's Office (SGO) is required for registration. According to the RSA's Act No. 8 of 1997: Land Survey Act, 1997, a diagram means "*a document containing geometrical, numerical and verbal representations of a piece of land, line, feature or area forming the basis for registration of a real right and which has been signed by a person recognised under any law then in force as a land surveyor, or which has been approved or certified by a Surveyor-General and includes a diagram or copy thereof prepared in a Surveyor-General's office and approved or certified as such, or a document which has at any time, prior to the commencement of this Act, been accepted as a diagram in a deeds registry or Surveyor-General's office in the Republic or in any such office situated in any area which became part of the Republic at the commencement of the Constitution, 1993; (v)*" (DLA, 1997). The Survey Act requires that general plans or diagrams showing the location of land signed by land surveyor shall be approved at the SGO and registered in the deeds registry. The practice of cadastral surveying in South Africa is well organised and precise for a land registration system. Coordinates uniquely identified on the geodetic grid are mandatory for the beacons of any boundary surveys. The country has been implementing a coordinated cadastre over fifty years and all modern surveys are based on the South Africa geodetic control network - Cape Datum with reference to the World Geodetic System 1984 (WGS84), which contributes to uniform standards of accuracy. This integrated system consists of approximately 52,000 control points distributed throughout the country (Conrad and Nga-Fong, 2002). Surveyed boundaries together with its diagrams are examined and approved. In RSA, litigation with respect to property boundaries is rare and when disputes do arise, instruments in the Survey Act provide agreement procedures and arbitration rules for professional land surveyors (Conrad and Nga-Fong, 2002).

The registration process is normally completed within 10 working days from lodgement (DLA, 2004a). The Deeds Registries are self-financing, with surplus for the 2003/2004 financial year without any increase in fees charged for the various services. A scanning solution is applied in the registries; it has the potentials to support the RSA's proposed e-Cadastre (a system for the electronic submission and processing of deeds and diagrams), as well as full automation for the present manual processes. The e-Cadastre is an integral part of the RSA's Department of Land Information Systems Plan. It is expected that the system would reduce survey approval and deeds registration turn-around time and also give better access to registration services from remote areas. This is because RSA already have in place an ICT infrastructure to support the proposed system. An important observation is the Users' Requirements Specifications for Deeds Registries that is being carried out by the Department of Land Affairs in collaboration with the State Information Technology Agency in preparation for e-Cadastre project. This indicates the importance of user requirement survey and analysis in the provision of land and property-related information.

The major functions of the Deed Registries are: registration of real rights in land, maintenance of public land register, provision of registration information and archiving of registration records. The Deeds Registries Act No. 37 of 1997 allows any person, upon payment of the prescribed fees to inspect the public registers in Deed Registry and to make copies of the records therein (DLA, 2004a). It was indicated in 2003/2004 annual report of the Department of Land Affairs that: *“the Deeds Registries' Information Systems provide electronic access to registration information from remote locations in South Africa and, in the case of the Deeds Web, from anywhere in the world via the Internet”*.

The Deeds Registries use microfilm as the medium for archiving. Three copies of each film are produced: two silver master copies and one diazo (blue) working copy. One silver master copy is stored within the Deeds Registry and the other outside the Deeds Registry for recovery in case of disaster such as fire within the registry. The proposed scanning solution is not planned as a replacement of the microfilm. The plan is to replace the filming of the records with a scanning process and produce the scanned images in microfilm format.

The management and provision of cadastral information is purely the responsibility of the four provincial Surveyors – General Offices in South Africa. The offices regulate cadastral surveys in their respective provinces, in addition to the following functions:

- examination and approval of diagrams, general plans and sectional title plans prior to their being registered in a Deeds Registry;
- preparation of cadastral maps and plans, both in paper and digital formats;
- storage and updating of all documents and records pertaining to cadastral surveys, and
- delivery of data, information and advisory services in all areas relating to cadastre (DLA, 2004b).

Generally speaking, RSA operates an accurate and reliable deeds system (Conrad and Nga-Fong, 2002). Land registration and cadastral information are well kept in public registers and available to interested individuals or groups for a fee. A better future awaits the LIServices industry in RSA with the present efforts towards appropriate use of ICT and increasing demand for land registration information. The Chief Directorate – Deeds Registration processed about 11.5 million electronic information requests from Aktex and DeedsWebs users during the 2003/2004 financial year representing an increase of about 13.6% over 2002/2003 financial year requests. DeedsWebs is the Department of Lands Affairs website for the supply of deeds registration information, as shown in figure 0.1. To use the DeedsWeb, one need a user name and password, meaning that one has to register first, this may not be necessary because in any case, the users have to pay for requested services. It envisaged that e-Cadastre services will enhance the capability of the Department of Land Affairs in meeting the requests of users as would be provided in the users' requirements specifications. The key feature of the RSA land registration and cadastral system are given in table 2.6 and compared with the situation in Nigeria.

RSA is presently in the final phase of the development of a management system for the Cadastral Spatial Data of the Chief Surveyor General. The system manages and puts on view more than eight million individual properties in South Africa, with the correct location of each property. South Africa is one of the few countries in the world to have all of its cadastral data digitally available. Most other countries in the world are either still in the process of establishing such digital data, or have not yet

started with the process of computer mapping (Berg, 2004). It therefore becomes clear that Nigeria and indeed other African countries have a lot to learn from the experience of South Africa. It is not an over-statement or exaggeration to say that South Africa is an example of 'good' practice for land registration and cadastral services in the African continent.

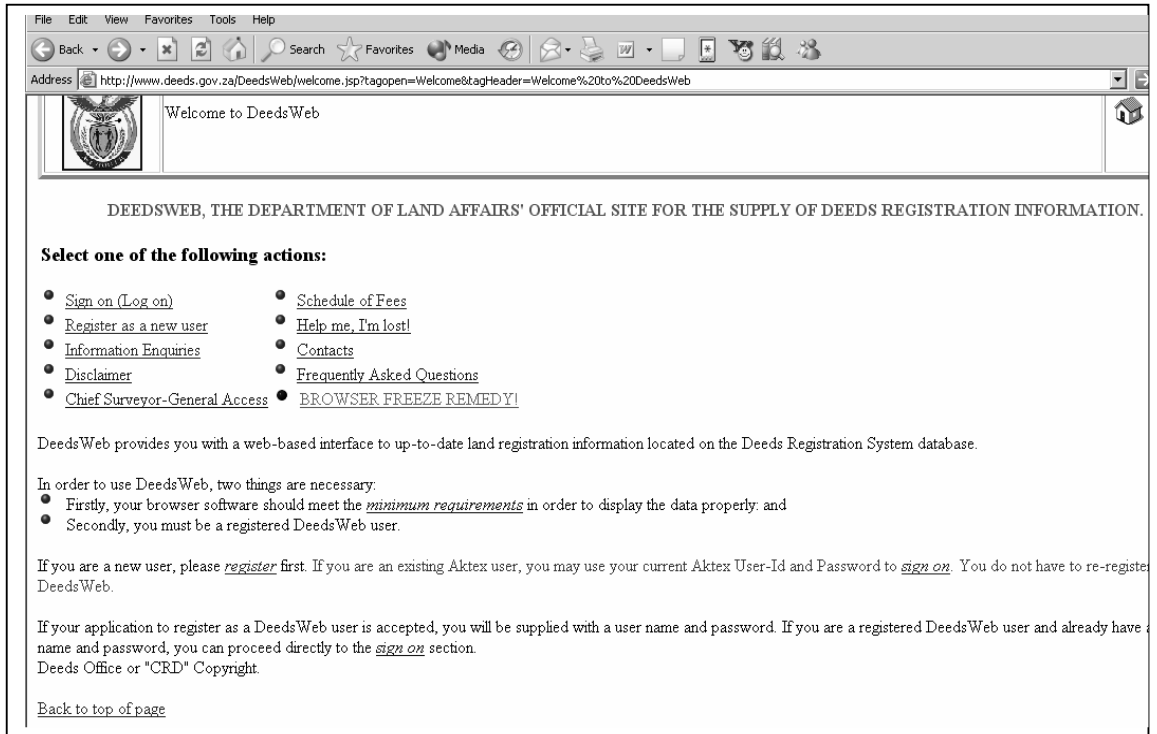


Figure 0-1 South Africa's DeedsWeb

(<http://www.deeds.gov.za/>)

Appendix 2: Structured interview for LIService providers

1. Name of organisation:

.....
.....

2. Name of Respondent:

3. Rank or position of respondent in the organisation:

4. Could you please describe the present procedure of approval of survey plan by the Survey General of Ondo State? *(Answer on the back page)*

5. Could you please describe the present procedure of granting statutory rights of occupancy to land in Ondo State? *(Answer on the back page)*

6. Apart from the Land Use Decree of 1978, are there any regulations, official instructions, procedures and directives for granting statutory rights of occupancy? Yes No

7. If the **answer to question 5 is yes**, kindly give examples of the regulations, official instructions, procedures and directive.
.....
.....
.....

8. How can one get copies of the regulations, official instructions, procedures and directive?
.....
.....

9. What are the existing problems in the delivery of cadastral and land registration services in Ondo State, Nigeria?
.....
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.....
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.....
.....
.....

10. In your own considered opinion, how do you think that we solve these problems?



.....

.....

.....

.....

.....

11. Do you think that the following are part of the solution?

- a Administrative re-organisation (processes & people) d Technology g Improved funding i Others; *please specify:*
- b Training e Provision of better office space / accommodation h Cooperation with other organisations
- c Telecommunication f Power supply (electricity)
-
-
-

12. Please give details of how we can these solutions should look like in specific terms.

(a) Administrative re-organisation (processes & people)
(b) Training
(c) Telecommunication
(d) Technology



(e) Provision of better office space / accommodation
(f) Power supply (electricity)
(g) Improved funding
(h) Cooperation with other organisations
<i>Public Private Partnership (PPP), Public Private Cooperation (PPC), Exchange of Data / Information (EDI), Staff Exchange Programmes (SEP), etc. Note the type or category of organisation.</i>
(i) Others

13. What are your general remarks or comments or suggestions on cadastral and land registration / property-related information in Ondo State Nigeria?

.....

.....

Appendix 3: Questionnaire for geo-information service providers

Introduction

This survey is intended to obtain information about organisations involved in the production and management of geo-information, particularly production of land and property-related information in Ondo State, Nigeria. Though the investigation is purely for research and academic purposes, it will be treated with utmost privacy and answers will only be used as part of the input or contribution into a thesis. It would be highly appreciated if you could please study the questions carefully and provide answers accordingly. If the space provided to answer any question is not sufficient, please write at the back of the page. The interviewer / research student will give more explanation where questions are not clear. Please accept our gratefulness to you for sparing your precious time in answering the questions.

1. Name of organisation:

2. Position or rank of respondent:

3. How would you describe your organisation?

- Fully private (profit-oriented & completely funded by market) Public (partial cost recovery & partial government funding) Others; *please specify*:
- Fully public (non profit-oriented & entirely funded by government) Public (full cost recovery, no government funding)

4. Is your organisation involved in the provision of geographically referenced or spatially related data or information? Yes No

5. If Yes, which type:

- Topographic only Land registration & cadastral Others; *please specify*:
- Cadastral only Topographic & cadastral
- Land registration only All of the above

6. What level of importance would you assign to the provision of geo-data or information selected in question 5.

- Very crucial Crucial Indifferent Trivial

7. Is your organisation mandated by any law, regulation, edict or policy to recover (partly or totally) the cost of providing services, products or information? Yes No

8. If your answer to *question 7 is yes*, what percentage of your production cost are you expected to recover?

- Less than 25 % 25 – 50% 51 – 75 % 76 – 100 %

9. How do you recover your cost of production? (*You may select more than one option, please*)

- Sale of conventional products like maps Provision of information, e.g. confirmation of ownership Others; *please specify*:
- Services e.g. training & consultancy Advertisement, sponsorships, non-governmental sources 110

10. Is the provision of geo-information the core activity or primary responsibility of your organisation? Yes No

11. If your answer to question 10 is No, please specify the primary responsibility of your organisation.

- | | | |
|--|--------------------------------------|--|
| <input type="checkbox"/> Utilities (water, electricity, telecom, etc) | <input type="checkbox"/> Taxation | <input type="checkbox"/> Others; please specify: |
| <input type="checkbox"/> Environment, Resources, Waste management, etc | <input type="checkbox"/> Engineering | |

12. If the provision of geo-information **is not the core activity or primary responsibility** of your organisation, why is your organisation involved in the production of geo-data?

.....

13. Do you have cooperation with other establishments or organisations? Yes No

14. If yes, what is the primary responsibility or nature of the organisations that your organisation cooperates with?

- | | | |
|---|--|--|
| <input type="checkbox"/> Management Consultant | <input type="checkbox"/> Land registration | <input type="checkbox"/> Utilities |
| <input type="checkbox"/> Engineering | <input type="checkbox"/> Cadastral | <input type="checkbox"/> Financial institutions: banks insurance, etc. |
| <input type="checkbox"/> Agriculture & Forestry | <input type="checkbox"/> Topographic | <input type="checkbox"/> Others; please specify: |

15. Is there any law, regulation or policy in Ondo State that stipulates the need for formal relationship or co-ordination between organisations responsible for registering land rights, cadastral survey and mapping, land valuation, land use, etc?

Yes No

16. Is there is any need for formal exchange of information between organisations or departments involved in geo-information production and management?

Yes No

17. Please, give a brief explanation of your answer to question 16.

18. Do you consider it necessary for public organisations responsible for registering land rights, cadastral survey mapping, land and property valuation and land use to work under the same umbrella as one organisation?

Yes No

19. Kindly, give a concise reason for your answer to question 18.

20. Which technology is your organisation using for production?

- Complete digital solution Combination of digital & analogue solutions
 Purely analogue (conventional) solution

21. If your organisation is using a combination of digital and analogue, which part is digital or analogue?

Digital:	
Analogue:	

22. Please give a list of products and services provided by your organisation?

(a) Maps & Plans. Please list the **types and scales of maps** produced by your organisation:

No.	Description of map, plans or diagrams	Scale

(b) Land and property-related information (*You may select more than one option, please*):

- Ownership Use of land History Boundary information Bankruptcy orders
 Rights Leases Allocation Size of parcels Inheritances
 Restrictions Value Sublease Zip code Gender
 Transfers Mortgages Rent charges Court judgements Subdivisions

(c) Please list **other services & products** of your organisation not mentioned in question 22 (b) (previous page).

No.	Description of other products and services



23. In your own considered opinion, is there any need for a separation between cadastral maps and land registers? Yes No

24. Kindly give a rationale for your opinion in question 23.

25. What do you think is responsible for the separation between ‘maps’ and ‘registers’ as in most organisations in Nigeria?

- | | | |
|--|--|--|
| <input type="checkbox"/> The only available option | <input type="checkbox"/> Restriction by available technology | <input type="checkbox"/> Others; <i>please specify</i> : |
| <input type="checkbox"/> Faster way of working | <input type="checkbox"/> Skill / manpower | |
| | | |

26. Does your organisation have a website? Yes No

27. If your answer to **question 26 is yes**, please give the address of the website:

28. If your answer to **question 26 is no**, are you planning to have a website? Yes No

29. If your organisation is planning to have a website, when?

30. If your organisation is not planning to have a website, why?

31. Are you familiar with online (through internet) delivery of cadastral and land registration information? Yes No

32. Is your organisation planning for any kind online delivery of services?

Yes No

33. Kindly summarise (if any) the proposal of your organisation for online delivery:

34. What are the problems associated with the provision of cadastral and land registration (property-related) information in Ondo State? (*You may select more than one option, please*)

- | | | |
|---|--|---|
| <input type="checkbox"/> Personnel (skill / manpower) | <input type="checkbox"/> Equipment / Technology | <input type="checkbox"/> Administrative processes, e.g. excessive bureaucratic bottlenecks, etc |
| <input type="checkbox"/> Processes are not well-defined and No Quality Control Measures | <input type="checkbox"/> Little or no attention from the government | <input type="checkbox"/> Customers are not willing to pay for products & services |
| <input type="checkbox"/> No market or No customer | <input type="checkbox"/> Unofficial land market | <input type="checkbox"/> Land has no value |
| <input type="checkbox"/> Bribery & corruption | <input type="checkbox"/> Ineffective regulations & law, e.g. The Land use Decree of 1978 | |

35. Please list other problems associated with the provision of cadastral and land registration (property-related) information in Ondo State, that are not listed in question 25.

.....
.....
.....

36. What are the realistic solutions to the problems listed in questions 25 and 26?

.....
.....
.....

37. Please give **general comments and remarks** about cadastral and land registration (property-related) information in Ondo State.

.....
.....
.....

Appendix 4: Questionnaire for regular users

Introduction

The primary aim of this survey is to obtain information on the needs of users of land registration and cadastral information in Ondo State, Nigeria to serve as input in designing and developing solutions for improving the availability of land registration and cadastral information in Ondo State Nigeria. The users' requirement survey is purely for research and academic purposes. Nevertheless, responses will be treated with utmost privacy and answers will only be used as part of the input or contribution into a thesis. It would be highly appreciated if you could please study the questions carefully and provide answers accordingly. If the space provided to answer any question is not sufficient, please write at the back of the page. The interviewer / research student will give more explanation where questions are not clear. Please accept our gratefulness to you for sparing your precious time in answering the questions.

1. Name of establishment or company:

2. Position or rank of respondent:

3. How would you describe your establishment or company?

- | | | |
|---|--|--|
| <input type="checkbox"/> Fully private (profit-oriented & completely funded by market) | <input type="checkbox"/> Public (partial cost recovery & partial government funding) | <input type="checkbox"/> Others; <i>please specify</i> : |
| <input type="checkbox"/> Fully public (non profit-oriented & entirely funded by government) | <input type="checkbox"/> Public (full cost recovery, no government funding) | |

4. Does your establishment or company use geographically referenced or spatially related data or information? Yes No

5. If yes, which type / category? (*You may select more than one option, please*)

- | | | |
|---|--|--|
| <input type="checkbox"/> Topographic only | <input type="checkbox"/> Land registration & cadastral | <input type="checkbox"/> Others; <i>please specify</i> : |
| <input type="checkbox"/> Cadastral only | <input type="checkbox"/> Topographic & cadastral | |
| <input type="checkbox"/> Land registration only | <input type="checkbox"/> All of the above | |

6. What is the level of importance of geo-data or information selected in question 5 to your organisation?

- | | | | |
|---------------------------------------|----------------------------------|--------------------------------------|----------------------------------|
| <input type="checkbox"/> Very crucial | <input type="checkbox"/> Crucial | <input type="checkbox"/> Indifferent | <input type="checkbox"/> Trivial |
|---------------------------------------|----------------------------------|--------------------------------------|----------------------------------|

7. Is your establishment or company using cadastral and property-related information or land registration on a daily or regular basis? Yes No

8. How do you get your cadastral and property-related information? Please give the name(s) of the organisation(s) from which you get your data or information.
.....

9. Which of the organisations listed in questions 8 is the most important to you?

.....

10. Why is the organisation selected in question 9 the most important to you? (You may select more than one option, please)

- Prompt & efficient services
 Cost effective
 Others; please specify:

 The only source needed information (No alternative)

11. Which cadastral products and services do you need and consider important for the activities of your establishment or company? Kindly fill in the table below. Select all the products that you need and write others not in the list in the space provided.

No.	Cadastral products	Select (✓) products required
1	Large scale cadastral maps (scale greater than 1: 5,000)	
2	Medium scale cadastral maps (1: 5,000 – 1: 10,000)	
3	Cadastral maps (scale less than 1: 10,000)	
4	Survey plan of individual parcels only	
5	Survey plan of individual and adjoining parcels	
6	Layout and master plans	
7		
8		
No.	Cadastral services	Select (✓) products required
1	Adjudication	
2	Parcel subdivision	
3	Surveyor’s General Approval	
4	Beacon numbers and coordinates	
5		
6		

12. Please give the **present cost** of these products and services?

No.	Cadastral products	Cost in Naira (₦)
1	Large scale cadastral maps (scale greater than 1: 5,000)	
2	Medium scale cadastral maps (1: 5,000 – 1: 10,000)	
3	Cadastral maps (scale less than 1: 10,000)	
4	Survey plan of individual parcels only	
5	Survey plan of individual and adjoining parcels	
6	Layout and master plans	
7		

8		
No.	Cadastral services	Cost in Naira (₦)
1	Adjudication	
2	Parcel subdivision	
3	Surveyor's General Approval	
4	Beacon numbers and coordinates	
5		
6		

13. Is your organisation or company willing to pay more or less for the products and services listed above?

Will like to pay more
 Will like to pay less
 Does not want prices changes

14. Kindly indicate the prices that you would like to pay (**suggested or proposed prices**) for the various products and services.

No.	Cadastral products	Proposed prices in Naira (₦)
1	Large scale cadastral maps (scale greater than 1: 5,000)	
2	Medium scale cadastral maps (1: 5,000 – 1: 10,000)	
3	Cadastral maps (scale less than 1: 10,000)	
4	Survey plan of individual parcels only	
5	Survey plan of individual and adjoining parcels only	
6	Layout and master plans	
7		
8		
No.	Cadastral services	Select (✓) products required
1	Adjudication	
2	Parcel subdivision	
3	Surveyor's General Approval	
4	Beacon numbers and coordinates	
5		
6		

15. Which of the following property-related or land registration products and services do you need and consider essential for the activities of your establishment or company? Select from the table below the products and/or services that you need and write others not in the list in the space provided.

No	Parcel related information or land registration products and services	Select (✓) products required
1	Ownership	
	(a) Name of owner	

	(b) Gender	
	(c) Date of Birth (DOB)	
	(d) Marital status	
	(e) Next of kin	
	(f) Occupation	
2	Size of parcels	
3	Value	
4	Mortgages	
5	Rights	
6	Restrictions	
7	Transfers	
8	Leases / Sublease	
9	Use of land	
10	Land allocation	
11	Fees, such as ground rent	
12	Boundary information	
13	History / background	
14	Court judgements	
15	Bankruptcy orders	
16	Inheritances	
17	Zip Code	
18	Closeness to amenities, e.g. school, hospital, crèche, etc	
<i>Please list below other Parcel related information or land registration products and services that you need but are not listed above</i>		

16. Please indicate the amount you are currently paying for the products / services selected in question 15 and how much you would like to pay for the products / services.

No	Parcel related information or land registration products and services	Present cost in Naira (₦)	Price willing & able to pay in Naira (₦)
1	Ownership		
	(a) Name of owner		
	(b) Gender		
	(c) Date of Birth (DOB)		
	(d) Marital status		
	(e) Next of kin		
	(f) Occupation		
2	Size of parcels		
3	Value		



4	Mortgages		
5	Rights		
6	Restrictions		
7	Transfers		
8	Leases / Sublease		
9	Use of land		
10	Land allocation		
11	Fees, such as ground rent		
12	Boundary information		
13	History / background		
14	Court judgements		
15	Bankruptcy orders		
16	Inheritances		
17	Zip Code		
18	Closeness to amenities, e.g. school, hospital, crèche, etc		
Other parcel related information or land registration products and services required but are not listed above			

17. In a general sense, how would you like to receive the products and services listed above?

In digital form only
 Analogue & Digital
 Others; *please specify:*

 In analogue form only

18. Please indicate how you want **each** of the products and services you need. (*You may select more than one option, i.e. select (✓) both ANALOGUE and DIGITAL, if you will like to have both*).

No	Parcel related information or land registration products and services	Select (✓) for DIGITAL	Select (✓) for ANALOGUE
1	Ownership		
	(a) Name of owner		
	(b) Gender		
	(c) Date of Birth (DOB)		
	(d) Marital status		
	(e) Next of kin		
	(f) Occupation		
2	Size of parcels		
3	Value		



4	Mortgages		
5	Rights		
6	Restrictions		
7	Transfers		
8	Leases / Sublease		
9	Use of land		
10	Land allocation		
11	Fees, such as ground rent		
12	Boundary information		
13	History / background		
14	Court judgements		
15	Bankruptcy orders		
16	Inheritances		
17	Zip Code		
18	Closeness to amenities, e.g. school, hospital, crèche, etc		
Other parcel related information or land registration products and services required but are not listed above			

19. Are necessary hardware and software for accessing, viewing processing and storage of digital geo-data available in your establishment or company? Yes No
20. If yes, kindly give a list of the available hardware and software:

21. What do you need that you are not getting?

22. Would there be any improvement in the performance and/or profitability of your establishment if you are able to get all the land registration and cadastral information that you need in the format appropriate for your activities / operations? Yes No
23. Will your establishment be able to pay higher prices for improved services and enhanced land registration and cadastral information? Yes No
24. Please give a brief justification or explanation of your answer to question 22.



25. Are you familiar with online (*through internet*) delivery of cadastral and land registration information? Yes No

26. Do you have access to the Internet within your establishment or company? Yes No

27. If yes, kindly give the number of hours in a day that the Internet in your establishment or company is available for use: *Hours per Day*.

28. Would you like to receive Land Information Services (LIServices) online?
 Yes No

29. If you would like to receive LIServices online, please specify level and type of services that you would like to receive online. *If you do not select complete online services (No. 1), you can select more than one option.*

No.	Level of online LIService	Select (✓) online service
1	Complete online services (<i>all aspects: ordering, information, delivery of digital products, electronic payment, processing, etc.</i>)	
2	Submission of requests	
3	Confirmation of C. of O.	
4	Consents to alienate	
5	Request for information	
6	Downloading of application forms	
7	Others: (a)	
	(b)	
	(c)	

30. If your establishment or company does not have internet facility, are you planning or proposing to have internet facility? Yes No

31. If your establishment or company is planning to have internet facility, how soon?
 Less than 1 year 1 – 2 years 3 years or more Not clear yet

32. What are the problems associated with the availability and use of cadastral and land registration (property-related) information in Ondo State? (*You may select more than one option, please*)

- Personnel (skill / manpower) Equipment / Technology Administrative processes, e.g. excessive bureaucratic bottlenecks, etc
- Processes are not well-defined and No Quality Control Measures Little or no attention from the government Customers are not willing to pay for products & services
- No market or No customer Unofficial land market Land has no value
- Bribery & corruption Ineffective regulations & law, e.g. The Land use Decree of 1978



33. Please list other problems associated with the provision of cadastral and land registration (property-related) information in Ondo State, that are not listed in question 32 above.

.....
.....

36. What are the realistic solutions to the problems listed in questions 32 and 33?

.....
.....

37. What other comments or suggestions do you have regarding the availability and use of cadastral and land registration information in Ondo State, Nigeria?

.....
.....

Appendix 5: Questionnaire for ad hoc users

Introduction

This survey is intended for infrequent or occasional users of cadastral and land information services. Such users may be private citizen or corporate organisations that requests for cadastral and land information services once in a while. The primary aim of this survey is to obtain information on the needs of users of land registration and cadastral information in Ondo State, Nigeria to serve as input in designing and developing solutions for improving the availability of land registration and cadastral information in Ondo State Nigeria. The users' requirement survey is purely for research and academic purposes. Nevertheless, responses will be treated with utmost privacy and answers will only be used as part of the input or contribution into a thesis. It would be highly appreciated if you could please study the questions carefully and provide answers accordingly. If the space provided to answer any question is not sufficient, please write at the back of the page. The interviewer / research student will give more explanation where questions are not clear. Please accept our gratefulness to you for sparing your precious time in answering the questions.

1. Do you use any type / category of geographically related information listed below? (You may select more than one option, please)

<input type="checkbox"/> Topographic only	<input type="checkbox"/> Land registration & cadastral	<input type="checkbox"/> Others; please specify:
<input type="checkbox"/> Cadastral only	<input type="checkbox"/> Topographic & cadastral
<input type="checkbox"/> Land registration / property-related only	<input type="checkbox"/> All of the above

2. Have you requested for or used any of the services listed below in the past? Select (tick) from the table below the services or products that you have requested for in the past.

No.	Cadastral products	Select (✓) products required
1	Large scale cadastral maps (scale greater than 1: 5,000)	
2	Medium scale cadastral maps (1: 5,000 – 1: 10,000)	
3	Cadastral maps (scale less than 1: 10,000)	
4	Survey plan of individual parcels only	
5	Survey plan of individual and adjoining parcels	
6	Layout and master plans	
7	Adjudication	
8	Parcel subdivision	
9	Surveyor's General Approval	
10	Beacon numbers and coordinates	
11	Others not included above: (a)	

	(b)	
	(c)	

3. Select any of the following land information services that you have used or requested for in the past.

No	Parcel related information or land registration products and services	Select (✓) products required
1	Ownership	
	(a) Name of owner	
	(b) Gender	
	(c) Date of Birth (DOB)	
	(d) Marital status	
	(e) Next of kin	
	(f) Occupation	
2	Size of parcels	
3	Value	
4	Mortgages	
5	Rights	
6	Restrictions	
7	Transfers	
8	Leases / Sublease	
9	Use of land	
10	Land allocation	
11	Fees, such as ground rent	
12	Boundary information	
13	History / background	
14	Court judgements	
15	Bankruptcy orders	
16	Inheritances	
17	Zip Code	
18	Closeness to amenities, e.g. school, hospital, crèche, etc	
<i>Please list below other parcel related information or land registration products and services that you have requested for or used in the past, but are not listed above</i>		

4. From which organisation(s) did request for or received the products and services selected in questions 3 and 4?



5. If you have an alternative would you like to request for these services from the organisation(s) again or repeat your visit? Yes No

6. If your answer to question 5 is No, why? (You may select more than one option, please)

- Delays in delivery services: too long time
- High cost
- Office cannot be easily reached
- Information / products are not useful
- Too much 'egunje'
- Poor quality
- Staff lacks courtesy
- Others, please specify.....

7. How would you like to receive land and property-related information and services?

- In digital form only
- Analogue & Digital
- Others; please specify:
- In analogue form only

8. Which land and property-related information and services do you need that you are not getting?

9. Can you use a computer? Yes No

10. Do you have access to a computer? Yes No

11. If you have access to a computer, where?

- At work
- At home
- Work and home
- Business centre / Internet café

12. Are you familiar with online (through internet) delivery of cadastral and land registration information? Yes No

13. Do you have access to the Internet? Yes No

14. If yes, kindly give the number of hours in a day that you use the Internet:

..... hours per day.

15. Would you like to receive Land Information Services (LIServices) online?

- Yes
- No

16. Are you satisfied and happy with the present level of delivery of LIServices in Ondo State?

- Yes
- No

17. If you are not satisfied with the present level of delivery of LIServices in Ondo State, suggest what has to be improved:

.....
.....

18. On the whole, would you like to pay more if the present level of delivery of LIServices in Ondo State in Ondo State is improved? Yes No

19. Please explain your answer to question 18.....

.....
.....

20. What other comments or suggestions do you have regarding the availability and use of cadastral and land registration information in Ondo State, Nigeria?

.....
.....
.....
.....

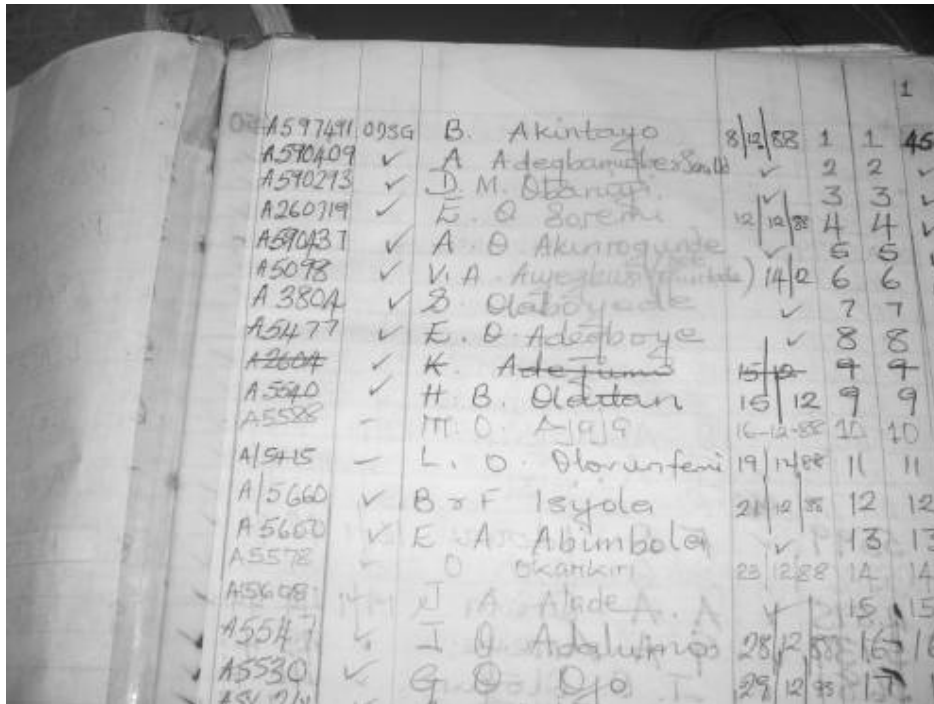
Appendix 6: Storage of documents in the deeds registry



Appendix 7: More organised part of the deeds registry

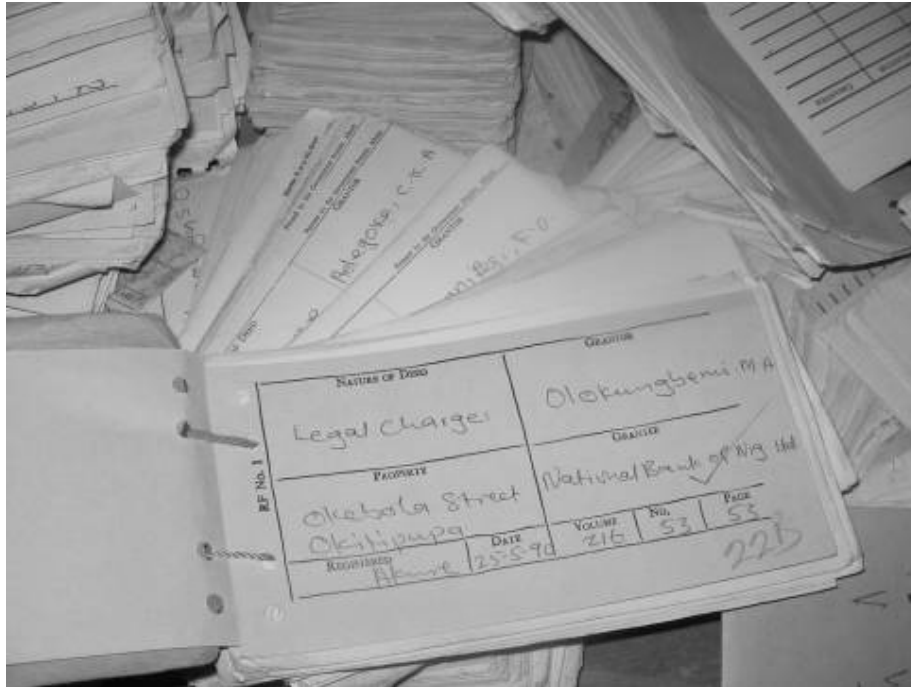


Appendix 8: A page of a deed register in the registry



Deed No.	Initials	Name	Date	Col 1	Col 2	Col 3
A597491	093G	B. Akintayo	8/12/88	1	1	450
A570409	✓	A. Adegbanjo	✓	2	2	✓
A570273	✓	D. M. Olaniran	✓	3	3	✓
A260719	✓	E. O. Soremi	12/12/88	4	4	✓
A590437	✓	A. O. Akintoye	✓	5	5	✓
A5098	✓	V. A. Awelusi	14/2	6	6	✓
A3804	✓	B. Olatoye	✓	7	7	✓
A5477	✓	E. O. Adebayo	✓	8	8	✓
A2604	✓	K. Adejumo	15/12	9	9	✓
A5240	✓	H. B. Olatun	16/12	9	9	✓
A5528	-	M. O. Ayo	16-12-88	10	10	✓
A1945	-	L. O. Olorunfemi	19/12/88	11	11	✓
A15660	✓	B. F. Isyola	21/12/88	12	12	✓
A5600	✓	E. A. Abimbola	✓	13	13	✓
A5578	✓	O. Okunribi	23/12/88	14	14	✓
A5608	✓	J. A. Alade	✓	15	15	✓
A5547	✓	I. O. Adaluyi	28/12/88	16	16	✓
A5530	✓	G. O. Ojo	29/12/88	17	17	✓

Appendix 9: Information on a property card



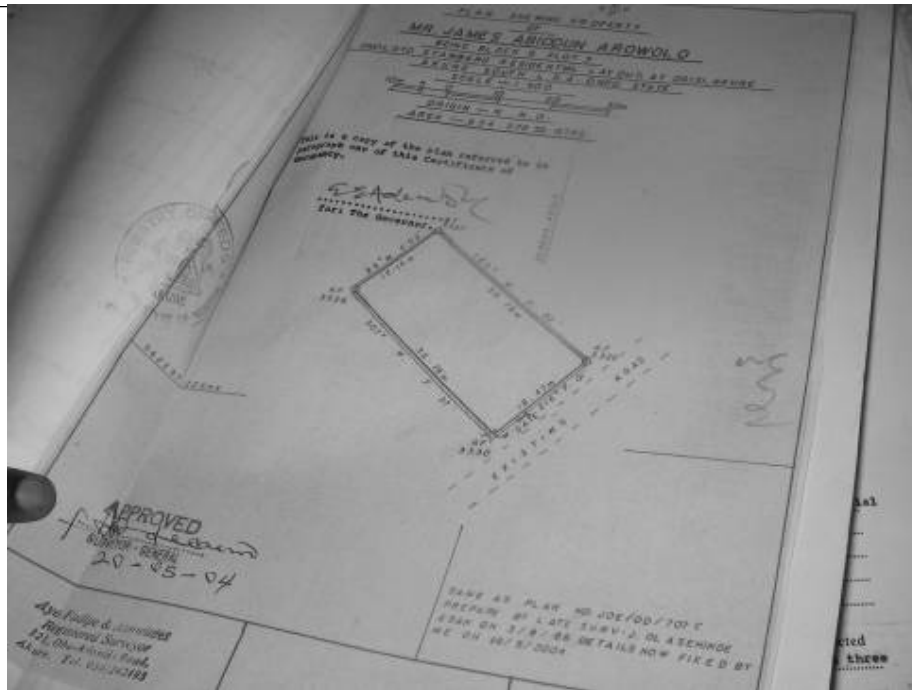
Appendix 10: A search on the public record keeping card



Appendix 11: Damaged master plan: inappropriate for charting



Appendix 12: An approved survey plan affixed to a C. of O.



Appendix 13: Preparation of beacons for cadastral surveys



Appendix 15: Letter of invitation to the workshop



Appendix 16: Workshop programme

1. Aim and objectives of the workshop

The primary aim of workshop is to bring users and stakeholders of cadastral and land registration information in Ondo State, Nigeria together to discuss ways of improving the availability of cadastral and land registration information in Ondo State, Nigeria.

The objectives are to:

- determine the present status or situation of Land Information Services (LIServices) and identify critical issues in LIServices delivery in Ondo State;
- propose a new and improved situation and test a model for realising the expected situation;
- find out the implementation conditions for the proposed improved situation and
- discuss relevant issues for the future (e-LIServices, electronic signature, inter-organisational workflows and digital exchange of data and information, etc).

2. Duration of workshop

One (1) day.

3. Target group / proposed participants

- 1) Surveyor General, Ministry of Works, Lands & Housing (MWLH), Akure, Ondo State.
- 2) Surveyor General, Ministry of Works, Lands & Housing, Osogbo, Osun State and/or Surveyor General, Ministry of Works, Lands & Housing, Ado-Ekiti, Ekiti, State.
- 3) Director of Lands, MWLH, Akure, Ondo State.
- 4) Director of Town Planning, MWLH, Akure, Ondo State.
- 5) Director of Finance and Administration, MWLH, Akure, Ondo State.
- 6) A legal practitioner involved in land matters / Lecturer in law.
- 7) Private registered surveyors from Ondo State.
- 8) Private estate surveyors from Ondo State.
- 9) Lecturer in Surveying and mapping.
- 10) Lecturer in estate management.
- 11) An official of the Estate Department of a Bank.
- 12) Officials of a utility company e.g. water corporation, NEPA, post office, etc
- 13) An official of Akure Local Government Council.
- 14) Lecturer in IT (internet & web technology)
- 15) Head of IT Unit of RECTAS
- 16) Head of Academic and Research Division of RECTAS.
- 17) Registered Surveyors in RECTAS.
- 18) Two citizens or users that are not professionals involved in land matters.
- 19) An official of a non-governmental organisation.
- 20) A private GIS consultant or specialist.
- 21) Lecturer in Geoinformation

4. Venue

Regional Centre for Training in Aerospace Surveys (RECTAS)
Off Road 1, Obafemi Awolowo University (OAU) Campus
Ile-Ife, Osun State
Nigeria

5. Date and Time

Tuesday, November 16, 2004
10.00am to 4.00pm

6. Registration

The attached registration form should be filled and submitted at the venue of the workshop or returned to the Executive Director, RECTAS on or before Monday, November 15, 2004.

7. Chairman

Executive Director of RECTAS

8. Agenda

Time	Programme
	Submission of registration form
10.00	Opening / Welcome speech by the Chairman
10.15	Introduction of the workshop (<i>AO Akingbade</i>)
10.30	Discussion of present situation of LIServices in Ondo State (<i>Surveyor General & Director of Lands, Ondo State</i>)
11.00	Questions
11.30	Proposed situation (<i>Presentation by AO Akingbade</i>)
12.00	Discussion on the proposal (questions and answers)
12.30	Lunch Break and Informal Meeting
14.00	Electronic delivery of LIServices & Internet GIS (<i>AO Akingbade</i>)
14.15	Questions and discussions
14.30	Discussion – Relevant issues for the future: e-LIServices, electronic signature, inter-organisational workflows and digital exchange of data and information, Global Positioning Systems, Remote Sensing and Cadastral Surveys: Does the present survey regulations support or allow satellite technology for cadastral surveys? Referencing – the Geoid, etc. <i>Moderator: Surv. Omotoso Oluborode</i>
15.15	Enabling laws and regulations for change (electronic signature, encryption, etc.).
15.30	Tea / Coffee Break and Informal Meeting
15.45	Summary of discussions & vote of thanks by Head, A & R Division, RECTAS.
16.00	Final remarks & closing by the Chairman


9. Workshop fee

Free for all invited participants

10. Additional information

Apart from the provision of writing materials, lunch and refreshments, no additional costs would be borne by the workshop organisers.

Appendix 17: Registration at the workshop

 IMPROVEMENT OF AVAILABILITY OF LAND REGISTRATION AND CADASTRAL INFORMATION IN ONDO STATE, NIGERIA

Workshop on Improvement of Availability of Land Registration & Cadastral Information in Ondo State, Nigeria

REGISTRATION FORM

1. Name of participant: Professor E. A. Ogunjumo

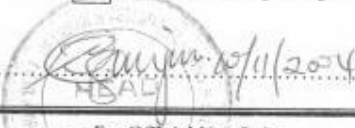
2. Sex: Male Date of Birth: June 7, 1942

3. Name & Address of organisation: Department of Urban and Regional Planning
Obafemi Awolowo University, Ile-Ife
Osun State

4. Position or responsibility in the organisation: Head of Department

5. Length of experience in cadastral and land registration / property related activities: No relevant experience 1 day - 10 years 11 - 20 years
 21 - 30 years More than 30 years

6. Highest level of education: Secondary school level University level - 1st degree Others: *please specify*:
 Technical level - Diploma University level - higher degree

7. Signature & Date:  10/11/2024

For Official Use Only

Reg. No.
PAT-G:
RM:

INTERNATIONAL INSTITUTE FOR GEO-INFORMATION SCIENCE AND EARTH OBSERVATION 3

**Appendix 18: Workshop opening by the Chairman,
& Executive Director of RECTAS, *Dr. Olajide KUFONIYI***



Appendix 19: A cross-section of participants at the workshop



Appendix 20 Part of state residential layout (Ore Plan 8)

