LAND REGISTRATION PROCESS MODELLING FOR COMPLEX LAND TENURE SYSTEM IN GHANA

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March, 2018

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Enschede, The Netherlands, March 2018

Thesis submitted to the Faculty of Geo-Information Science and Earth Observation of the University of Twente in partial fulfilment of the requirements for the degree of Master of Science in Geo-Information Science and Earth Observation. Specialization: Land Administration

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ABSTRACT

Land registration forms the backbone of Land Administration in every country. Some countries use indigenous ways to record land right, which is easy and fast. In the conventional system, land rights are recorded following rigid procedures which hinders the aim of Land Administration. Land registration system in Accra has had a facelift through the implementation of the Ghana Land Administration Project between 2000-2006. The program helped to merge independent land registration institutions with the aim of reducing poverty through the provision of fast and efficient land registration services.

Yet, this program yielded few results. Some researchers attribute it to undefined institutional mandates which led to duplication of functions, by the Lands Commission and its stakeholders. The causes of the delay in the land registration process are not yet found, whether it is the complexity of tenure systems, a multiplicity of institutions, and long registration procedures. This research aims to examine the processes of land registration in complex land tenure system in Accra-Ghana and re-model the land registration process to ensure efficient delivery of services.

The research used a case study of Accra. Accra was selected because it is the capital city of Ghana with more complex land tenure ownership and registration procedures which slows investment and development. Primary and secondary data on the Land registration process, its problems, and suggestions for improvements were collected from the Lands Commission, Customary Lands Secretariat and the Town and Country Planning Department using semi-structured interviews. To ensure full representation of respondent, Questionnaires were distributed to clients to find out their concerns about the registration process and their suggestions for further improvement.

Findings show that family, stool, and state land registration processes exist in Accra. The land rights recognized in the registration process includes; leasehold, freehold, sublease and assignment. However, it was realised that most land rights registered are the leasehold right. This is because the number of leaseholders keeps increasing having evolved from the stool, family, and state lands. The family and stool land registration were recognized to have longest registration process. This is caused by poor coordination of functions and lack of monitoring and evaluation within the Lands Commission and its stakeholders. This has resulted in bottlenecks such as double site inspection, redundant verification of registration documents, delays in preparation of parcel scheme report and plotting of sitemap. To ensure efficiency, there is the need for the long land registration process to be reduced. Among several options, a digitalisation of the process can facilitate this.

Based on the findings and requirements, a new land registration workflow model was developed and implemented using UML activity diagrams and Process maker. The function of the model is characterised by displayed parcel base map in a process maker using JavaScript (Computer language) which enables to create polygons on parcels and interoperate data within the Lands Commission and its stakeholders. All initiated request was supported by a designed database which would enable staff to save land information. However, due to the limited time of the study, the model was not tested on its applicability for the valuation of stamp duty and ground rent.

To ensure full implementation of the study, the research recommends that the Lands Commission fully utilize the geo-information expertise of its current staff in running the model. It should also ensure effective monitoring and evaluation, clarify the functions of each division in the Lands Commission, provide logistics, and motivate staff. Recommended also is the examination of how valuation and ground rent could be executed in the model. The model in its current desktop format needs to be converted to an online system to ensure fast, and efficient land registration in Accra.

Keywords: *Land registration, Land Administration, Workflow Management System, Land tenure system*

ACKNOWLEDGEMENTS

The Lord is good all the time. Am humbled to acknowledge God for guiding me through this study. May His name be praised!
I wish to thank the Ghana Government through the Ghana Education Trust Fund for having the trust in me to offer me the scholarship to study MSc. Land Administration. I owe the ITC, University of Twente gratitude for offering me admission and a conducive teaching environment to complete my course.

I am glad to express my sincere gratitude to my supervisors; Dr. Javier Morales Guarin and Professor Jaap Zevenbergen for embracing my research idea during the research development stage. Their overwhelming guidance, rich research experience, hard work and professionalism have guided me through the up and downs of this research. Bedankt!
My heartfelt thanks go to Dr. Dimo Todorovski, the course director of Land Administration and the lecturers for their guidance towards the completion of this course.

May I take this opportunity to thank, Mr. Mawule the Director of Lands Valuations Division, Mr. Boafo, Head of Ghana Enterprise Land Information System, Mr. Mawuli, officer in charge of PVLMD, Mr. Timothy, Director of Customer Service and Access Unit, and all young staff of Lands Commission, Accra, for assisting me with data for my research.

I appreciate the contribution of my Land Administration colleagues (course mates), especially Salifu, Royal, A.J.M.Y Hijris and A.A.J. M.H Showaiter for their support during my term of office as the class representative and the president of the Students Association Board of this School. My friends from Geo-informatics, Water Resource and Environment, Natural Resource Management, Urban Planning, and Applied Earth Science can never be forgotten for their support during the struggles in the taught course, most especially the core modules. Our good memories would never be ancient history.

I am much thankful to Mr. Nara, a Ph.D. candidate who reviewed my thesis and provided valuable comments on my filed results. I Wish him all the best of luck in his academic journey.

Last, not least, my appreciation goes to Dr. Edward Kofi Appau Jnr, for the magnificent work done in editing my thesis, my dad Mr. Charles Koomson, Mummy Vivian Tetteh, Madred Owusu Agyeman and my siblings for their prayers and love while I was away.

GOD BLESS YOU ALL!

Appau Williams Miller,
March 2018
Enschede, Netherlands.

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LIST OF ABBREVIATIONS

AMA	Accra Metropolitan Assembly
CLS	Customary Land Secretariat
CSAU	Customer Service and Access Unit
FIG	International Federation of Surveyors
GELIS	Ghana Enterprise Land Information System
GLTN	Global Land Tool Network
GPS	Global Position System
GSS	Ghana Statistical Service
HTML	Hyper Text Mark-up Language
IFAD	International Food and Agricultural Development
ICT	Information and Communication Technology
LAP	Land Administration Project
MMDA's	Metropolitan Municipal District Assembly
LVD	Lands Valuation Division
NGO	Non-Governmental Organization
OASL	Office of the Administrator of Stool Lands
PHP	Hypertext Pre-processor
PVLMD	Public and Vested Land Management Division
RRI	Right Resource Initiative
SMD	Survey and Mapping Division
SPSS	Statistical Package for Social Sciences
TCPD	Town and Country Planning Department
UMB	Universal Merchant Bank
UML	Unified Modelling Language
WFMS	Workflow Management System

GLOSSARY

Customary lands are lands owned by communities under control of chiefs or land priest (skin or stool land) or owned by families, lineages, or clans under control of the respective family, lineage, or clan head (family land). (Ghebru & Lambrecht, 2017a)

Ground rent refers to the consideration paid (rent) on alienable stool land for a lease term *(Afrane, Ariffian, Bujang, Shuaibu, & Kasim, 2016)*

Land Administration is the processes of determining, recording, and disseminating information about the tenure, value and use of land when implementing land management policies *(United Nation, 1996)*

Lands Commission is an institution responsible for managing, formulate, record, and advice the government on the use of public, and stool lands in Ghana

Land registration refers to the official documentation of a legally recognized interest in land and properties *(Bogaerts & Zevenbergen, 2001)*

Land registration modelling describes the processes of simplifying the representation of the land recordation process to inform government, people and stakeholders decision making by indicating probable future opportunities.

Modelling is an iterative process of analyzing complex system with the aim of communicating, forecasting, and understanding the behavior of the system *(Belete, 2017)*

Stamp duty is a fee paid on the assessed value of land by the valuations division of Land Commission of Accra

System Architecture refers to a well-structured collection of independent objects that interact and form a comprehensible entity that performs unachievable functions of an independent artifact *(Guarin, 2004)*.

UML Activity Diagram is a unified modelling language that executes a statement in steps or procedures in a workflow *(Anjorin, Eds, & Hutchison, 2017)*

User requirements are user needs translated into specific plans to produce a product that meet the superior value of their needs *(Grazia & Enrico, 2017)*

Workflow Management Systems are middleware's that allows the performance of automated business processes which leads to the design of flexible and easily sustainable software *(Ferme, Harrer, Geiger, & Pautasso, 2017)*

1. INTRODUCTION

1.1. Background and justification

Over the years, land registration has been one of the core components of building Land Administration in most countries in the world (Enemark, Williamson, & Wallace, 2005). This is because, land registration describes the ownership and right to use a legally acceptable interest in land, recorded that provides a prima facie evidence to the title and protect the owner from unlawful eviction. Zevenbergen (2002), considers land registration as the official recording of legally recognized interest in land.
Over the globe, land registration is supported by either the deed system or title systems of registration. Under the deed system, land documents are submitted at its face value and not subject to detail procedural scrutiny (Akingbade, 2005). Zevenbergen (2002) adds that deed is not evidence of itself. Title registration gives landowners the full legal recognition of land right (Zevenbergen, 2002). This helps to improve the Land Administration infrastructure by creating a large parcel and tenure database that can be used by other institutions (Griffith-charles, 2007).

By viewing land registration from the service delivery perspective, many Land Administration objectives can be achieved. Land registration supports the land market through ease of transfer, taxation, valuation, and mortgage. Capital is easily raised when access to property rights can be easily identified, scrutinized and accessed by owners (Akingbade, 2005). At the economic front, it opens new avenues to establish strong linkages between economic development of the land and conventional land management processes which create informed decision making (Nichols, 1993).
However, land registration causes the substantial cost to people which reduces their willingness to register their lands (Gerstter, Kaphengst & Knoblauch, 2011). Other researchers argue that land registration reduces the benefits of social inclusion to people especially when titles influence property values in prime locations (Durand-Lasserve, 2006).
Elsewhere, land registration processes enhance Land Administration in simplistic land tenure environment where land ownership rests in the hands of one tenure group (Cotula, 2007). Meanwhile, land registration processes implementation in some parts of Africa and Asia have failed where land tenure system seems complex (UN-Habitat, 2014). Meaning, land tenure environment that exists with nested landholding systems such as customary and state tenure systems with interwoven classes of ownership and related issues, negatively affects registration process (Srinivas, 2015). This is especially so in Sub-Sahara Africa and some parts of Latin America as emphasized by Srinivas (2015). This, therefore, results in more people's land rights falling outside the formal register which has created complex interaction between actors of land registration and landowners (UN-Habitat, 2014). Furthermore, bureaucracy and duplication of functions have been identified to cause delays in land registration in some parts of Africa that deserves further investigation. (Larbi, 2006 ; Obeng-odoom, 2016).

In Ghana, land registration requires detailed proof of land ownership especially lands owned by families and stools during registration at the Lands Commission. Since 2000, Ghana introduced a Land Administration Project I and II in the year 2000, with the intent of resolving the problems of Land Administration such as land conflict through double sale of land, boundary disputes, delays in land registration, etc. in the land tenure processes but these projects yielded few results because of one of the problems, one of which is the complexity of tenurial arrangements and registration (Duncan, Lufkin, & Gaafar, 2013).
Moreover, the Land Administration Project II brought the land sector into four umbrella units which reduced the registration period from 36 months to 3 months. These efforts yielded few results due to lack of political commitments (Barry & Danso, 2014). These land units (Survey and Mapping Division, Lands Valuation Division, Land Title Registry and the Public and Vested Land Management Division) were supposed to coordinate their activities such as

- Registration of title to land and other interests (Land Title Registry),
- Facilitate the acquisition of land for Government (Public and Vested Lands Management Division),

- Supervise, regulate, and control the survey and demarcation of land for land use and land registration (Survey and Mapping Division)
- Assessment of stamp duty and values of land (Lands Valuation Division)

The purpose of merging the institutions was to avoid duplication of efforts, as well as to share its core competence with other relevant institutions. However, Service delivery by the Lands Commission has been characterized by lack of coordination between the divisions mostly with unclear mandates have resulted in overlapping and duplication of functions among the Commission and its stakeholders (Duncan et al., 2013). Transparency International (2016) indicates that delays like; double preparation of site plans, delays in the issuance of tax clearance certificate, official request for search report from Land Title Registry and the Public and Vested Land Management Division as well as deficiency of information on the status of applications by clients, affect the business processes of land registration. Therefore, there is the need for a shift in thinking to model complex land tenure registration processes. (Tuladhar 2002 ; Augustine, 2002).

Others argue that there should be a reformation of local land institutions to tackle the duplication of functions (Mwangi et al., 2006). Molen (2002) sees modelling the activities of institutions as a common policy issue that should be embraced to support land registration systems. Gikwa (2010) acknowledge modelling as a new approach towards improving the business services performance of Land Administration using workflow management systems.
Workflow management systems provide flexibility in modelling processes which facilitates land administration business services. However, its effectiveness depends on the interaction between technology and potential users within an institutional and cultural environment (Kurwakumire & Kuzhazha, 2015; Bennett & Wallace 2005). Workflow management system is seen as the means of improving data access through validation, confirmation and verification of documents leading to higher efficiency in land registration (Graham & Tim, 2016; Gabianu, Djaba and Andersson, 2006). This requires benchmark and feedback from users (Williamson, 2001; Simbizi, Bennett, and Zevenbergen, 2014). This means that understanding the use of workflow management systems in complex land tenure environment would ease the businesses processes of land registration.

Given the above, other researchers have proven the need to close the gap in land registration across the globe to ensure tenure security for all (Zevenbergen, 2002 ; Deininger, Ali, Holden, & Zevenbergen, 2008; Stig Enemark, Bell, Christiaan, & Robin, 2014 ; Lemmen, Oosterom, & Bennette, 2015). Recent research on 'Boosting land registration in support of SDGs' is an example (Zeeuw and Lemmen, 2017). However, most of these research is purely qualitative, centered on land registration in simple land tenure areas and has failed to examine the technical aspects of modelling land registration processes in complex land tenure environments like Accra.
Therefore, this research purposely seeks to model land registration processes using workflow management systems that facilitate a smooth flow of data between institutions and clients within the shortest time at the Lands Commission of Accra.
The output of the research will help permit the availability, storage, and search of data which stimulate economic development, promote social stability by improving the security of land tenure. It would also ease the process for accessing the transfer of land, and make it transparent, efficient, and hence develop the real estate market.

1.2. Research problem

The research problem is the multiplicity of activities and long procedures that affect land registration processes in complex land tenure environments. A literature review has proven that in some parts of Latin America, Africa, and Asia, these multiplicities of land registration procedures result in bureaucracy and duplication of functions which delay the business processes of land institutions. This causes a slowdown of investments and increases clashes over land especially in urban areas, like Accra.
This calls for a rethinking of modelling land registration processes to ensure efficient and transparent land registration using workflow management system.

1.3. Research Objectives

The specific aim of the research is to examine the processes of land registration in the complex land tenure system in Accra-Ghana and re-model the land registration processes to ensure an efficient and transparent land registration. The under listed sub-objectives would help reach this aim.

1.4. Sub-Objectives

1. To critically review the existing land registration processes in Accra-Ghana
2. To verify and integrate user requirements and stakeholder's contribution to Land registration processes in Accra-Ghana.
3. To re-design a workflow model showing the processes and activities of land registration institutions in Accra-Ghana and propose a recommendation for further actions

1.5. Research Questions

Sub-objectives 1- To critically review the existing land registration processes and activities in Accra-Ghana

1. What are the recognized land rights in the registration processes?
2. What are the bottlenecks involved in the registration processes?
3. What suggestion can be made to improve the land registration process?

Sub-objectives 2 - To verify and integrate user requirements and stakeholder's contribution in Land registration processes in Accra-Ghana.

1. Who are the potential users and stakeholders involved in Land registration?
2. What are the specific needs of users and stakeholders in the context of land registration?
3. What are the concerns regarding delays of the land registration processes from the users and stakeholders' perspective?

Sub-objectives 3 - To re-design a workflow model showing the processes and activities of land registration institution in Accra-Ghana and propose a recommendation for further actions

1. Which participatory institutions are involved in the land registration workflow?
2. What are the roles of participatory institutions in the land registration workflow?
3. What are the critical evaluation issues of the existing land registration workflow?

1.6. Conceptual framework

The general aim of the research is to ensure efficient and transparent land registration processes. The conceptual framework shows the synthesis of literature that reflects the direction and scope of this research. In this research, four critical issues were discussed. These include; land tenure systems, registration process modelling, land registration and workflow management systems.

The concept of complex land tenure system will be reviewed to figure out how various land tenure institutional activities that influence land registration processes. An expected outcome from the idea of registration process modelling will be, the technical ways of modelling the business processes to facilitate land registration.

The last concepts would review how workflow management systems are applied in land administration and the efforts being made to ensure efficiency in the businesses of land registration in Ghana.

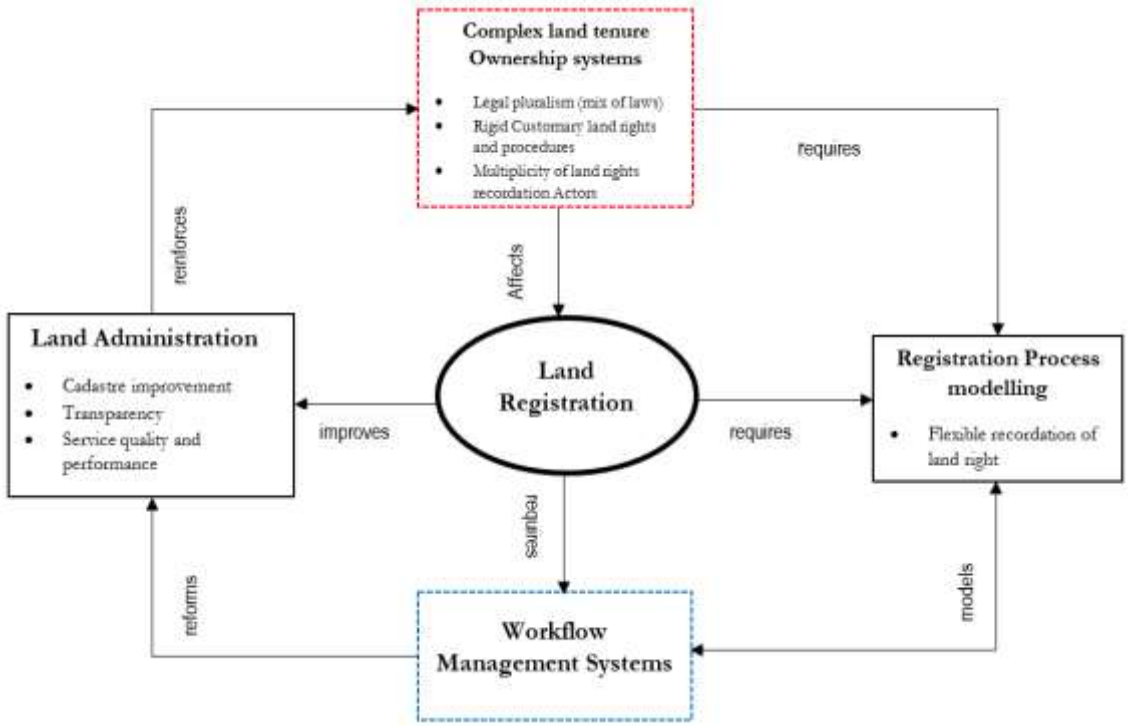

Figure 1 Conceptual Framework

1.7. Research Matrix

The research matrix shows the logical connections between the research objectives, theory, and the research design. For answering the research questions, semi-structured interviews and questionnaires were used to get data on the existing land registration process, workflow, and the user requirements. The research questions were operationalised with thematic land registration process themes which serve as the theoretical basis for enhancing discussions after the data collection from fields. The table below shows a summary of how the research was conducted.

Table 1 Research Matrix

OBJECTIVES	RESEARCH QUESTIONS	MODE OF DATA COLLECTION	SOURCE OF DATA	ANTICIPATED RESULTS
To critically review the existing land registration processes and activities of the land tenure institutions in Accra-Ghana	- What are the recognized land rights in the registration processes? - What are the bottlenecks in the land registration processes? - What potential suggestion to ensure full coverage of the land registration process?	-Summarised literature, Semi-structured interview/ Observation -Semi-structured interviews -Literature - Semi-structured interviews	-Land Title Registry -Survey and Mapping Division -Customary Land Secretariat -Land Title Registry -Survey and Mapping Division -Client Access Service Unit -Customary Land Secretariat -PVLMD & Survey	-Recognized land rights in Accra. -Land registration types in Accra. -Technical and administrative issues concerning the registration process. -Registration system improvements and efforts toward full coverage.

OBJECTIVES	RESEARCH QUESTIONS	MODE OF DATA COLLECTION	SOURCE OF DATA	ANTICIPATED RESULTS
To verify and integrate user requirements and stakeholder's contribution to Land registration processes	- Who are the potential users and stakeholders involved in Land registration?	-Semi-structured interview -Literature review -Clients	-Land Title Registry and Customary Land Secretariat - Questionnaire	-Category of users of the land registration system and stakeholders involved in the land registration process.
	- What are the specific needs of users and stakeholders in the context of land registration?	-Semi-structured interview -Literature review -Clients	- Land Title Registry and CSAU - Questionnaire	-Description of clients and stakeholders experience with the current land registration system.
	- What are the concerns on land registration processes from the users and stakeholders' perspective?	-Semi-structured interview -Literature review -Clients	-Land Title Registry, PVLMD, -Customary Lands Secretariat -Questionnaire	-Feedback from users and stakeholders on a perceived system improvement mechanism.
To re-design a workflow model showing the processes and activities of land tenure institution	- Which participatory institutions are involved in the land registration workflow?	-Semi-structured interview Literature review	-PVLMD, CSAU and Land Title Registry	A UML activity diagram and a workflow model showing the land registration process.
	- What are the roles of the participatory institutions in the land registration workflow?	-Semi-structured interview	-PVLMD, CSAU and Land Title Registry	Legally Specified roles of registration units/divisions in the processes.
	-What are the critical evaluation issues of the existing land registration workflow?	Semi-structured interview	-Survey and Mapping Division -Land Title Registry, CSAU	-Emerging issues relating to the land registration process.

1.8. Research workflow

The research workflow shows the steps involved in conducting the research. It involves the pre-fieldwork stage, fieldwork stage, and post-fieldwork stage

1.8.1. Pre-fieldwork

The pre-fieldwork involved the search for literature to enable identify a gap in cutting-edge research fields of land registration. This was followed by the definition of the study area based on the identified research gap in the literature. Research objectives and questions were defined based on the research problem.

1.8.2. Fieldwork

The field work includes the collection of primary and secondary data. Data were collected from the Lands Commission, Users (clients), and Customary Land Secretariat using semi-structured interviews and questionnaire. The techniques were based on the research objectives and questions. The secondary data on the field involved the collection of relevant published and unpublished land registration reports and Land Acts.

1.8.3. Post Fieldwork

The post filed work included desktop work. This involved analysis and processing of raw data collected from the field. This paved the way for the discussion of main concerns that rose from the analysis grounded in research objectives. Finally, the research closed with recommendations and conclusions for further future actions. The figure below shows the research workflow.

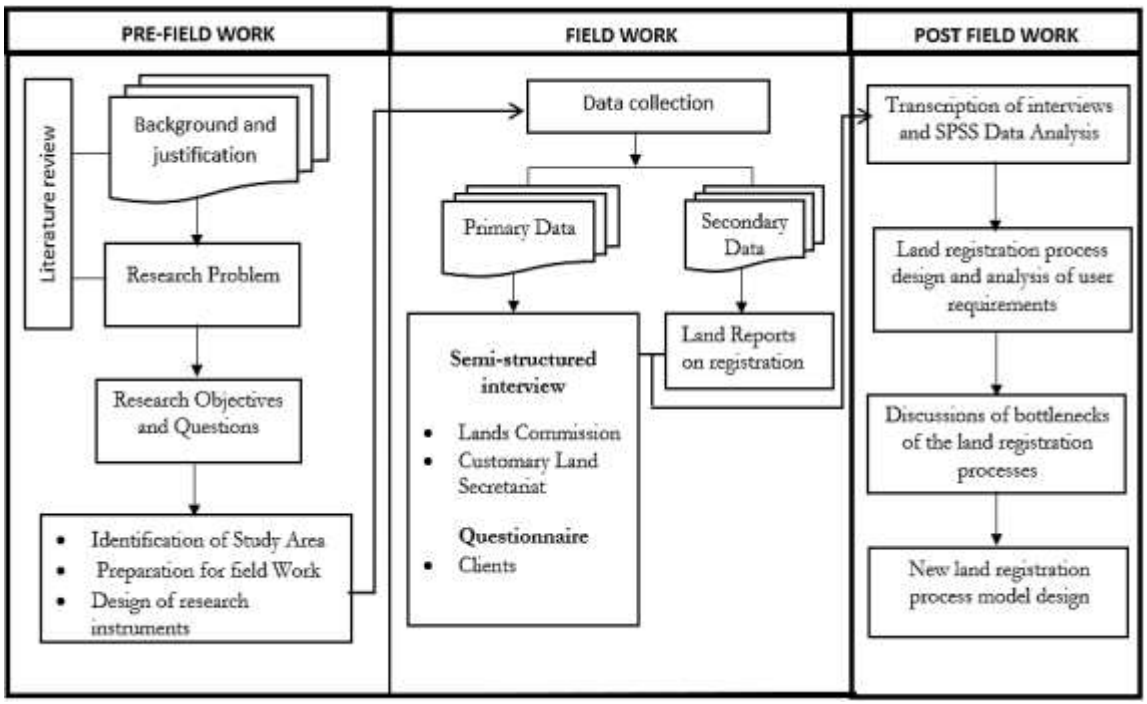

Figure 2 Research Workflow

1.9. Thesis Structure

Chapter 1. Background and justification

This chapter introduces the topic and justifies why the need to model land registration processes in complex land tenure system in Ghana. The chapter further presents the research problem, objectives, and research questions. The chapter shows the conceptual framework, research methodology, research design, research matrix and the mode of data collection and analysis.

Chapter 2. Literature review

Chapter two gives detail literature on the land tenure and land registration processes. It also highlights user requirements and stakeholder's contribution to enhancing land registration. The chapter reviews ways of modelling land registration processes using UML activity diagram and workflow management system. Furthermore, the chapter explains in-depth on how workflow management system is applied in land administration to enhancing land registration. The chapter finally, reviewed the efforts made in improving land registration in Ghana.

Chapter 3. Research Methodology

The third chapter gives detail of the research methods. This includes the description of both the qualitative and quantitative research methods adopted. It further explains how primary and secondary data were collected, presented, and analysed. The research further describes the mode of data collection, techniques, and data analysis. The chapter finally describes Accra (case study area) and the land registration system.

Chapter 4. Review of Land registration processes

This presents and analyse results collected from both primary and secondary data in chapter three. As part of reviewing the existing land registration processes in Accra Ghana, the chapter presents results on the land ownership and right types, role of land registration institutions, main institutions involved in the registration

processes, the land registration processes of various right in the land. The chapter further explains the emerging issues about the review land registration processes. The chapter finally presents results of user requirement on the respondent's perspective and the design requirements on the institutional perspective.

Chapter five 5. Workflow management design and implementation
The chapter describes in detail how a new workflow model would be designed and implemented in Accra Lands Commission. The detail description is based on the evaluation of rationale for change and validation of the remodelled land registration workflow. The chapter finally shows the implementation of the new model.

Chapter 6. Discussions
This chapter shows the discussions based on research outcome and literature about the concepts of the land tenure system and how its activities influence land registration. It further discusses the relationships that exist in the literature about the application of workflow management system in land registration.

Chapter 7. Conclusions and Recommendations
The concluding chapter summarises the whole thesis based on research outcome and proposes recommendation for further actions. It also suggests further in-depth research in the future based on the loopholes found in the research.

1.10. Summary of chapter one

The chapter introduces the research topic and justifies why there is the need to model land registration process in complex land tenure system environment. It further describes the research problem, research objectives and questions. The chapter further highlights the concepts behind the scope of the research in literature. Other contents include; the research matrix, research workflow and the thesis structure.

2. THEORETICAL FRAMEWORK

2.1. Introduction

This chapter focuses on the review of literature relevant to the research objectives. It explains the concept of land tenure and tenure systems, land registration, user requirements and stakeholder's effort in land registration, land registration process modelling and workflow management systems implementation in land administration. The literature further discusses the efforts made in ensuring land registration in Ghana.

2.2. Land Tenure

Adams, Sibanda, and Turner (2007) defines land tenure as the terms and conditions under which land is held, used, and transacted. Land tenure shows the institutional (political, economic, social, and legal) structure that determines who can own land (XinYang, 2014). This gives people the basis to make claims over land. The characteristics of the privileges to land and land resources usually depend on membership in broader social groupings such as extended families or lineages and other social networks (Christopher Udry, 1993). This forms a core component of human to land relationship which ensures responsible land administration (Mitchell et al., 2017).

Land tenure enhances and secure people's land rights and avoids arbitrary evictions and landlessness. According to UN-Habitat (2014), the guaranteed right is a prerequisite for providing shelter and realization of tenure security. However, Landowners can easily lose their right when they ignore tenure rules which affect the expected benefits of land registration that include; tenure security, eradicating poverty and increase in food supply (Rajabifard, 2007). To ensure equity, efficiency, and sustainability of tenure rules, it is necessary to identify the land tenure types accompanied by its institutions that ensure tenure documentation.

2.3. Types of land tenure systems

Cotula (2007) defines land tenure systems as institutions that regulate the bundle of rights existing over each parcel of land, including its operational rights and management rights. Zimmermann (1998) idea of tenure systems includes the tenure relationships that exist on more comprehensive property right system.
Land tenure system that exists over the globe can be classified as either a single or pluralistic system with a multiplicity of overlapping rules, laws, customs, traditions, actors, and regulations that govern the ownership, use, and transfer of land (IFAD, 2008). These systems are not mutable but are subject to a continual process of transformation (Bottazzi & Rist, 2012). Ghana's land tenure system is usually considered as one of legal pluralism in which for example; customary and statutory laws exist in a complex mix, and an array of institutions and regulations having authority over land rights and multiple institutions through which disputes are resolved (Adams et al., 2007).

Waiganjo and Ngugi (2001), categorized the interest in land held in this systems under two ways, i.e. a land right that is owned by traditional authorities (customary lands), and the land rights emanated from the English law backed by the legislature (national law). Payne et al. (2012) argue that, within many first tenure systems, each of that corresponds to key social and political systems, such as customary, socialist, religious or market economy of which such wide-ranging distinctions help to elucidate the nature of variations. Therefore, land tenure systems, in my opinion, are institutional frameworks within which the ownership and right to use land can be carried out under certain conditions which are associated with the socio-economic and political conditions of the location. This calls for the look at land tenure institutions and their forms across the globe.

2.3.1. Customary Lands

Paaga (2013), defines customary land tenure systems as systems whereby land rights are derived from customs and traditional practices handed down from generation to generation. The customs show the relationship of rights and ownership vested in a collective group (Mends, 2006). According to Payne (2015), this serves as a critical factor that grants people the right to transact in the land. Customary land is a major tenure system on a worldwide scale which operates more extensively in agrarian economies (Wily, 2012). However, Customary lands in sub-Saharan Africa region is characterized by the inherent uniqueness of

ownership groups (Krantz, 2015). Water Aid (2009) defines the groups as stools, skins, families, and clans that show the composition of customary lands held in trust by the chief, head of the family and clan or fetish priests for the advantage of members of that group.
Acceptable customs serve as legal requirements or binding rules of conduct and established patterns of behavior that can be objectively verified within a particular social setting (World Intellectual Property Organization, 2013). In Africa, very little customary lands have been registered (Cotula, 2004). Adams et al (2007) attributed the low coverage to lack of external guidance, elite capture, and opacity of the negotiation, insufficient consideration for loss of livelihood, poor inter-institutional coordination and accountability, limited community and capacity to contest rights infringements. Rakai and Williamson (1995), pointed out in their research that, poor coordination of institutions prohibit the success of a land information system development processes. Therefore, it is necessary to establish a hybrid land registration institution that accommodates all customary systems.

2.3.2. State and Vested Lands

State lands are lands owned by the state supported by legal provisions. State lands are characterized by limited right of use and efficient operation by government agencies (King & Sumbo, 2015). State lands compared to other tenure types have a common features because it is practiced by most countries in the world. Empirical studies show that Government of most countries compulsorily acquires land for state benefit followed by compensation to the affected owners. This is done by the power of eminent domain backed by legislative instruments (Larbi, 2008). This, therefore, means that the state does not necessarily own lands. They are intermingled with private lands (Jan, 2014). In developing economies, state lands are sometimes leased to private developers for investment housing. An example can be seen in Papua New Guinea (Chand, 2017).
However, Grover and Kingdom (2008); Manandhar, Joshi, and Ghimire (2016) indicates that state lands although has its benefits to the people but it is also entangled with problems of inefficient in land deals such as corruption, lack of management capacity and information. Therefore, Drucker (2016) suggest the use of blockchain to support the integration of institutions in land administration sector to cater for state land ownership problems. However, data governance and security may affect the system (Kang, 2017). Rajack (2009) argues that the transfer of state lands to private individuals improve land use through institutional reinforcement in delivering registration services.

2.3.3. Private Lands

Private lands are lands that are owned by individuals, organizations, families, and community. Private lands ownership in the world is the less owned land. RRI (2015) indicates that 5% and 13% of lands owned in Asia and Africa are private lands. Private lands in most of Africa countries emanated from customarily land ownership system. This is because as the economy increases the demand for land becomes high as such communal landholders delineate some of its lands to a private individual to own. Obeng-odoom (2014) shows that aside customary land ownership, private lands constitute extensive coverage in Ghana. Adams et al., (2007); Atilola (2010) and Plessis (2011) shows that most private lands were historically formed through land reforms. USAID (2007), puts that private lands are most efficiently used, but it often ignores the poor and limits state land management options such as land registration.

2.4. Land registration process modelling

This section gives a theoretical review of the land registration process. It further reviews stakeholder's contribution to land registration and how user requirements are enabled to ensure efficient land registration. It finally reviews how integrated land registration system is needed in complex land tenure environment.

2.4.1. Land registration processes

Nichols (1993) defines land registration as the official, systematic process of managing information about land tenure. Zevenbergen (2002) describes the processes as complex which involves at least technical, legal, and organizational aspects, which influence each other. One significant advantage of being an absolute or interim owner of land is by having a legal backing through the proof of ownership. The proof is through being either official documentation or indigenous ways. Research shows that securing land rights for the world has been challenging, but it is a feasible objective that can be achieved (Lemmen, 2015). Deininger and Gebre-selassie (2003) acknowledge (Soto, 2000) claim that when lands are registered, it gives people the

opportunity to engage in any investment venture. However, there have been positive evidence in Deininger, Ali, and Alemu (2009); (Deininger et al., 2008); Zevenbergen (2002) that, despite the sole benefit of land registration of an individual, it provides a positive economic benefit without even realizing its cost.
Land registration processes in some parts of the world have seen much improvement. In Moldavia, the agency of land relations and cadastral is solely responsible for registration of land using a cadastral that is multifunctional (PCC, 2016). Sweden has also seen much success in its registration processes through the merger of data and realigning of institutions and their functions (Vries, Muparari, & Zevenbergen, 2017). Others have the benefit of increasing efficiency, economic and technical gains through calibration and reduction of redundancy of functions. Realigning institutional roles in status and leadership according to EuroGeographics and PCC (2016) is likely to affect land registration in duties and workload. Some parts of Africa have seen some improvement by moving digital in land registration, for example, Rwanda and Uganda. In Kenya, data standardisation and data interoperability is still an issue facing the implementation of LIS (Mburu, 2017). Ghana's Land Administration Project merged all the institutions into four but resulted in some overlapping functions (Ehwi & Asante, 2016).

2.4.2. Stakeholders efforts in Land registration

Factions of land registrations are formed around landholding groups and multifaceted institution which deals with interlocking interest and rights in land involving state and land holding institutions. In Ghana, traditionally, usufruct rights are given to indigenes of the community. In the case of a sale, the process passes through the customary hierarchy such as elders through the Customary Lands Secretariat. Formal land registration process passes through long-chain scrutinize such as lawyers and surveyors at the Lands Commission (Barry & Danso, 2014).

Most empirical studies, however, have shown that the increased interest in the inclusion of stakeholders in land administration is essential infrastructure to many economies. Many initiatives by various stakeholders and international organization have contributed to the development of land registration over the years (Ghebru & Lambrecht, 2017b). International bodies such as World Bank, FIG, GIM, private and public agencies have taken the lead in ensuring sustainable land registration (Zeeuw, 2017). Most supported according to Malatsi and Finnström (2011) are; capacity building, workshops and, finance. Santos, Fletschner, and Daconto (2014); (Pritchard, 2013) argue that the success of this facilitation requires the long-term collective participation of the beneficiaries of the process. This reinforces the argument that the government is the only institution that has a legitimate role in facilitating the activities of land registration in every country. It is also recognized that public institutions find it difficult to coordinates its activities with landholding groups. According to Toulmin (2005), the long-standing struggle between the government and customary chief in Ghana over how land is transferred, used and revenue sharing, slows the facilitation process. These make it very difficult to determine the essential needs of the people. It, therefore, requires the inclusion of users to improve the complete process.

2.4.3. User Requirements in designing Land registration process

To ensure a sustainable land administration, Enemark, Bell, Lemmen, and Robin (2014) indicates that, the land administration should be built to meet the needs and benefits of the people concerning their relationship to the land. A well-functioning land registration processes are built around the organization's mandate driven by stakeholders and user's need (Kalantari, Dinsmore, Urban-karr, & Rajabifard, 2015). However, some land registration processes fail, like turkey where land registration project in the 1990s failed because stakeholders did not meet data infrastructure standards due to the failure to integrate user needs (Aydinoglu & Bovkir, 2017). User requirements serve as means of data gathering in the form of service quality, time, dissemination and storage for a well-functioning land administration (Didigwu & Olufisayo, 2016). User requirements are enabled by interviewing users and officials through collecting data in the form of rules, regulations, reports, complaints and recommendations of land registration (Thuy, Zevenbergen, & Lemmen, 2012). Research in Macedonia shows the use of questionnaires to gather data from both external source (NGO's), citizens and internal source (Government officials) to improve the business services of its Cadastral Organisation (Todorovski & Lemmen, 2007). The integration of user requirements in organisations system design leads to the performance of its business services and opportunity for further improvement in the existing system (Todorovski, 2006). It also enables to know the gap in the existing architecture and then help to translate this requirement into the system design. Lemmen, Oosterom, and

Uitermark (2013) argues that model building in support of the land administration domain model depends on user requirements that support land administration system implementation

2.4.4. Characteristics of land registration process model

Land registration facilitates all transactions concerning land, such as land development, and make transactions easier, faster, and more secure. However, the success of land administration of every nation rests on vibrant and coordinated land sector agencies. It has been proven that the collaboration of land agencies in the land administration has contributed to the effective and efficient delivery of developable land for housing (Muyiwa, Rajabifard, & Bennett, 2014). Steudler, Rajabifard, and Williamson (2004) argue that the definition of a well-structured objectives, strategies and evaluation of results of institutions support its performance. Simbizi, Bennett, and Zevenbergen (2014), therefore, suggested the need for modelling land registration processes to ensure a smooth land transfer hence ensuring tenure security. Tuladhar (2003) previously suggest this as the use of cadastral domain models.

However, according to Lemmen, Oosterom, and Bennett (2015), the model should have a shared ontology that ensures secure communication between actors through determining the required attribute and set of responsibilities. This constitutes the use UML diagrams and WFMS (Cristina Venera Geamba Ş, 2012 ; Chimhamhiwa, Molen, Mutanga, and Rugege, 2009 ; Mutambo, 2003). Tuludhar (2004) support this argument that the model should not only support land registration but should also help, alienation, valuation, transfers, and utilization of land at a faster time. The figure shows the concepts and the components of the model.

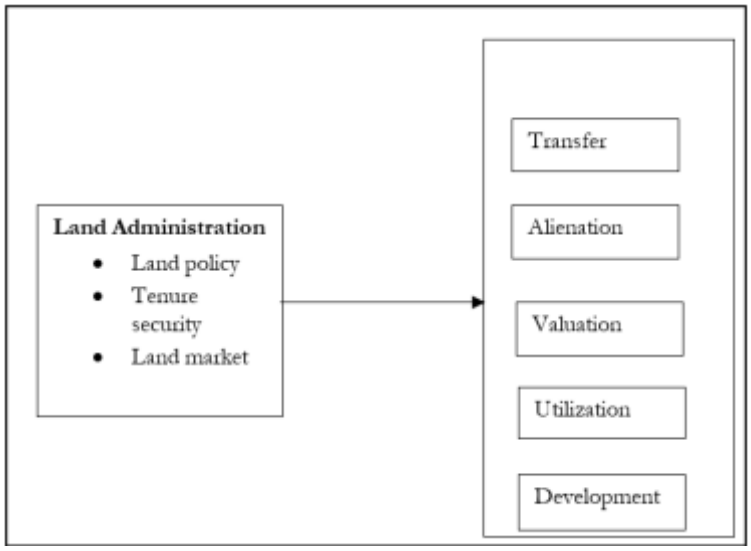

Figure 3 Concepts of Land Registration Model, adopted from Tuludhar (2004)

However, the need to evolve beyond traditional cadastral paradigms to embrace a fresh understanding of the relationship between land, property, and rights that support the benefits of land registration calls for a new paradigm (Grant, Williamson, Ting, 2004). Enemark et al. (2005) therefore developed a new paradigm that institutional registration arrangement can support land tenure, use, value, market, and development. Williamson, Enemark, Wallace, and Rajabifard (2008) refers to them as special tools in the Land Administration toolbox that leads to sustainable development. This shows that system designers need to take the extended benefits of land registration into consideration in realigning institutions and their functions in the system.

2.5. Workflow management system design and its implementation

This part discusses how workflow management systems have been applied in land administration sector. The section highlights some successes and failures in its implementation in other areas of the world.

2.5.1. **Workflow management system**

Workflow management system has been an engine for the smooth running of most organizations in the world. Rostanin (2017) defines workflow management systems as a system that helps to define, administer, and coordinate different business processes. Computer representation and logic drive its execution (Hollingsworth, 1995). The concept of workflow emanated from the business and manufacturing discipline. Today, this system according to Georgakopoulos, Hornick, and Sheth (1995) is used in diverse disciplines because, institutions are required to deal with global competition, reduce the cost of doing business, and rapidly develop new services and products. However, the restructure of organization makes it more productive and efficient (Chebbi & Dustdar, 2006 ; Georgakopoulos et al., 1995). It is very arguable that efficiency of the organization according to Dustdar (2017) is based on knowledge management that ensures competitive advantage and leverage that organizations enjoy in information management. However, according to Jecan (2008), it forms a comprehensive part of workflow management that enables people to search and hold information.

The implementation and use of workflow management in the land administration have gained much attention because of transparency issues governing the activities of land sector agencies (Phuong, 2015). It has seen some compelling results in its implementation in land administration (Osch & Lemmen, 2004).This is because workflow management makes information flow visible and predictable as such corruption do not have a straightforward relationship. There have been different means of developing workflow management. Phuong (2015) idea of workflow management shows the use of reference architecture in workflow management which is characterized by atomicity, isolation, consistency, and durability of data. He developed his workflow based on the data flow below.

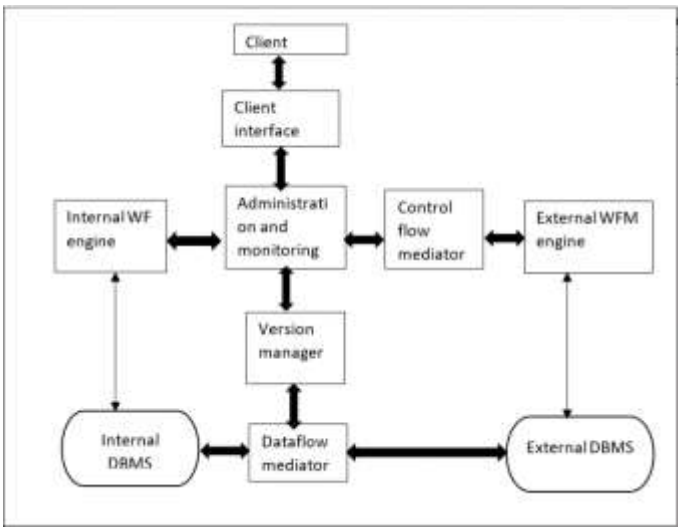

Figure 4 System Architecture Design Components, adopted from (Phuong, 2015)

The system can incorporate roles that need to be controlled by the manager in the central city. It is an oversimplification of workflow management from a more integrated perspective (Hollingsworth, 1995). However, to avoid ambiguity in the assignment of roles to individuals. Research according to Iden and Swenson (1996) shows that, due to the advance thinking of management organizations, it is necessary to abandon the old control of centralisation to a more decentralization of management with self-autonomy and self-control in checking the processes in workflow management. To ensure interoperability in the system, it is usually represented in a Petri net because according to Marinescu and Lafayette (2000) it represents set of resources that can act as a performer in various activities and also invoke or automate the process associated with each activity. Therefore system designers must be able to select variables applicable to solve the problems efficiently considering some assumptions in the future (Correia, Maria & Reis, 2017).

Lemmen (2017) indicates that the decentralization of transaction roles in the workflow makes the process faster. It depends on the nature of the chain of the activity diagram of the organization, transaction time and cost involved in the process (Kurwakumire & Kuzhazha, 2015). Goebl, Messner, Schwarzer, and Ag (2001) argue that the use of electronic data and routing the task makes transaction faster. The application of simulation models

in Reijers, Vanderfeesten, and Aalst (2016) has shown many improvements in estimating the needed time in processing information regarding processing, validation, and prediction of outcomes to ensure quick delivery of service. The assumptions were based on waiting time, lead time and service time of document processing. Greasley and Greasley (2006) classify it as a discrete simulation where the workflow policies, stated in Phuong (2015) a series of task that occurs through time.
The applicability of the workflow management system has seen much results in Sari (2010); Osch and Lemmen (2004); Lemmen (2017) and Dangol (2012) in its implementation and usage in land registration in other parts of the world.

2.6. Efforts in improving institutional performance towards land registration in Ghana

Land registration institutions in Ghana had undergone transition since independence. Schuppan (2009) idea of transition is not only focused on the question of digitalization, but also on the reorganization of participation processes based upon new ICT which includes; Internet technologies and internet-based applications, and also network technologies, databases, and electronic workflow systems. However, research from Sittie (2006) shows that some efforts have been made to computerize the work process of land registration in Ghana. Efforts from foreign donors have seen much efforts in ensuring a secure system of registration in Ghana through the implementation of the land administration project (Karikari, 2006). However, World Bank report in 2013 shows that it would be necessary to ensure institutional performance and legal framework for land administration system thereby decentralizing services closer to the client (World Bank, 2013).

2.7. Summary of Literature

In this chapter, basic concepts like land tenure systems, land registration, user requirement, institutional modelling have been described. The purpose of these concepts provides confidence in investors through housing and employment which eventually increase social stability and economic growth. It has been recognized that bureaucracy, a multiplicity of institutions and inadequate logistics affects land registration. Integrating the activities of land registration institutions have been identified in the literature as an issue of concern. Hence, various institutional and registration modelling mechanisms were recommended for example the use of UML and workflow management system to ensuring efficient and effective land registration. The sustainability and implementation of the system were identified as the use of models to achieve the system objectively. This research would add to the knowledge other factors that affect land registration processes in complex land tenure system. Based on that this study would develop a methodical approach towards an efficient and effective land registration using workflow management system.

3. RESEARCH METHODOLOGY

3.1. Introduction

Research methodology shows all system of facts of interrelated approaches and thinking that defines the inquiry a researcher wants to make about a problem (Creswell, 2003). This chapter discusses the methods used to conduct the research as well as topics necessary to the chosen methods when investigating into the land registration processes in Accra- Ghana. Through this discussion, the data collection and research analysis applied have been illustrated. These methods are addressed considering the fundamental research objectives and relevant research questions explained in chapter one. The sections include; research methods, Sampling techniques and mode of data collection, case study description, mechanism of data analysis, ethical consideration, and limitations of the field work.

3.2. Research Methods

The research method used includes both qualitative and quantitative approach. The qualitative approach was applied to examine the activities and functions of the land registration institutions, user requirements from the land registration institutions perspective and stakeholder's involvement in land registration activities using semi-structured interviews. The quantitative research method was used to examine the current system architecture (workflow) of land registration concerning data verification, processing, certification, and tax clearance. Perception of the clients concerning their concerns and level of satisfaction of the registration process were statistically analyzed. The purpose of choosing these research methods was to develop more understanding about the land registration processes through reviewing the existing land registration system specifically the workflow. This enabled to draw a comprehensive picture of how a new land registration process would be implemented. This method was achieved using purposive and simple random sampling techniques.

3.2.1. Research sampling techniques and mode of data collection

This section describes the types of sampling techniques used and the mode at which data was collected from the field. The mode of data collection on the field includes both primary and secondary data.

3.2.2. Primary Data

Currie (2005) defines primary data as data that is directly received from the source. The first part of this section explains the sampling technique and the mode of data collection applied to this technique. This research used a purposive sampling technique and semi-structured interview to get data on the Land registration process from the Lands Commission, clients, and Customary Land Secretariat.

3.2.2.1. Purposive sampling

Purposive sampling according to Latham (2007) means, selecting samples based on the specific knowledge of the people. The importance of availability and willingness of the participant to participate, and the ability to communicate experiences and opinions in an articulated, expressive, and reflective manner are characterised by purposive sampling (Etikan, Musa, & Alkassim, 2016). For this research, the Lands Commission, Town and Country Planning Department and the Customary Land Secretariat were purposely selected because they have much knowledge and experience about the land registration processes and the efforts made over the years. This was achieved using the semi-structured interview.

3.2.2.2. Semi-structured Interview

According to Jennifer (2011), semistructured interviews are characterised by fluidity and flexibility of the interviewee to enable the interviewer shape the unexpected theme of the interviewer. To ensure easiness of getting the required response, the research interviews were open-ended questions to enable easy interpretation and communication. The purpose of this method is that it permits the interviewer to find out more extensively new ideas that may come out of the interview (Bryman, 2012). Semi-structured interviews were focused on getting data regarding the land registration processes .i.e stool, family and public land registration processes and its challenges from the Lands Commission, Customary Land Secretariat

and the Twon and Country Planning Department in Accra. The table below shows the interview structure of the field work.

Table 2 Field Work interview structure

Organization	Place of organization	Number of interviews
Public and Vested Lands Management Disivion	Cantonment	3
Customary Lands Secretariate	Gbawe – Mallam	1
Customer Service and Access Unit	Cantonment	1
Lands Valuation Division	Cantonment	1
Lands Title Registry	Cantonment	1
Survey and Mapping Divison	Cantonment	2
Cartographic Department of SMD	Cantonment	1
Adminstrator of Stool Lands	Ministries	1
Ghana Enterprise Land Information System Unit	Cantonment	1
Town and Country Planning Department	Accra Metro	1

A total of 9 interviews were conducted at the Lands Commission, one at the Customary Lands Secretariat, the administrator of stool lands and the Town and Country Planning Department respectively as shown in table two above. The interviews were face-to-face with the officers of these divisions, except for the administrator of stool lands because he was on leave at the time of the field visit. The interview of the administrator was, however, by a phone call. All the interviews were conducted in both English and Twi, a local language. The local language enabled to get more clarity in the Land registration system requirements. The Lands Commission is a busy place as such two(2) directors assigned some of the staff to respond to the questions.

As part of the interview, the Land Title registry, Survey and Mapping division, Pubic and Vested Land Management Division, Client Service Access Unit and the Valuation and Estate Division were interviewed on the current land registration process, workflow, institutions and their roles , problems facing the processes and the suggestions that would help improve the process. Officers of the division were very interested in the research because they needed a technical and administrative recommendation to improve the process, as the Lands Commission has plans to introduce a Land information system in the future.

Similarly, to ensure full representation of respondent, the Customary Land Secretariat were also interviewed to find out their concern on the current registration process, their relationship with the Lands Commission regarding land documentation processes and the suggestions for an improved registration process. The Customary Lands Secretariat represents the stools and families regarding tenure documentation and land transactions in Gbawe Mallam. Because they deal with the people directly, they are mostly on site as such the interview were conducted on the free day of the director of the secretariat.

3.2.2.3. Simple random sampling

Simple random sampling according to Barreiro and Albandoz (2001), is a sampling approach where every person in the population has the equal chances of being selected. This approach was used to select clients in the principal towns of Accra to gather data on the perception and level of satisfaction of the land registration process and data on the user requirement from the clients. The purpose of this sampling techniques were applied to achieve the objective two of this research. Research questionnaire was used to achieve this technique.

3.2.2.4. Questionnaire

Research questionnaires are designed survey instruments that are distributed to targeted people to respond to questions of a particular research aim. According to Siniscalco and Nadia (2005), the questions should be standardized to expose each respondent to the same question. The reason for choosing this approach is that it is easy to administer, cheap and convenient to the respondent (Bryman, 2012). Based on the clustered

nature of the Accra, a sample size of 100, error margin of 10% out of a sample frame of 1431099 was used. *(see appendices for details)*. These are respondents who fall within the formal register. Twenty (20) respondent each were selected from 5 principal districts. These include; Ga West Municipal, Tema Metropolis, Accra Metropolitan, Dangbe West, and Dangbe East. However, ten (10) respondents were also selected in addition to the selected respondent. These are respondent who does not fall within the formal register. The questionnaire were structured list of close-ended questions. For convenience in answering the questions, the questionnaire were distributed directly to clients at their homes in the evenings since the study area is a busy place. The table below shows summary of the research questionnaire.

Table 3 Field Work Questionnaire Distribution Structure

Aim of Questionnaire	Summary indicators of Questionnaire	Number of respondents
To determine user requirements of the Current Land Registration System	-Types of land rights registered -Registration requirements -Time (months) for Land registration -Causes of delay in the land registration process -Land registration process stages that take longer (verification, processing, tax clearance and certification) -Suggestions for improvement	150

3.2.3. Secondary Data

Secondary data according to Church (2002), is a data that is collected internally or externally by the researcher first to gain an insight into the research problem. It is usually based on published data. The secondary information on the field involved a prepared report of previous meetings of the Lands Commission. Constitution of the Customary Lands Secretariat was collected to give an insight on the role of the institutions in the registration process.
The published online report and land documents related to land registration from Lands Commission were collected. The 2016 Land Bill, Lands Commission Act, State Lands, and Stool Lands Act were all downloaded from the internet to support the change of illegitimate registration processes.

3.3. Data Analysis and Processing

The data analysis and processing stage involved two steps. Qualitative interviews were transcribed using Microsoft Word and re-arranged by assigned codes in Atlas Ti Software to show systematic responses from respondents. The second step involved SPSS analysis of Client requirements in visualising data concerning client's perception on the current land registration system. The modelling tools used include:

1. Enterprise architecture. This software was used to analyze the current activities and roles of the land registration institutions using UML activity diagrams. The registration processes included; the stool, family, and public lands registration process. UML activity diagrams were used to design and analyse the land registration processes and its bottlenecks.

2. Process maker software. This software was used to design and implement a new workflow model showing how information flows within each division of the Lands Commission and its stakeholders.

3. PgAdmin III software. This tool was used to design the database showing the records tables of the modeled land registration process. The flowchart below shows the analysis and modelling process.

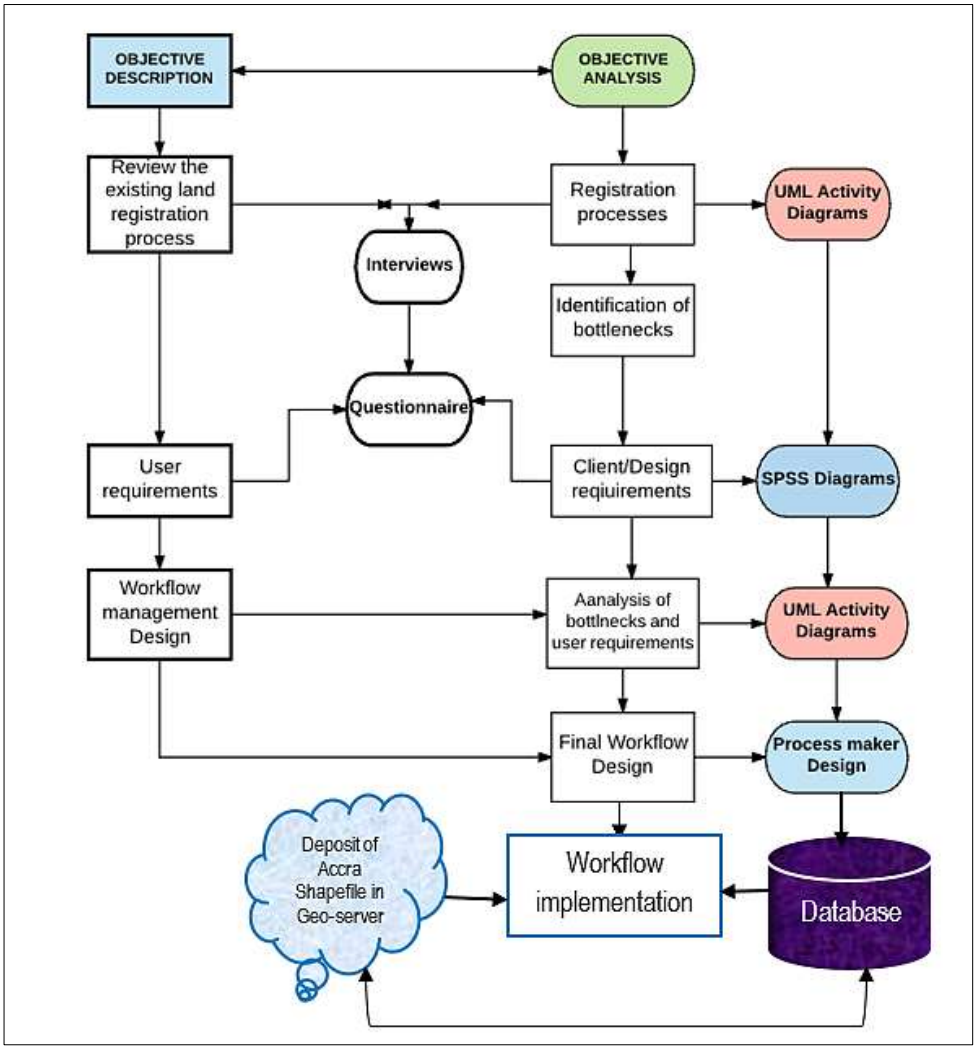

Figure 5 Data Analysis and Modelling Processes

3.4. Case study description and Land registration in Ghana

3.4.1. Case description

The research was conducted at greater Accra, the capital city of Ghana. Greater Accra is among the ten regions of Ghana. Official Statistics from 2010 housing and population census shows that it has an area of 3,245 square kilometers or 1.4 percent of the total land of Ghana and a population of 4,010,054 (Ghana Statistical service, 2012). Today, it is very much a cosmopolitan city. Traditional authorities, families, and state own lands in Accra. The traditional authorities include; Ga, Mashi, Osu, La, Teshie, Nungua and Tema all held by communities and managed on their behalf by authorized representatives. Traditional authorities for some communities are represented by their chiefs (*Mantsemei*), fetish priests (*women*), quarter heads (*akutseiatsemei*) and family heads (Tipplea Graham, Korboeb David, 1999).

However, there are some localities where stools gain the rights to allocate land to private individuals (particularly in Labadi). The traditional authorities have several towns having several family homesteads. Also, some group of towns is controlled by chiefs to serve behaviour and the administrations of lands under their authority as legal in them (Arko-adjei, 2006). For example, the activities of Gbawe stool is administered by the Gbawe Customary Land Secretariat. Most family heads have equally remained in control of their land. According to Arko-adjei, Jong, and Zevenbergen (2009), pressure from forces of modernization that is transforming traditional society to capitalist has forced family heads and chiefs in Accra to dispose some of their lands to government and individuals through sale or lease. Many other rights in the land have carved

from collective land ownership. The most common among them being the common law freehold as well as short and long-term leasehold.

As a sprawling city, stress on urban management has become a problem leading to delays in land registration and development. It is therefore based on the complex nature of the land ownership system and land transaction processes that this area was selected. The results from the field can be applied to the whole country because it is the area with more complex system of land ownership and land registration issues in Ghana. Figure 6 shows the case study area.

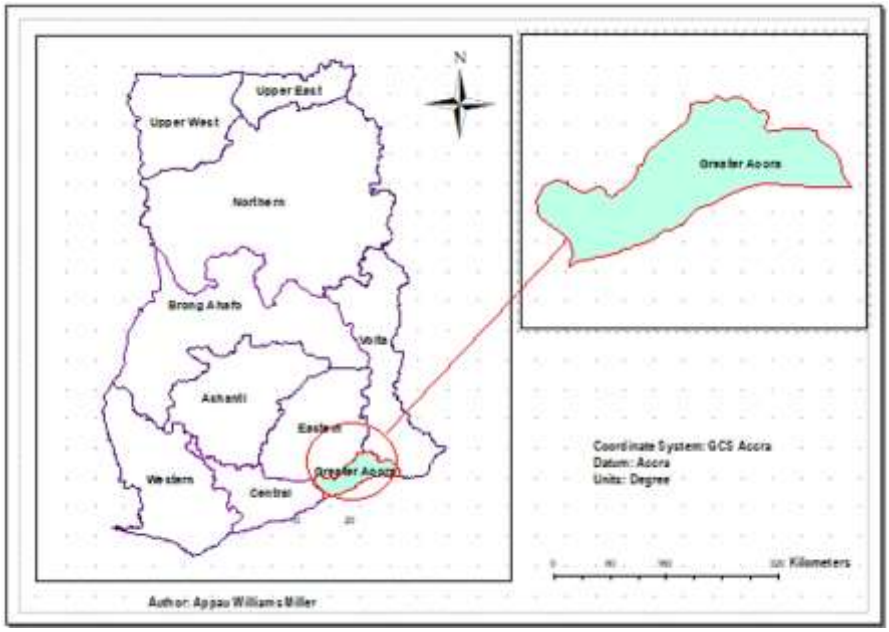

Figure 6 Map of Study Area

3.4.2. **Land registration system in Accra**

The land registration system in Accra involves the interaction between clients, Lands Commission, and its external stakeholders. The external stakeholders include the Customary Lands Secretariat, Town and Country Planning Department, Office of the Administrator of Stool Lands, and private surveyors. However, article 258 of the 1992 Constitution of Ghana Amended through 1996, gives the Lands Commission the mandate to integrate the Survey and Mapping Division, Land Title Registry, Lands Valuation Division, Public and Vested Land Division as part of policy recommendation. Initially, the Public and Vested Lands Division was formally responsible for deed land registration until 2007 the Lands Commission declared some parts of Accra as Title registration districts.

The purpose was aimed at giving certainty and proof of absolute ownership to land in a safe, cheap, and secured manner thereby improving land management. The Land Title Registry is responsible for providing titles to lands. The land registration Act 122 of Ghana gives the Registry the right to register any interest in land. Stool and state land Act of Ghana describe the institutions responsible for registering stool and state lands.

However, family lands have no laydown family land laws as such family land ownership is not secured, hence the double sale of lands, boundary disputes, and conflicts. The Survey and Mapping Division investigates and prepares cadastral plans on which plotting of parcel coordinates are done to assist the Land Title Registry to issues land title certificate. The Survey and Mapping Division interacts with the Land Title and Public and Vested Lands Division in delivering survey search and mapping request. Nevertheless, the process is manual and involves firstly, to contact the traditional landowners and the Customary Lands Secretariat to begin land recordation processes with final registration at the Lands Commission. The complex nature of land ownership and registration processes require detail background checks before purchase and registration of lands to avoid the double sale and land disputes in Accra.

3.5. Ethical consideration

Ethical consideration according to Walliman (2011) refers to the application of the researcher values relating to honesty, truthfulness, and personal integrity during the data collection process. This means that it is imperative to seek the consent of the people before conducting the interview. It is necessary because the results of the research could be evaluated against the cost when the researcher acts unethically. The data collection process of this research sacked the concern of interviewees on the use of a recording tool, description of respondent's parcels and registration detail. Because of the culture of Ghana, use of polite words like *"if you please", "I would be glad if you"* were used to entice respondent for vivid information. However, some officers who were not allowed to be recorded because of security reasons were respected.

3.6. Limitations of the field work

1. Financial constraints. The allowance taken to the field was not enough to cater for transportation and accommodation. This is because the exchange rate in Ghana as predicted earlier changed as such affected the researcher's projections on transport fares and accommodation. Considering the movement of long distances to some parts of Accra to distribute the questionnaire, affected field expenditure. This led to increase in the researcher's expenditure.

2. Time limitation. The three weeks for the data collection was not enough. The arrangement of interviews took the researcher five days (5) because most of the officers of the Lands Commission were very busy. The Administrator of stool lands was on leave as such it was challenging to get consent to interview the Gbawe Customary Lands Secretariat. The questionnaire administration also took most of the time as some residents of Lapaz and Adenta were not willing to respond to the questions because they were tired from their regular duty.

3. Declaration of respondent details. Although ethical issues were considered but were very difficult on the part of some respondents to declare their parcel details. They were afraid of security of their details because of the act of double sale of lands in Accra. This was very difficult to cross tabulate to know where most of the response according to the respondent's details in the SPSS analysis.

3.7. Summary of methodology

The research was conducted in Accra, the capital city of Ghana. The research used both qualitative and quantitative research methods using semi-structured interview and questionnaire data collection techniques. The results were analysed using Atlas Ti, Microsoft word. Tools used include; the enterprise architecture and process maker.

4. LAND REGISTRATION PROCESSES REVIEW IN ACCRA-GHANA

4.1. Introduction

This chapter presents results and analysis required for the design of an integrated land registration workflow model. Section 4.2 of the chapter critically reviews the Land registration processes in Accra. The review process introduces and analyses the land ownership types, land rights recognized in the registration process, types of registration processes and its bottlenecks. Section 4.9 of the chapter finally, explains and analyse the user requirements vis-à-vis the land registration processes.

4.2. Review of the Land Registration processes in Accra

The land registration processes in Accra begins with the identification of the land ownership type and the land rights held in these ownerships. Section 4.3 analysis the institutions responsible for registering each land ownership type. The discussion below explains the type of land ownership, type of land right, the land registration process and its bottlenecks that need further improvements.

4.2.1. Types of land ownership in Accra

Lands required by the Lands Commission Act 2008 to be registered in Accra include; Public and Vested lands, Stool lands and Family lands.
Table 4. Types of Land Ownership in Accra

Type of Land Ownership	Description	Key differences in registration requirements
Public and Vested Lands	The Public and Vested Lands are lands owned by the state. The vested lands are part of the public lands held compulsorily by the state for developmental projects or held in trust of a stool and family when there are disputes and conflicts over the land. Vested lands compulsory acquired by the Lands Commission of Accra are not registered until a court declaration (figure 7).	Public and vested lands registration demand recordation of land right through the application for the concurrent letter. The concurrent letter shows the request of an applicant to purchase public land. This enables the applicant to continue the registration process.
Stool lands	Stool lands are lands owned by a stool on behalf of a community. There are more than 65 stools in Accra controlled by chiefs and their principal elders. Chiefs and their elders account to the beneficiaries of the stool when there is a sale of land. The chiefs delegate their spatial powers to the Customary Lands Secretariat. Customary Land Secretariat disburses 40% of its annual fees received from stool lands recordation for the maintenance of the stool, 50% for the CLS operations and 10% for Community Development Projects respectively. Every stool has a committee	Stool lands registration requires the recordation of land right, note of proposal, provision of consent letter for registration. Stool lands are "noted" purposely to keep track of an applicant registering stool lands. This is to avoid double registration of that stool.

Type of Land Ownership	Description	Key differences in registration requirements
	represented by chiefs, elders, Town and Country Planning Officers and the Customary Lands Secretariat about issues of Land right recordation and transfer issues (figure 7).	
Family Lands	These are lands owned by family groups in Accra. The family heads manage these lands on behalf of the family members. Currently, there are more than 178 families owning lands in Accra. However, new families emerge over time when there is a division within a family (extended family to nuclear family). This creates land conflicts between families during land division hence creates a rejection of land documents at the registration point (figure 7).	Family lands are directly registered after the recordation of land right. Family lands do not need the note of proposal and issuance of the concurrent letter. The reason behind this is that the disposition and management of family lands are not enshrined in the laws of Ghana. Therefore, family lands create lots of clashes between land guards *(private security to family lands)* and people. This creates strict assessment of required documents by the Legal Department of Lands Commission, to avoid double sale of lands.

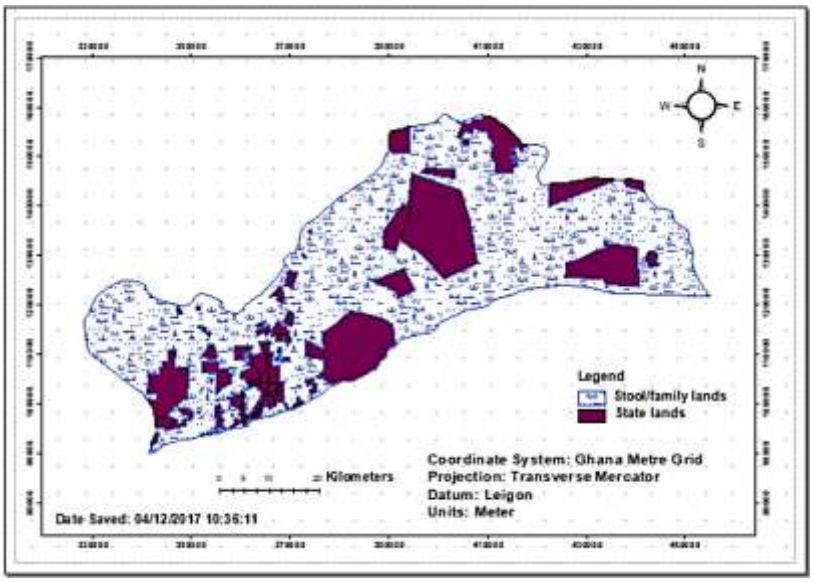

Figure 7 Land Ownership segmentation

Family and stool lands change over time except for public lands. Field visit also shows that there is the mixture of family and stool lands. This fashions problem regarding the names recognized in the formal register. Currently, the Lands Commission of Accra is yet to recognize the ownership of Alrotech Company (family sold land) and Bortianor stool, because there is conflict over the ownership of Bortianor lands. This suggests that where there is mixed land ownership, it is difficult to speed the registration process because names of parties necessitate changes in the registration system regularly. Therefore, it is necessary to examine how mix land ownership system can be regulated in the registration system.

4.2.2. Types of land right recognized in the registration process

Land rights are rights held in a stool, family, and state that enables an individual or a developer to exercise ownership for a recessionary period. Registered land right holders enjoy the right for a specific term depending on the right type. The land rights recognized in the land registration process in Accra include; leasehold, freehold, allodial title, assignment, and sublease. Land rights acquired from the landowner(s) by a purchaser does not guarantee the individual or developer the full recognition of ownership unless the right is registered. The land rights are explained below.
Table 5 Recognize Land right in the registration process.

Land Rights	Description	Percentage of registered lands right
Leasehold	These are rights held in either a stool or family land to an individual to occupy and use a parcel for a specific period. Registration of stool lands requires the payment of ground rent to the stool per annum to keep their land right running.	58%
Freehold	Freehold Land rights are held in a stool or family landholder in perpetuity as where the name (s) of the stool or family is acknowledged by the administrator of stool lands in Accra. Lands given by gift to people are registered on a freehold right. Families who register all their parcel at 'a time' are registered by the Lands Commission as a freehold right.	7.3%
Allodial Title	The allodial land rights are given to the first settlers of vacant land. Allodial right is recognized as the highest land right by law when a family or stool assume to be the first settlers of land without encumbrance. However, this right is no more registered at the Lands Commission because there are no first registrations for such lands since Accra is a cosmopolitan city. Therefore, these allodial land right holders have been established into either a leasehold right, freehold right, sublease, and assignment.	0
Assignment	Assignment are rights given by a leaseholder to an individual to enjoy the unexpired term of the leaseholder. Assigned rights held under stool lands demand the payment of ground rent to the stool irrespective of the unexpired term during the registration process.	20%
Sublease	These are land rights assigned to individuals to enjoy the unexpired term of an assignor. The sublessor pays the ground rent of the original leaseholder for the unexpired term during registration.	14.7%

From table 5, it is recognised that the leasehold, freehold, sublease, and assignment are the collective land rights that are registered in Accra. These land rights can be registered either in a stool name, family, and state except allodial title right which is no more registered. Field survey of 150 respondent shows that 58% of the registered land right is leasehold, 7.3% are freehold, 14.7% to sublease and 20% to assignment respectively. This indicates that there are few perpetual land right holders (freeholders) in Accra and as such, there is the likelihood of an increase in leasehold, sublease, and assignment land right registration in Accra. From the analysis, it can be proven that land rights do not alone determine the registration process, but the category of land ownership that holds the right.

4.3. Land Registration Processes

The land registration system in Accra is manual, which involves the family, Stool, and Public/Vested Land registration processes. The rights held in lands are only registered but not the property affixed to it. The registration stages technically involve the verification, processing, certification, and tax clearance. Lands Commission of Accra is the institution responsible for land registration in Accra. However, other stakeholders such as the Customary Lands Secretariat and Town and Country Planning Department assists in the documentation and determination of land right and land use. The Lands Commission constitute; Public and Vested Lands Management Division (PVLMD), Clients Service and Access Unit (CSAU), Lands Valuation Division (LVD), Administration Unit (Records Department), Survey and Mapping Division (SMD), Legal Department, Land Title Registry (LTR) and the Universal Merchant Bank (UMB). These actors perform unique roles depending on the type of land registration.

4.3.1. Land Registration Processes of Stool Lands

Registration of land rights held in stool lands is registered by the Lands Commission and its stakeholders (external actors). At the Lands Commission, the process passes through the Public and Vested Land Management Division, Customer Service and Access Unit, Land Valuation Division, Administration Unit, Survey and Mapping Division, Land Title registry, and the Legal Department. The stakeholders include the Clients, Customary Land Secretariat and the Town and Country Planning Department. Figure 8, and the discussions below describes the role of each institution in the stool land registration process.

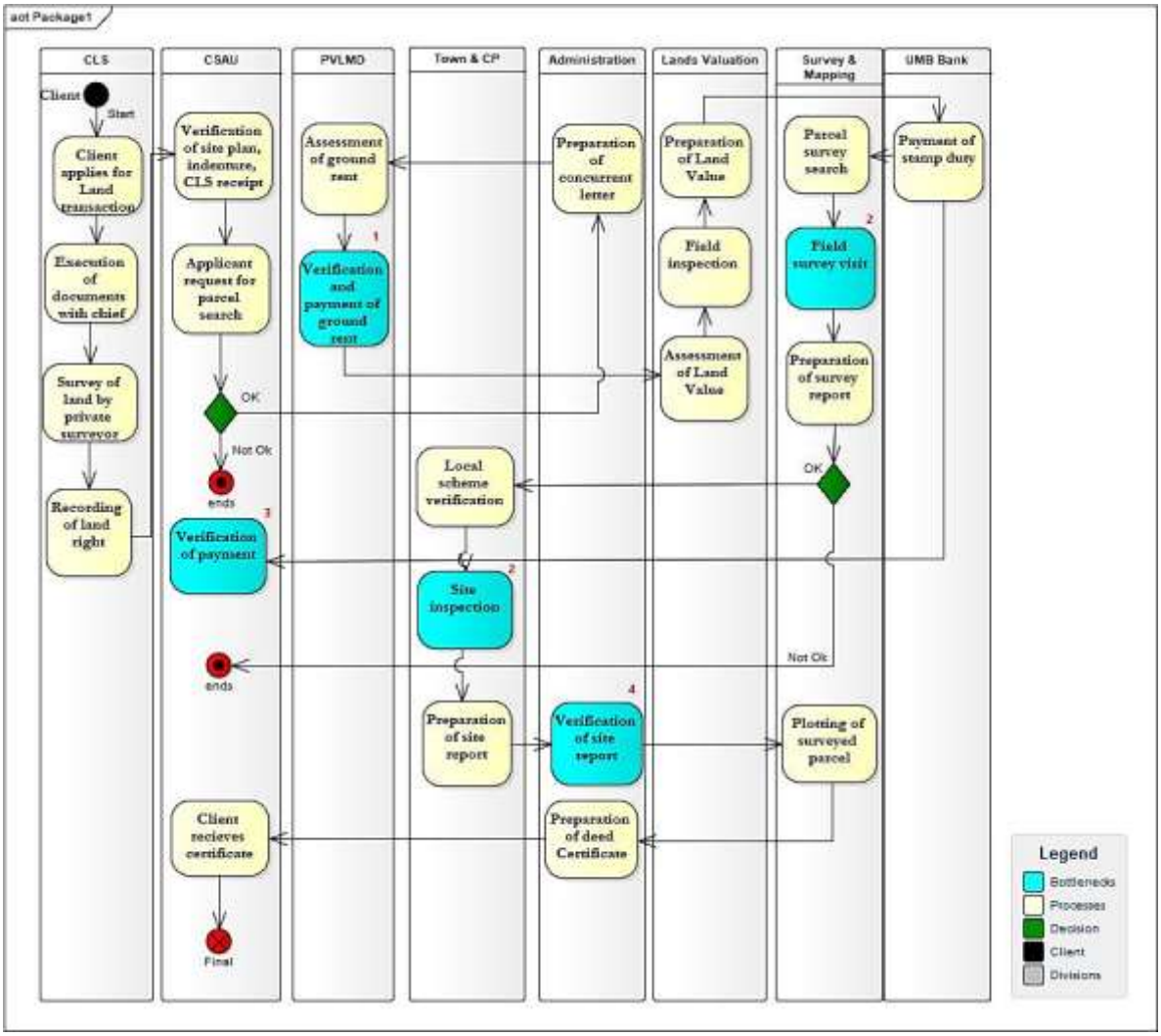

Figure 8 Stool Land Registration Process

- **Citizen (Client)**

Client (s) with purchased stool land starts the processes from the Customary Lands Secretariat and complete the processes at the Lands Commission and Town and Country Planning Department. At the Lands Commission, clients interact mostly with CSAU and PVLMD to note their proposal and ground rent. This is because the PVLMD manages stool lands through the office of the administrator of stool lands.

- **Customary Land Secretariat**

The Customary Lands Secretariat is a key stakeholder responsible for documenting land right held in stools and family. The Office of the Administrator of stool lands supervise the activities of the Customary Lands Secretariat. At the CLS, Client (s) complete a land right record form indicating; the name(s) of the applicant, address, number of plots (parcels), amount of purchase and the purpose of recordation. The form is submitted to the elders and heads of the stool to sign. The elders request a private surveyor to survey the parcel.

The output from this secretariat is a land receipt and a survey site plan indicating the conferment of right by the stool to the party. The site plans are sent to the Client and Access Unit of the Lands Commission to continue the registration process.

- **Customer Service and Access Unit**

The Client Service and Access Unit is a new division set up by the Lands Commission of Accra in 2016. This unit is not backed by law but was a recommendation of the Land Administration Project to re-engineer the business processes of the Lands Commission. The CSAU is responsible for assisting clients in the registration of stool lands, family, and public lands. When a client submits the site plans from the Customary Lands Secretariat, the CSAU requests the applicant to fill a form indicating the purpose of the registration and the type of registration.

Upon completion of the form, the CSAU requests PVLMD to prepare a proposal showing the registration of that stool. The CSAU further requests the Survey and Mapping Division to conduct a parcel search through the verification of site plans and the application forms. The purpose of the search is to figure out whether the parcel has been registered in the name of a different client.

- **Survey and Mapping Division**

The Survey and Mapping Division is responsible to supervise, regulate and demarcate parcel for land registration in Accra. When the Survey and Mapping Division receives a request from CSAU for stool lands search, the Survey and Mapping Division looks at their map through the comparison of the surveyed site plan submitted by the applicant with the already registered ones. The SMD assigns a unique number to the searched site plan. This is called barcoding at the Survey and Mapping Division.

Upon complete search, the Survey and Mapping Division notifies the CSAU to assist the applicant in requesting for parcel value assessment and stamping at the Lands Valuation Division.

- **Lands Valuation Division**

The Lands Valuation Division receives a request from the Customer Service and Access Unit to value stool lands. Lands Valuation Division assesses and assign a value to the parcel and hands it over to the applicant to be sent to the Client Service and Access Unit. The assessment involves the verification of site plan duly signed by both parties, survey search results, and date of consideration. It is essential to ensure that the details of the site plan correspond with the indenture, signed by the solicitor and an oath from the court. Client Service and Access Unit request the applicant to pay the stamp duty at the Universal Merchant Bank. Personal dedication and logistic control affect the functions of the Lands Valuation division, hence delays in parcel value assessment.

- **Universal Merchant Bank**

The Universal Merchant Bank is an institution responsible for receiving all fees of the Lands Commission of Accra. The UMB receives a bill from the applicant in the form of receipt indicating the stamp duty fee. The output of this bank is a receipt indicating the payment of tax. The client submits it back to the Client Service and Access Unit to verify whether payment has been made. The Client Service and Access Unit sends the survey site plan, search report, and the stamp duty receipts to the Public and Vested Land Division to assess ground rent and note a proposal indicating the registration of that stool.

- **Public and Vested Land Management Division**

The Public and Vested Land Management Division is a division within the Lands Commission of Accra responsible for managing and facilitating stool and public land registration. The law does not spell out the processes of registration. The land bill 2016, gives the Public and Vested Land Management Division the legal right to create an account where all ground rents are deposited and shared among respective land-owning groups. The Public and Vested Land Management Division receives a request from Client Service and Access Unit to verify and assess ground rent.
The Applicant is requested to pay ground rent to the Public and Vested Land Management Division. The output of this process is a receipt indicating the payment. The applicant is requested to submit the receipt to the Administration unit of Lands commission.

- **Administration Unit**

The Administration Unit of the Lands Commission records and plots stool lands. The Unit has been responsible for plotting stool lands since the declaration of Accra as a Title registration district in 2007. The Administration Unit receives a request from the Public and Vested Land Management Division to note a proposal (concurrence to land) of the registration of an applicant's land right.
The purpose of the concurrence is to note that the applicants right in land are under registration. This is to avoid double registration of the same parcel. The applicant sends the concurrence to the Town and Country Planning Department to continue the process.

- **Town and Country Planning Department**

The Town and Country Planning Department prepares mapping schemes and control developments in Accra. Town and Country Planning Department by law grants building permits to individuals and developers. A request submitted by an applicant from the Administration Unit of Lands Commission is verified to check their Local cadastre scheme whether the surveyed site plan falls within the mapping scheme. This is done through a site visit.
Upon complete search, the Town and Country Planning Department notifies the Client Service and Access Unit to continue the plotting processes at the Survey and Mapping Division. The Survey and Mapping Division verifies the scheme report from the Town and Country Planning and issues a request to the Cartography Department for map plotting. The client picks the plotted deed certificate at the CSAU.

4.3.2. Analysis and Bottlenecks of Stool land registration processes

From figure 8 above, it can be analysed that the stool land registration process involves a lot of steps. However, the following bottlenecks have been identified that hinders the registration process.

- Deliberate verification and received of ground rent by PVLMD *(see bottleneck 1)*. Figure 8 shows that; the Public and Vested Land Management Division performs the function of the Universal Merchant Bank in the collection of fees. The Ghana Land bill 2016 (part two), gives the Public and Vested Land Management Division the mandate to assess ground rent but not to receive ground rent. However, it mandates the division to create a bank account where applicants would directly pay all ground rents.
  This delays the process because payment of all fees can be made at the Universal Merchant Bank.
  This, therefore, can be analysed that, received of ground rent by the PVLMD is due to the failure to monitor the responsibilities of each division of the Lands Commission. This bottleneck directly delays the process and indirectly affects accountability to various stools regarding the amount of ground rent each stool receives.
  An explanation to remove this bottleneck is because stools do not invariably emerge over time, one account can be created at the UMB where applicants can pay the ground rent in the name of all the 65 stools in Accra to reduce the processes.

- Double parcel site visit and inspection by Town and Country Planning and Survey and Mapping Division (*see bottleneck 2)*. This creates conflicting site plans based on multiple field visits and inspection by Town and Country Planning and Survey and Mapping Division instead of one visit. The Town and Country Planning Department is responsible for assessing and giving building permits to developers. This is usually done through a field visit to determine the position of the building. For verification of stool lands, local map schemes are by principle, needs to be printed at the office to enhance assessment of parcel search by an applicant.

However, these are not done but visit the field for inspection. Updated local cadastral planning schemes can remove the processes of field visit except on exceptional cases such as the construction of building on the site and survey.

- The Client Service and Access Units' task of verifying paid stamp duty by the bank delay the process instead of the bank forwarding it directly to the Survey and Mapping Division *(see bottleneck 3)*. The CSAU is responsible for serving as one-stop-shop in the registration process. In general, it was observed that the CSAU exceed its powers of verification of documents. Stamp duty paid at the Universal Merchant Bank could be directly forwarded to the Survey and Mapping for plotting but not back to the CSAU for verification.
  The CSAU can in principle be notified when there is an indication of non-payment of stamp duty at the Survey and Mapping Division. This makes the process redundant and delays applicants time. This is because the survey and mapping division would equally check these receipts.

- Redundant verification of local scheme report through the Administration unit to Survey and Mapping Division and back to Administration Unit instead of directly from the TCPD to Survey and Administration for map plotting *(see bottleneck 4)*. Applicants technical report from the Town and country planning is required to be directly submitted to Survey and Mapping Division for cadastre plotting. The Administration unit checks the report to verify in their records the correlation of the schemed sites to their records.
  Plotting of site plans by the Survey Division can equally verify the report from the TCP Department. This bottleneck can be explained that the TCP and the SMD use field visit to get money through the preparation of field inspection report even if there is no evidence of inconsistency in stool land use determination which may delay the process.

- Double plotting of survey parcel by the PVLMD and the Survey and Mapping Division. By law, the Survey and Mapping Department is responsible for parcel mapping. Information shows that the survey and mapping division and the Administration Unit can perform parcel plotting of stool lands because there is no complete transition of plotting of surveyed stool lands from deed system to title system since 2007.
  This has the likelihood of double registration hence, where the Survey and Mapping Division fails to conduct a parcel search early, a client who plots his land first at the administration becomes an owner. This can be explained that there are duplication and lack of synchronization of plotting stool lands with no added value which has an effect of creating conflicts.

4.4. Land Registration processes of family lands

The Lands Commission equally registers family lands. The actors responsible for this process include; Customary Lands Secretariat, Customer Service and Access Unit, the Legal Department, the Lands Valuation Division, Survey and Mapping Division, Land Title Registry. The Public and Vested Land Management Division and the Administration unit of Lands Commission does not form part of the institutions responsible for family lands registration. Figure 9 and the analysis below show the roles of each of the division in the registration processes.

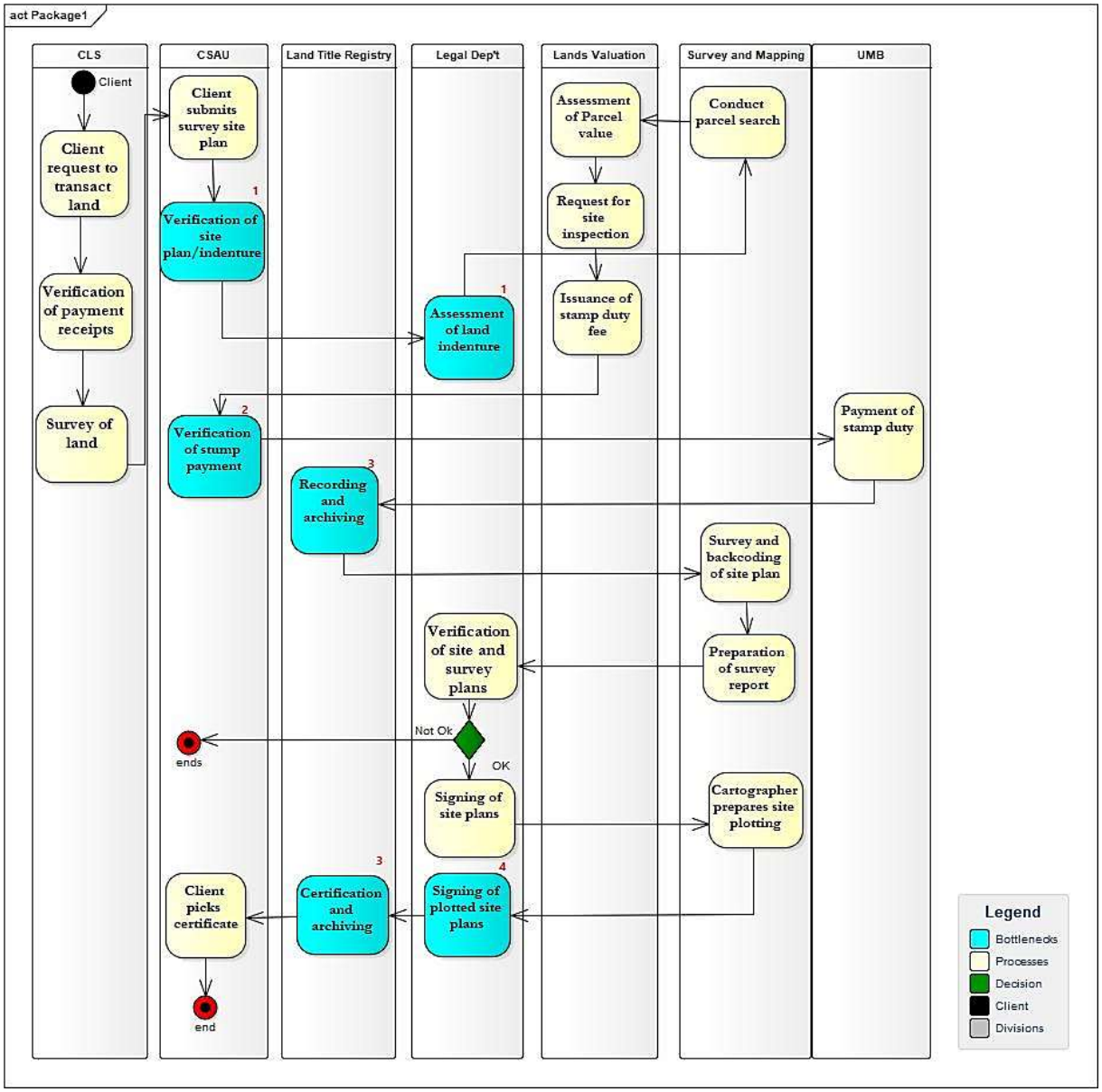

Figure 9 Family Land Registration Process

- **Client**

Client(s) submits parcel site plan of the purchased family land to the Customary Lands Secretariat to record their land right. Client (s) further submits the recordation receipts to the Lands Commission and the Town and Country Planning Department to complete the process.

- **Customary Lands Secretariat**

Applicant request to complete parcel transaction at the Customary Lands Secretariat. Client complete application forms are indicating the family name(s), where the land was bought, names and signatures of the principal family heads. This is to enable the Customary Lands Secretariat to determine whether the family

land has disputes or conflicts. The Applicant is made to pay recordation fee at the Customary Lands Secretariat. The Customary Lands Secretariat makes a survey request to survey the parcel. The client sends the survey site plan and the payment receipts to Client Service and Access Unit to continue the process.

- **Customer Service and Access Unit**

The Customer Service and Access Unit receives a request submitted by the applicant to conduct a survey parcel search. The output of this process is a search form indicating the details of the applicant and the survey site plan.

- **Survey and Mapping Division**

The survey division receives a request form from the Client service and Access Unit indicating the request by an applicant to conduct a parcel search. SMD searches by examining the map bearings, acreage or hectors of the parcel, the distance between each measurement of the parcel boundaries. The parcel search also includes the names of the family landowner(s). Survey and Mapping Division assigns a unique code to the survey site plan.
SMD further visits the site for inspection when there are mistakes regarding the coordinates of the Surveyed site plan. Upon a complete search, the Client Service and Access Unit is notified to assist the applicant to Legal department for assessment of indenture.

- **Legal Department**

The legal department handles land cases for the Lands Commission. The department is responsible for examining all indenture submitted to the Lands Commission. The indenture is a legal document showing the contract between two parties on a parcel. The legal department examines the indenture by verifying the names of the parties, the purpose of the contract, signature of the parties and solicitor of the Supreme Court of Justice.
The purpose of examining indenture from individual family lands is to avoid fraud of contract to land. Legal Department sign on the indenture indicating the legality of the contract. The legal department submits the indenture to the applicant to be submitted to the Lands Valuation Division.

- **Land Valuation Division**

The Lands Valuation Division values the land by examining the size of the land and the improvements on the land. The input for this process is a survey site plan and an indenture. The Land valuation division gives the applicant the stamp duty fee on a receipt to pay at the Universal Merchant Bank. The fee is calculated as 5% of the assessed value of the land.

- **Universal Merchant Bank**

The applicant submits the receipt to the UMB and makes payment. The UMB examines the receipt by looking at the name of the applicant, value of the stamp duty and the type of land right. The applicant receives a receipt and forwards it to the land title registry.

- **Land Title Registry**

The Land Title Registry provides title to family, public and vested lands. The land title registry receives a request from an applicant to plot the land. The input of this process includes the assessment of survey site plan, indenture, stamp duty receipts. Upon complete verification of these documents, the Land title registry opens a file indicating the names of the party (s), the type of land registration, and date. The land title registry submits a plotting request to the Survey Division for plotting.
The plotting process involves digitizing the survey site plan on the cadastre map of Accra. The cartography department of the survey division does plotting. The cartography department notifies the Survey Division upon complete plotting. The director of survey signs and prepares a report to the legal department to verify whether the plotted land is in the name(s) of the right holder (family). The plotted site plan is to return to the Land Title Registry for archiving.

- **Administration Unit**

The chairperson of Lands Commission assesses the report from the land title registry and prepares the certificate. The certificate is sent to the Land Title Registry for archiving. The Land Title Registry notifies the Customer Service and Client Access Unit to pick the certificate. The applicant picks the certificate from the Client Service and Access Unit.

4.4.1. Analysis and Bottlenecks of family land registration processes

- Duplication of task between the Customer Service and Access Unit and Legal Department in the assessment of site plans and indenture. *(see bottleneck 1)*. The purpose of the Verification and assessment of site plans and indenture is to determine the legitimize family landowner(s) by the Legal Department. However, the verification and assessment of the indenture at the initial stage can be done by the Customer Service and Access Unit. This can be done by keeping records of all names of the family (s) to avoid double verification hence, slowing the process.

- The Client Service and Access Units' task of verifying assessed stamp duty make the process redundant. *(see bottleneck 2)*. The valued stamp duty must directly be forwarded to the Universal Merchant Bank for stamp receipt assessment and payment. The Client Service and Access Unit verifies the receipts to ensure that all documents are in place to ensure payment.

  It can be analysed that the manual format of providing receipts to client opens the way for duplication of functions since the Client Service and Access Unit wants consistency in document verification.

- Duplication of archiving of stamp duty and certificate by the Land Title Registry *(see bottleneck 3)*. Archiving of plotted survey site plans and certificates is purposely to keep track of records of clients in the registration process. Figure 9 above shows that stamp duty is recorded and achieved after payment from the bank. Receipts are recorded after payment; therefore, it is not necessary for the Lands Title registry to record and archive receipts again.

  However, all receipts of land certificates and stamp duty receipts can be archived at the end of the processes.
- Wrongly signing of the survey and plotted site plans by the Legal Department instead of the Survey and Mapping Division. *(see bottleneck 4)*. From figure 9, it can be observed that the Legal Department verifies, and sign surveyed and plotted site plans. The purpose of the task is ensuring legality, consistency, and avoidance of double sale of family lands.

  This has significant implications of creating redundancy in the performance of functions. Ideally, Surveyed Site plans can be verified, and signed together by the director of the survey before sending a request to the Land Title Registry for archiving and certification.

  From the above, it can be realised that the stool and family land registration processes have the most prolonged registration process. The purpose of the processes is to ensure that stools and family lands are devoid of disputes, litigations, conflicts, and multiple sales of lands.

  However, from the figure 8 and 9, it can be recognized that some divisional roles are performed twice. These create the opportunity for officials to extract money from clients. A client indicated that "*when you submit your documents, some officials tell you to pay thousand Ghana Cedis instead of hundred Ghana Cedis so that they speed your process for you*". It was observed that some staff decide to provide the outstanding service to the rich as such skips some of the unnecessary steps created by themselves.

4.5. Public Land Registration Processes

Public lands are sold and registered directly by the Lands Commission of Accra. The institutions involved in the registration processes include; Public and Vested Land Management Division, Customer Service and Access Unit, Town and Country Planning Department, Land Title Registry, Survey and Mapping Division and the Land Valuation division. The public land registration process is the shortest process because lands public lands are sold and managed by the Lands commission of Accra. The figure below shows the registration processes.

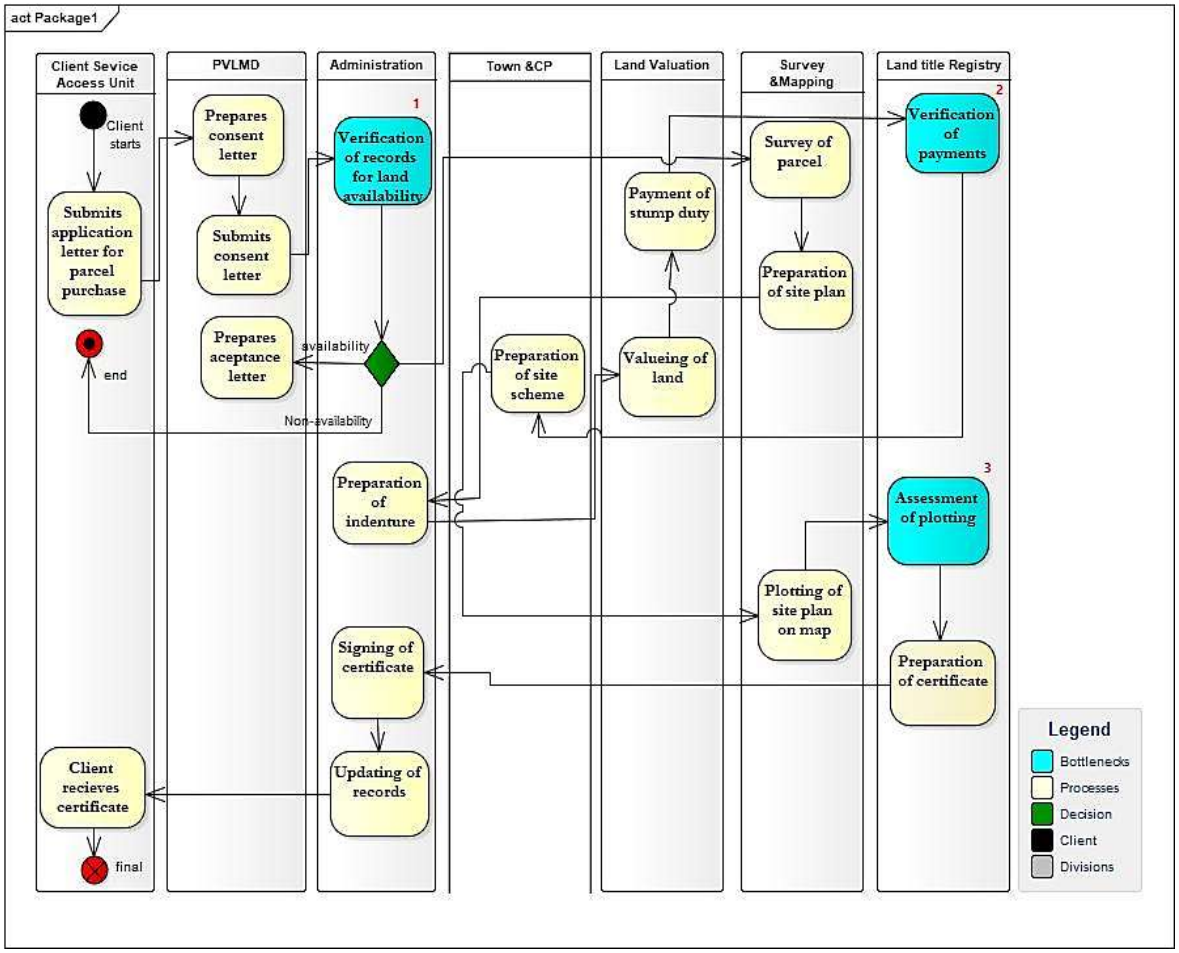

Figure 10 Public Lands Registration processes

- **Client**

Clients purchase public lands at the Lands Commission. At the Lands Commission, the PVMD sells the land and sends the CSAU a notification of a completed transaction to facilitate the registration process. Clients do not struggle much because the Lands Commission does all site plans and the indenture. Hence, it makes the process easier.

- **Public and Vested Land Management Division**

An applicant applies to the Public and Vested Land Management Division to purchase a parcel of lands. The Public and Vested Land Management Division examines the letter and submits a request (consent) to the Records Department to determine whether there is available land for sale.

- **Administration Unit**

The Records Department of the Administration receives a land purchase request from the Public and Vested Land Management Division and file it. The Records Department checks through its maps to determine the available lands in Accra for sale. The Records Department notifies the Public and Vested Land Management

Division upon complete verification. Upon land availability, the applicant is made to make payment at the Universal Merchant bank.

- **Client Service and Access Unit**

The Client Service and Access Unit receives a receipt and a consent letter indicating the payment and acceptance of land transfer. The Client Service and Access Unit notifies the Survey Division to survey the land.

- **Survey and Mapping Division**

The Survey and Mapping Division receives a request from the Client Service and Access Unit indicating the survey of the public land. Survey and Mapping Division surveys the parcel and submits a survey site plan to the legal department to prepare indenture, indicating the agreement between the state and the party. The legal department signs on behalf of the state showing the transfer of right. The legal department notifies the Survey Division upon complete transfer of right. The applicant sends the site plan and indenture to the Town and Country Planning Department for search.

- **Town and Country Planning Department**

The Town and Country Planning Department receives a request from the applicant to determine the land use of the applicant's parcel. Town and Country Planning Department makes a field search and writes a report afterward. Town and Country Planning Department prepares a planning scheme by overlaying the survey site plan on the local planning scheme of the parcel location. The Town and Country Planning Department prepares a technical report to be submitted by the applicant at the Client Service and Access Unit.

- **Lands Valuation Division**

The Lands Valuation Division inspects the survey site plan, indenture, receipts of payment. Land Valuation Division further conducts a field visit and prepares the field report. Land Valuation Division values the land and assigns a stamp duty fee to the applicant. The applicant pays the stamp duty at the Universal Merchant Bank and then submit the receipts to the Client Service and Access Unit. The Client Service and Access Unit submits the documents to the Lands title registry for recording.

- **Land Title Registry**

Land Title Registry verifies the request from Client Service and Access Unit showing the plotting of an applicant's parcel. A file is opened, and a request sent to the Cartography Department of the Survey Division to plot the parcel on the cadastre plan. The director of survey signs the plotted survey site plan. Plotted sitemaps are submitted to the Land Title Registry to prepare the certificate. The certificate is sent to Administration Unit for the chairperson of Lands Commission to sign. The certificate is sent to the Client Service and Access Unit for the applicant to pick it up.

4.5.1. Analysis and bottlenecks of the public lands registration process

- Wrongly defined Verification role of parcel availability by the Administration unit instead of the Survey and Mapping Division. *(see bottleneck 1)*. The purpose is to verify if there is available land for sale. However, the administration cannot give any spatial evidence to the availability of land but by records of parties that have engaged in land transactions in similar locations. Survey and Mapping Division can be given this task because they would be able to verify in their records the details of an already registered state parcel**.**

- Assessment of plotted site plans before certification by the Land Title Registry delays the process instead of verifying and preparing the certificates because assessment has been done by Survey and Mapping Division *(see bottleneck 2)*. The cartography department of Survey and Mapping Division sends plotted site plan to the Land Title Registry purposely for verification and certification. By law, the Survey and Mapping Division is responsible for assessing all cadastre plans. Therefore, there is the need to redefine the roles of the Land Title Registry and Survey and Mapping Division regarding plotting and certification stage of the process.

- Redundant Verification of stamp payment by the Land Title Registry *(see bottleneck 3)*. This affects the process especially when a client forgets to send his/her stamp receipts at that step, the registration delays. Stamped receipts can be sent directly to the TCPD to enable them to conduct scheme assessment for clients.

4.6. Causes of Land Registration Delays from Client/Stakeholders Perspective

From the above processes, it can be realised that most bottlenecks are due to the duplication of functions, wrongly defined roles by each division. On the client's perspective, out of 150 respondents on the causes of the delay in the registration processes, 52 respondents attributed to the poor coordination of functions, 47 bureaucracies, 22 inadequate land registration logistics, 19 Lack of staff, and ten indicated corruption respectively. Interviews from the staff perspective support the above causes but decline the idea of corruption. Stakeholders in the registration processes create processes for themselves because there is no supervision just to make money. From the researcher's observation, it was realised that some of the staff are not willing to change the current system. This gives a clear sign of client's idea of the causes in figure 11 below.

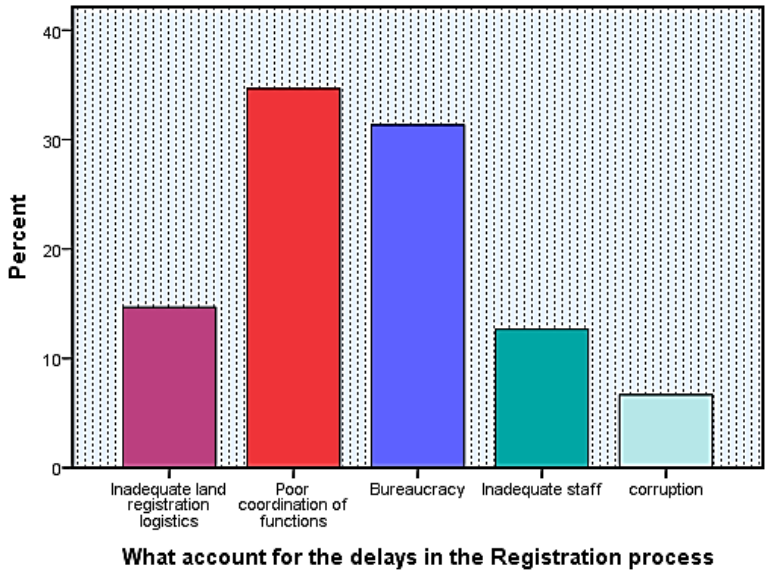

Figure 11 Causes of delay in the registration process

From the figure above, it can be apprehended that poor coordination of function is the leading cause of delay in the registration process which leads to bureaucracy and corruption overall. Variety of expressions from the Customary Land Secretariat and the Town and Country Planning Department show that there is a blur linkage between them and the Lands Commission about a survey of parcels. Customary Land Secretariat employs private surveyor which some are unprofessional(quack), hence creates lousy site plans. There are no proper communication means where Customary Land Secretariat communicates survey site plans to the Survey and Mapping Division. Therefore, each division does what they think is right. It is also not clear as to which institution handles the preparation of site plan. Because the Survey and Mapping Division, Town and Country Planning Department and private surveyor prepare site plans. This gives a signal of the possibilities of map irregularities, improper position of GPS coordinates after field inspection on a site plan.

4.7. Effect of the causes on the registration time span

On the client's perspective, the expectations of the Land Administration Project (LAP) was aimed to reduce the land registration period to three months. However, Clients showed that the expectations of LAP do not reflect the ground truth. It was revealed that most registration period takes more than six months. Clients who refuse to follow-up their documents and pay some token takes more than years to complete their registration. This is due to the cause emanated from the bottlenecks above. Figure 12 shows the period for the registration.

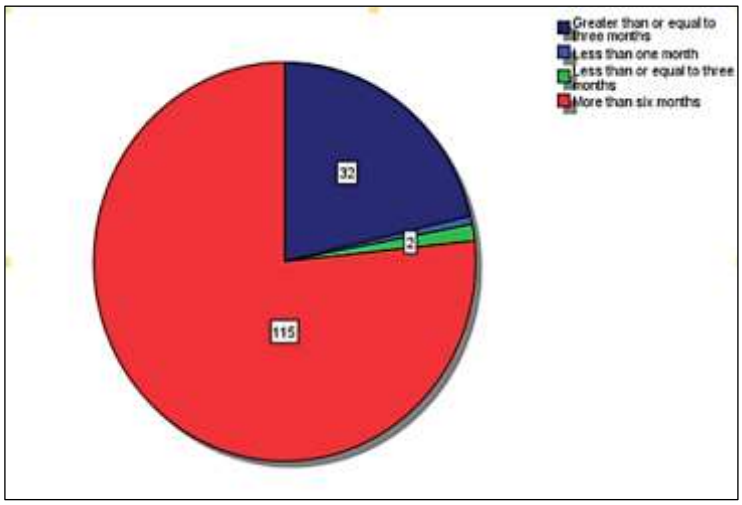

Figure 12 Time span for land registration

4.8. Summary of reviewed findings

The results discussed above give essential insight into the land registration processes in Accra. The process showed that most institutions perform the same functions irrespective of the registration type. We can infer that there is one registration channel with few differences depending on the registration type. The land registration processes have challenges regarding wrongly defined institutional roles and redundant task. The existence of the three types of land ownership systems and the different land rights recognized in the registration processes are the paramount causes of these bottlenecks. This is because most land ownership rests in the hands of some social groups most especially families and stools in Accra.
Together, it was realised that allodial right to land is no more registered in Accra, hence pressure on freehold land right holding. The 58% of leasehold land right registered in Accra gives a sign of a future change from freehold land right to leasehold, sublease, and assignment which has an indication of an increase in pressure at the registration point because most lands need to be leased, assigned, and sublet from freehold interest.

It was interesting to understand that recordation of land right by the Customary Land Secretariat in Accra does not guarantee clients the legal right in any financial transactions at the bank until the official processes start at the Lands Commission.
The land registration process has shown that the stool and family land registration processes are complicated and time-consuming because of the nested land ownership system and the thorough assessment of "who owns what" by the Customary Lands Secretariat and the Lands Commission delays the processes. For instance, the proliferation of families which currently stands at 178 is due to the increase in the population of families in Accra and increase of economic activities.

Contrary to expectations of public land registration in other parts of the world, the review has shown that public lands registered by Lands Commission has few processes but has some challenges such as the duplication of functions. This can be attributed to the fact that most registered lands are family and stool lands as such where there are public lands in the process, the same "delay culture" is applied to public land registration processes. This calls for the engagement of clients and the staff about their concerns and new ways that would reduce the bottlenecks to ensure an improved land registration process

4.9. User requirements

Users are clients (formal and informal sector workers, estate companies) and staff involved in the land registration processes. According to Wang, Yu, and Xu (2017), user requirements are a relevant component of information to develop or improve existing system design. This implies that Land registration should be built to meet the needs and benefits of the people concerning their relationship to the land. To ensure that, Clients of the Lands Commission were interviewed to share their concerns on how the Land registration system should work. The requirements of the clients and staff were collected using questionnaires and interview guide respectively. Results of the client's and staff requirement are discussed below.

4.9.1. Client requirement

Client(s) of the current land registration system include public sector and private sector workers such as banks, estate companies, firms, and institutions. The informal sector workers in the registration process include traders. Collection of client requirement helps to get different views from the client(s) on the land registration process and how their responses would change the present situation.

- Clients showed that their documents are not scanned at the entry point of the registration, i.e. at the Customer Service and Access Unit. Therefore, they carry most documents from office to the office which leads to missing files. From the CSAU point of view, all documents are scanned at the last stage of the processes to get records of applicants. This sometimes leads to missing files especially when the number of the applicant are many. The CSAU suggested that it would be easy when applicant's documents are scanned at the entry point to allow digital movement of files.
  On the contrary, few clients denied the fact that, the scanning would not help because they have the feeling that their documents can be edited and transfer their right to another party (s). This gives a general idea that Clients require the land registration process in a digital format to avoid missing and damaged documents.

- Clients showed that traveling a long distance to the Lands Commission is still something that needs to be addressed. Client suggests that the processes should be decentralised and reduced to improve the land registration process in Accra. This is because the Lands Commission in Accra serves the large neighborhood in Accra. Some officials indicated that, if the Metropolitan, Municipal and District Assemblies (MMDAs) are given the right to register lands at the local level just as the existence of Town and Country Planning Offices in the MMDAs in Accra.
  Clients indicated the need to decentralise the processes at the Municipal and District level so that the regional Lands Commission would have a seamless database to share data. This implies the need to decentralise and interoperate data within local government land offices. The figure below shows the suggestion for improvement.

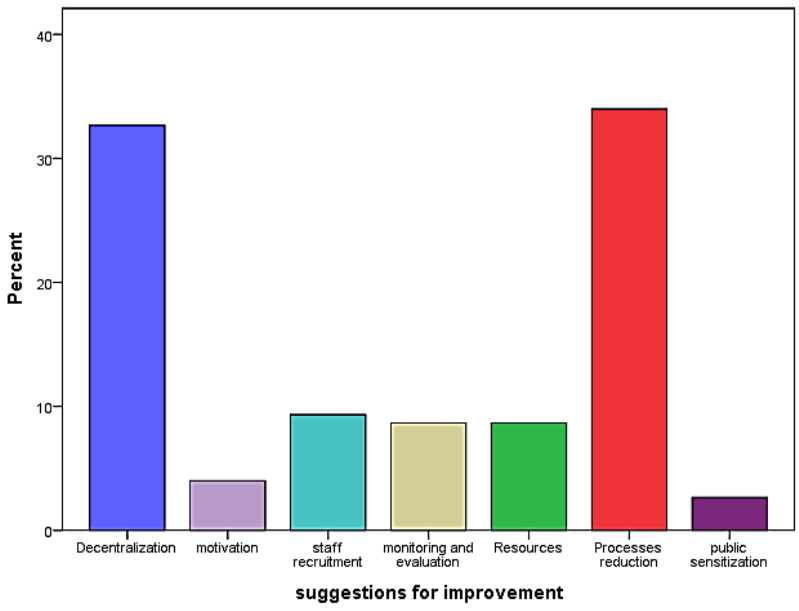

Figure 13 Land registration process suggestions

- Moreover, Clients specified that sending of a text message to them delays information sharing because sometimes network failure does not send messages on time. Text messages which are sent out to applicants are not the best regarding content and timing. Clients complain of receiving several text messages in respect of documents they know nothing about. These messages are sent to them many times in a day. Some criticised for receiving more than 20 messages in a day.
  However, clients suggested the use of phone calls, emails, or post. This is necessary because it would reduce the stress client go through since some of the offices within the Lands Commission are not close

to each other. Therefore, application forms should make provision for other mobile contacts so that clients can be reached on time.

- Survey site plans are necessary to be checked at the Lands Commission but going to the field for site inspection was suggested by clients to be removed. Therefore, there should be a desktop system for verifying and inspecting land documents. Considering this requirement, valuation and ground rent assessment can be facilitated quickly at the office.
- Clients indicated that the plotting and signing stage of certification takes more time. According to clients, it sometimes takes more than a month when the documents get there. However, it was discovered that there is no interface available to all the divisions to keep track of each other. Information shows that, certification stage of the land registration process is done at the end of every three months as such clients indicated that there should be a system in the workflow where a privilege can be given to an officer to monitor and check the processes of registration at each stage to avoid each division from keeping files.

4.9.2. **System requirement**

These are system specifications that would enable the new system to perform adequately. These requirements ensure efficiency, flexibility, interoperability, integrity and testing of the new system (Oshana, 2015). These requirements include the below:

- Interview with the Survey and Mapping Division indicates that there is the need to reduce the double search of the parcel on site. There should be an interface where all private surveyors would directly upload coordinates picked from the site to the commission to enable surveyors at the commission directly prepare site plan on a uniform template.

- The use and access to the internal and external database should be the starting point within each division of the Lands Commission to enable them to track documents of applicants. The interview shows that officers need a database to store both spatial, non-spatial survey plans and historical files. This should support multi-user database between Lands Commission and stakeholders.
- There exists no official workflow that monitors and evaluate actors within each division. The Lands Commission indicated the need for well assembled and networked computers, well customized and functional intranet and internet system that can ensure faster execution of data on the interface of the system within the divisions and its stakeholders to ensure monitoring and evaluation.

- Provision should be made for the number of required copies (extra copies) of documents presented by the client for easy identification. The interface indicating the forms of every division should be created for the number of copies. Clients are required to submit indenture and site plan as the essential required documents, yet officers of the division are given one or two depending on the type of registration. For example, the system interface template should include all relevant information and documents needed for statutory, family and stool lands registration.
- The verification of documents interface does not permit the CSAU attendant to absorb and write reports on the status of a client's application. The CSAU verification process does not track the progress of a client's application. However, it supports the search of documents. Results show that the CSAU receives about averagely 200 applications per day regarding first registration and other registration inquiries which takes about a day to review all these applications when an applicant's documents meet all requirements. This slows the preparation of reports on all enquires made by these applicants.

- Technically, interviews show that the workflow model should be able to support the survey maps and other attribute data, communication within other connected programs and provide the level of access permission of officers within each division of the Lands Commission such as an ID or a password.
- To ensure quick access to registration information, it was suggested that there should be an online system where clients can upload and find information regarding the registration processes. These according to some staff, would reduce clients from making mistakes regarding what should

4.10. Summary of user requirement

The purpose of user requirement in the research is to link customer and staff needs with the identified bottlenecks in the registration process and draw technical implementation mechanism to improve the process. It was observed from the requirements that, most of the needs of the people can be analysed based on; digitalisation, decentralisation, reducing of processes and security of document (scanning, database).
Technically, it was realised that some users require that the system should absorb spatial data that would limit the processes of the filed visit. However, the boundary of stools and families are difficult to determine because planning schemes do not show the exact boundary of people.

Findings show that the nature of the tenurial arrangement of land in Accra creates disputes and conflicts as such clients suggest the need for security of documents. One unanticipated finding was that some clients do not prefer the scanning of their documents. This is because clients have the perception that their documents are not secured because it can be edited by an official to another party. This implies that it is necessary to consider the security of clients' documents during the registration process. This means user and system requirements would be integrated into the design and implementation of a new workflow model in chapter.

5. LAND REGISTRATION WORKFLOW RE-DESIGN AND IMPLEMENTATION

5.1. Introduction

This chapter focuses on the re-design and implementation of a new land registration workflow model aimed at ensuring efficient and transparent land registration system. The re-modeled land registration process shows the integration of the three-land registration process in figure 8,9,10 into two processes. The integration is essential because the actors involved in these processes have similar functions. Main elements of the model implementation include the application of process maker software and Postgres database. The model implementation is characterised by the ability:

- To facilitate electronic data, storage, and access to digital documents between the Lands Commission and the stakeholders.
- Secure and record land information such as use, ownership security of title, valuation, and ground rent details.
- Ensure timely access to land documents.
- Facilitate Land administration best practices such as archiving and certification of land right.
- Monitor and access land information in the registration process

This chapter constitutes four (4) sections and subsections. Section 5.2 of the chapter analyses the rationale to re-designing a new land registration workflow model. Each rationale is aimed to enhance validation of the land registration workflow model through the comparison of user and system requirements in section 5.3. Based on the validation, the further chapter re-designs the new land registration workflow model in section 5.4. Section 5.5 finally, presents the implementation processes of the re-designed land registration workflow model.

5.2. Rationale for change in the Land registration system

The land registration process of the three types of land ownership are registered by the same divisions of the Lands Commission and its stakeholders with similar responsibilities. This makes it possible for responsibilities that are redundant, wrongly defined and duplicated to be removed without any effect. The rationale is purposely influenced by:

- Service quality. Client focus is lost regarding quick information delivery on client's application status by the Client Service and Access Unit. Therefore, client's follow-up of their transactions may affect the process. i.e. waiting time and task delivery time. Data responsiveness and reliability among the divisions of the Lands Commission and its stakeholders are not effective because of lack of quality management. Hence, the re-designed model has the potential to make the process more efficient through an automated re-designed workflow with client support element to ensure information delivery.

- Risk of data error. The multiplicity of survey functions among the Survey and Mapping Division, Customary Lands Secretariat, Town, and Country Planning Department regarding the preparation of site plans result in errors on site plans since there is no unique template where all site plans are drawn. The new model re-enforces the role of the legitimate division responsible for preparing site plans.

- Improve capacity. There is a weak relationship between the Lands Commission and its stakeholders regarding data sharing because they work at separate places. Exchange of documents among themselves takes time. Therefore, the re-designed model requires facilitating teamwork, co-operation and understanding of each other's roles and responsibilities which will prevent delay and loss of documents. Details of the rationale for the change is shown in table 6. below based on the bottlenecks in the three types of land registration. These will be validated in the new land registration processes in section 5.3.

Table 6 Rational for change in the registration process

Process	Task	Bottleneck	Rationale for change
Stool (see figure 8)	Stamp payment verification	Wrong definition of stamp verification role. Client Service and Access Units' task of verifying assessed stamp duty makes the process redundant because the Survey and Mapping Division by principle must verify stamp receipts.	These steps can be removed without any effect. Because stamp duty receipts can be directly verified by the Survey and Mapping Division. This will involve checking the authenticity of submitted stamp receipts of the client before performing its task.
	Verification and payment of ground rent	Wrongly verification and receival of ground rent by PVLMD	Breach of Land Bill 2016 by the PVLMD to create bank account where all rents are verified and paid. This will ensure accountability and transparency in ground rent sharing among various stool owners.
	Field survey visit and site inspection	Double parcel site visit and inspection by Town and Country Planning and Survey and Mapping Division instead of one.	Survey and Mapping Division is responsible for verifying the client's field when there are irregularities in parcel search. TCPD only visits the site when the applicant applies for building permit.
	Verification of site report	Wrongly verification of local scheme report by the Administration unit of Lands Commission instead of directly from TCPD to Survey and Mapping Division for plotting.	The direct transfer of site plans from the TCPD to the SMD will facilitate the process because the SMD can authenticate assessed site plans since the TCPD and SMD have similar functions and skills.
Family (See figure 9)	Verification and assessment of site plan and indenture	Duplicated task between the Customer Service and Access Unit and Legal Department in the assessment of site plans and indenture.	CSAU is by principle responsible for assessing all site plans and indenture sent because it serves as the front office where all site plans and indenture are verified before the processes start. A legal expect needs to be at the CSAU to check first applicants document to avoid the processes going back to the legal department to waste time.
	Verification of stamp value	Redundant Verification of stamp value by the CSAU instead of the UMB bank	This task is unnecessary since the bank will equally have to verify the valued stamp before effecting stamp payment to improve service quality.
	Recordation, archiving and certification	The duplicate task of archiving stamp duty and certificate by the Land Title Registry instead of doing them at a time.	Reports and required documents from each division can be saved independently, but all receipts and certificates can be archived at the end of the process.
	Signing of plotted site plans	Wrongly defined signing role of surveyed and plotted site plans by the Legal Department instead of the Survey and Mapping Division	The director of Survey and Mapping signs all site plans and not the legal department. Therefore, the SMD needs an improved capacity to the authentic plotted family site plan to avoid future court issues.
Public	Verification of records for	Wrongly defined role of Verification of parcel availability by	The Survey and Mapping handle all spatial issues of the Lands Commission as such the search for public land availability can be

Process	Task	Bottleneck	Rationale for change
(See figure 10)	land availability	the Administration Unit instead of the Survey and Mapping Division.	decided by the SMD but not through the records of the Administration Unit of the Lands Commission who have only book records of available list of parcel locations and sizes.
	Verification of stamp payment	Redundant Verification of stamp payment by the Land Title Registry.	The TCPD can verify the stamp payment before conducting land use assessment instead of the LTR verifying from the LVD before it is sent to TCPD
	Assessment of plotted map	Assessment of plotted site plans before certification by the Land Title Registry delays the process instead of verifying and preparing the certificates.	Certified plotted site plans from the SMD can aid the preparation of certificate by the Land Title registry instead of re-assessing the plotted site plans before.

5.3. Validation of the New Land registration System (VLS)

Validation of workflow model requires the identification of a gap in an existing system, and the requirements for its constituent activities (Sadiq, Orlowska, Sadiq, & Foulger, 2004). Based on the rationale for the change in table 6, this section validates the land registration workflow model. Validating the model is essential because client's specification can be compared against re-design specification, it reduces the risk of error, and manifest the land registration bottleneck defects during the re-design process. User and system requirements are needed in this process to support full implementation of the validated processes in a new system. The table below shows validation of the new system.

Table 7 Validation of the new land registration process

Process	Validated registration process	Actor (s) involved	User requirements	Design requirements	Comments (*improved comments in figure 14)*
Stool	Stamp payment verification	Survey and Mapping Division	Electronic transfer of assessed stamp value.	Digital stamp value receipts.	**Validated.** The Survey and Mapping Division will conduct stool parcel search after verification of stamp payment.
	Verification and payment of ground rent	Bank	– Electronic transfer of assessed ground rent – Publicity of Valuation and ground rent assessment criteria.	– Computer base system for ground rent assessment. – Digital form is showing ground rent payment details.	**Validated**. The bank will verify and effect payment of all fees (stamp duty and ground rent) before it is sent to the TCPD for land use assessment.
	Field survey visit and site inspection	Town and Country Planning Department	All assessment and inspection need to be done on the computer using updated aerial images of Accra.	Map panel is showing the visualisation of maps.	**Validated.** Land use assessment will involve direct verification of Clients parcel on a local printed scheme before it's forwarded to the SMD for plotting.

Process	Validated registration process	Actor (s) involved	User requirements	Design requirements	Comments (*improved comments in figure 14*)
	Verification of site report	Survey and Mapping Division	Electronic verification of reports.	System absorption and preparation of notified reports and request	**Validated.** Survey and Mapping Division will verify the assess land use reports from the TCPD before the preparation of plotted site plans.
Family	Verification and assessment of site plan and indenture	Customer Service and Access Unit	– The use of one assessment system showing the details of the client. – Reduce the number of times a client visits the registration center.	– Standardization of forms to support absorption of client's details. – Detail of registration forms should cater for other client's contacts.	**Validated.** The CSAU will solely verify all documents before it moves to the Lands Valuation Division for stamp duty assessment.
	Verification of stamp value	Bank	Electronic transfer and verification of stamp value.	Digital receipts are showing the detail of stamp value.	**Validated.** All valued parcel will be verified before payment.
	Recordation, archiving and certification	Land Title Registry. Administration Unit	Archiving systems must be put in place to record and save files to avoid missing files.	– Database support element to record and save plotted land documents and client's certificates. – Scanning of client's documents.	**Validated.** Archiving of stamp payment and certificate will be the final stage of the process.
	Signing of plotted site plans	Survey and Mapping Division	All plotted site plans must be given a unique ID to enable track of client's details.	System operationalisation on parcel boundaries to visualise coordinates and detail of clients.	**Validated.** Plotted site plans will be prepared and signed by the SMD before certification by the Land Title Registry.
Public	Verification of records for land availability	Survey and Mapping Division	Printed local scheme availability and advanced form of parcel availability.	Use of sophisticated software such as ArcGIS and Map plotter to design accurate site plans.	**Validated.** Survey and Mapping Division will be responsible for attesting the availability of public land for sale and registration.
	Verification of stamp payment	Town and Country Planning Department	Electronic transfer and verification of stamp value.	Digital receipts are showing the detail of stamp value.	**Validated.** Stamp payment needs to be verified by the TCPD before land use assessment.
	Assessment of plotted map	Land Title Registry	Use of aerial or orthophotos for map plotting.	System ability to support aerial images and orthophotos for quick map plotting.	**Validated**. The Land Title Registry will directly prepare certificate from plotted site plan from the Survey and Mapping Division.

5.4. Re-designed Land registration workflow model

The figure below shows the remodelled land registration processes of stool, family, and public land ownership system.

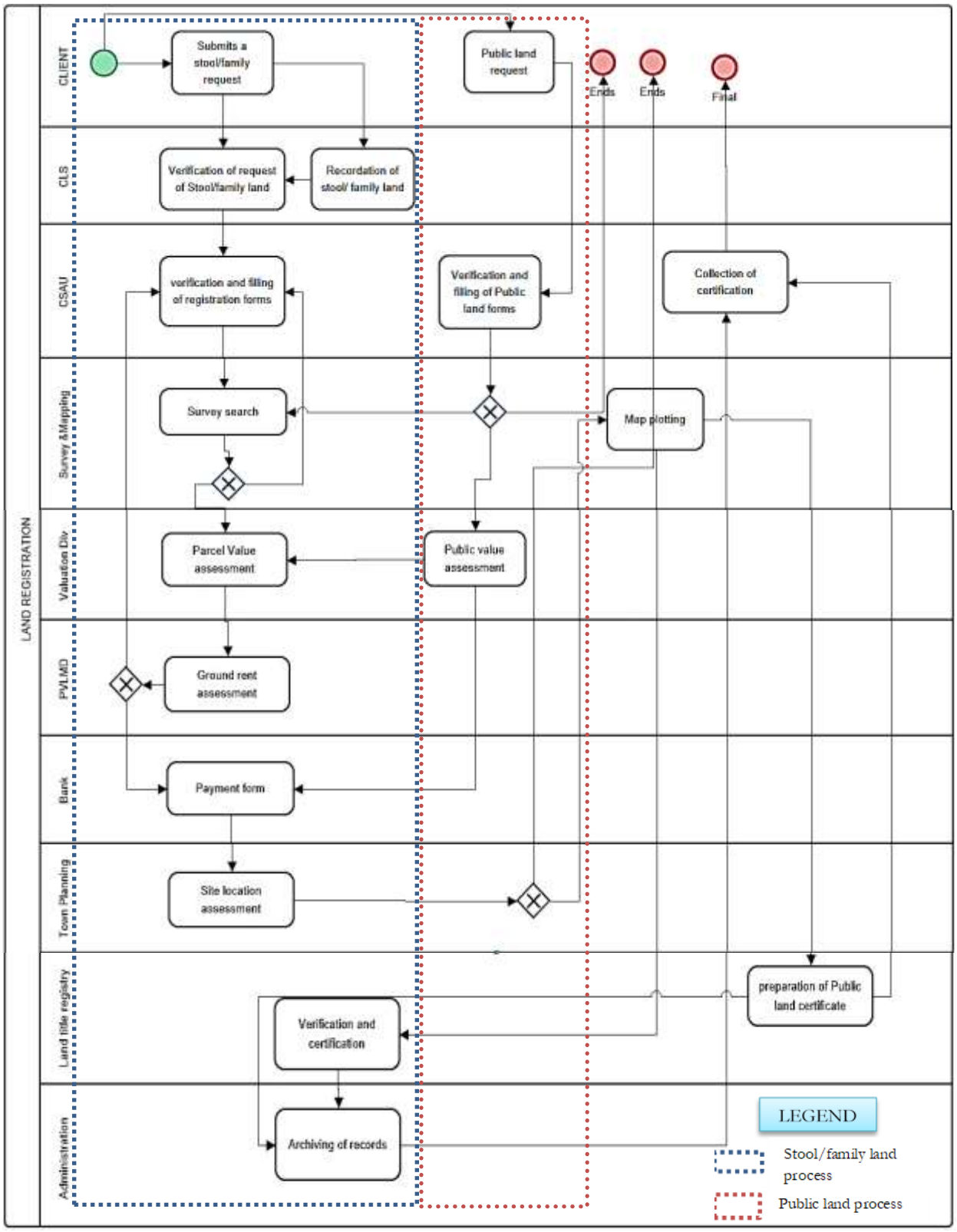

Figure 14 New Land Registration Workflow mode

5.4.1. Description of re-designed stool/family land registration processes

Following figure 14 and table 7, the stool and family land registration processes have been merged into one registration workflow because these processes and actors are similar. The steps below explain stool/family land registration process in figure 14.

Steps

- Client applies to the Customary Lands Secretariat for recordation and assessment of land right. At CLS, the client (s) completes a recordation form showing the name of the applicant, the land right owners, email, and the purpose of recordation (see appendices 11).
- The output of the recorded forms is saved in the database and sent to the Client Service and Assess Unit to verify attached documents (indenture and site plan) and the recordation request forms from CLS. CSAU request for parcel survey search for the client, showing the name of landowners, ownership type and the location of the parcel (see figure 14 and appendices 12).
- Survey and Mapping Division receives a survey search request from the CSAU and verifies the request, i.e. name, site plan and the location of the parcel from the database.
- SMD notifies Lands Valuation and PVLMD to assess stamp duty (valuation) and ground rent upon complete search. Where a different party has registered the searched stool/family land, the SMD sends the search results to form back to CSAU for the applicant to pick. LVD and PVLMD notify the Bank to effect payment of stamp duty and ground rent.
- A notification is sent by the bank to the TCPD to assess land use and prepare site location report to the SMD for map plotting.
- TCPD notifies the CSAU when the parcel land use does not fall within the local scheme of the parcel location.
- SMD notifies the Land Title Registry to prepare certificate upon complete map plotting from the SMD. The certificate is prepared and sent to the Administration Unit to archive it. Notification is sent to the Client to pick the certificate.

5.4.2. Description of re-designed public land registration process

Public land registration starts from the CSAU. Steps below explains the public land registration process in figure 14.

Steps

- Client request for parcel purchase at the CSAU. CSAU request parcel availability at the SMD. Where a client request is met, the SMD surveys and prepares a site plan for the applicant.
- A notification is sent back to CASU when client request fails. SMD notifies the Lands Valuation Division to value the land and prepare stamp duty to be paid at the bank.
- Bank notifies the TCPD to assess land use. SMD studies the report from TCPD and plots the site plan on the map location of the parcel.
- The plotted map is sent to the Land Title Registry to prepare certificate and archived at the Administration Unit.

5.5. Workflow model implementation

The transformation of the manual system of land registration to digital requires the implementation of the new system to examine its efficiency and transparency. This section presents the implementation of the new workflow model in figure 14. The steps of the implementation include:

- Selection of software application
- Data organization
- Task operationalisation
- System output interface
- System output generation
- Rules and conditions
- Database connection and records tracking

5.5.1. Selection of software application

Process Maker software was selected for the design and testing of the new land registration workflow model. The software is a business process design and open source software which can be hosted in the cloud. The

software manages spatial data and supports other software applications. By principle, the software supports a PHP web language that links PostgreSQL database and other databases. For this type of study, the process maker platform was selected because it provides an extensive toolbox that helps to create digital registration forms in different formats that can be viewed, managed on a web interface, and coordinated between users of Lands Commission and its Stakeholders.
The platform can also assist Lands Commission to design, automate, deploy, and communicate between a technical unit of the Lands Commission and its stakeholders more efficiently. Unavailability of the internet can delay the functions of this platform, but it can be converted to a desktop application for easy usage.

5.5.1.1. Alternative software Application

Alternatively, the model can be designed and tested with other software's. Among them include; Business Process Management System(BPMS), SharePoint, Enterprise Architecture, Webcast, and Process Visio. These software's can connect to other applications and work efficiently. However, these software's are expensive and involves lots of computer programming and computer knowledge to ensure its automation.

5.5.2. Data organization

The model's dataset includes an ESRI-map of Accra showing both public and stool/family lands. The dataset is hosted on a local server to enable display of the map in the map panel of the Process Maker Software. The map was attached to the Process Maker interface using the java scripts in figure 15 in an open street map layers *(openlayers.org/en/v4.6.3/css/ol.css, cdn.polyfill.io/v2/polyfill.min.js?),* which enabled to determine the location of Accra on the open street map.

```
1  $('#Location').setValue("Accra Ghana");
2
3  var aoiSource = new ol.source.Vector({wrapX: false});
4  var vector = new ol.layer.Vector({
5    source: aoiSource
6  });
7
8  var familySource = new ol.source.ImageWMS({
9      url: 'http://41.57.108.208:85/geoserver/wms',
10     params: {"LAYERS": 'Kwame:Family'},
11     serverType: 'geoserver',
12     crossOrigin: 'anonymous',
13     wrapX: false
14 });
15 var familyLayer = new ol.layer.Image({
16     source: familySource
17 });
18 var stateSource = new ol.source.ImageWMS({
19     url: 'http://41.57.108.208:85/geoserver/wms',
20     params: {"LAYERS": 'Kwame:State'},
21     serverType: 'geoserver',
22     crossOrigin: 'anonymous'
23 });
24 var stateLayer = new ol.layer.Image({
25     source: stateSource
26 });
27 var map = new ol.Map({
28     target: 'panel00000000001',
29     layers: [
30         new ol.layer.Tile({
31             source: new ol.source.OSM()
```

Figure 15 Map panel script display

5.5.3. Task Operationalisation

The model defines the parcels based on the type of land ownership in Accra (family/stool and state lands). The target of these parcels shows a map panel which enables the parcels to display on the form to assist the Survey and Mapping Division, Town and Country Planning Department and the Land Title Registry to perform a spatial task (draw polygons) upon a type of client's request.
To perform digitizing function on an area of interest of a client request, the javascript written in figure 16 below permits the Survey and Mapping Division to draw polygons and save parcel coordinates. Line 44, 52, 57 and 60 of the script shows the interaction between the open source layer and the area of interest that will help execute the drawing of the polygon by an officer.

```
        vector
    ],
    view: new ol.View({
        center: ol.proj.fromLonLat([0.13980, 5.76690]),
        zoom: 10.5
    })
});


/*var draw;
function addInteraction(){
  draw = new ol.interaction.Draw({
    source: aoiSource,
    type: 'Polygon'
  });
  map.addInteraction(draw);
}
addInteraction();*/
var draw = new ol.interaction.Draw({
  source: aoiSource,
  type: 'Polygon'
});
draw.on('drawstart', function(){aoiSource.clear()});
map.addInteraction(draw);

aoiSource.on('addfeature', function(){
  var coords = $.extend(true, {},aoiSource.getFeatures()[0].getGeometry());
  $('#cordinates').setValue(coords.transform('EPSG:3857','EPSG:4326').getCoordinates());

});

```

Figure 16 Map operationalisation script

5.5.4. **Output interface**

Notification received from a division is opened in a dynoform. The results of executing figure 15 and 16 produce an output interface where tasks are operationalised. Where an officer draws a polygon for parcel survey, the properties of the polygon automatically fills the dynoform (see figure 18). The interfaces are the same for all the divisions with unique dynaforms and password.

From the Survey and Mapping Division interface (figure 17), parcel search request form is operationalised in the map panel container. In the panel, officers can search, draw, and save polygons depending on the request type. Figure 18 shows the detail of the dynoform derived from execution of actions in figure 15 and 16.

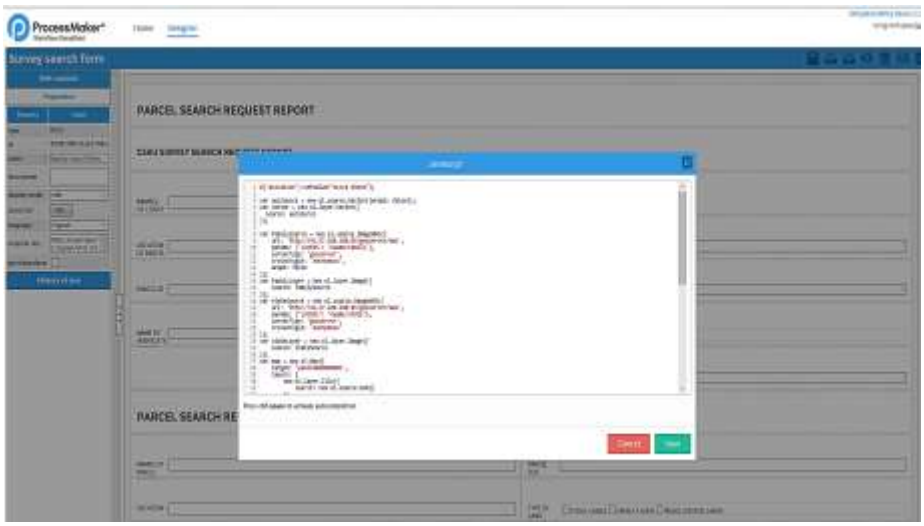

Figure 17 Output interface

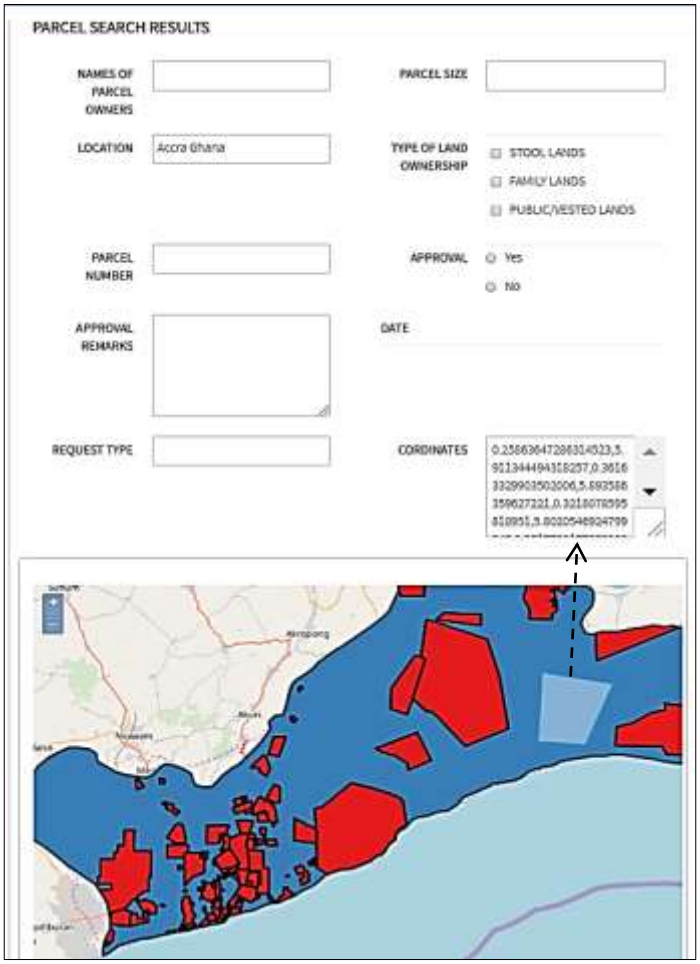

Figure 18 Parcel search generated forms

5.5.5. **Output generation**

The model shows the generation of output document at each stage of execution. When a client submits a request for parcel search at the Customer Service and Access Unit, the details of the client is indicated in an output document. This displays in PDF-like or word document which will enable the Survey and Mapping Division to assess the request form and execute a survey of parcel or search of the surveyed parcel as indicated in figure 19.

The output generated report is operationalised by HTML codes that link the clients request details from the variable picker. E.g. @@First_Name, @@Request_Type etc. At the Land Title Registry, certificates are prepared using the HTML function. The HTML function indicates the structure of the report which includes the alignment of text, paragraphing, font size, a style which enables each officer to write a report and save in a word or PDF format for the next officer to view and act on it.

The HTML executes the format of the dynoform, email templates, and certificate. The output documents are easily archived in the database. Figure 19 and 20 shows the HTML function and the output of an initiated client request in the model.

Figure 19 Report generation script

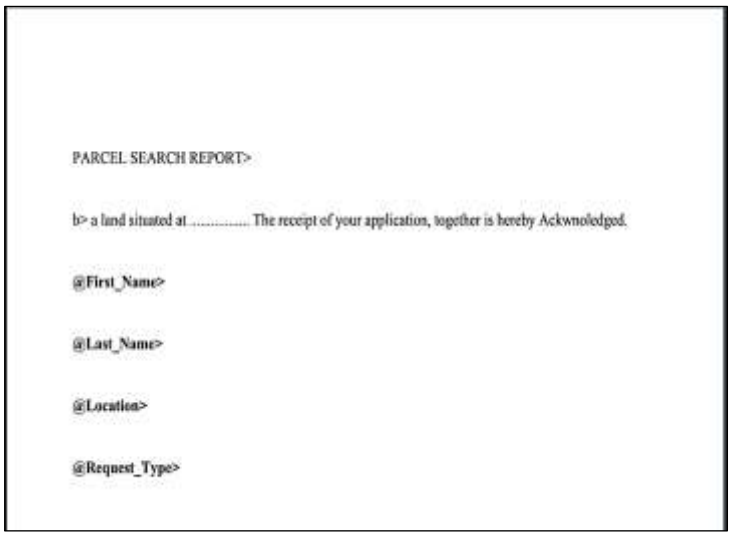

Figure 20 Report generated from script

5.5.6. **Rules and conditions**

The rules and conditions are embedded logic behind the decision-making stage of each step of the processes in figure 14. The conditions are centric, meaning, completed tasks flow upon approval and rejection of request using the "if condition". The model shows steps of the task assigned to each division with attached forms indicating the purpose of the task to the next officer in the registration process. In appendices 16, a rule is assigned to the Customer Service and Access Unit showing the name of the forms, below the Assigned Element.

This implies that the CSAU will be able to send a report to SMD for survey or parcel search. Imperatively, an exclusive gateway condition is executed at the decision point of the Survey and Mapping Division to approve or disapprove the request to conduct a survey or survey search (See appendices 14). This means that, where parcel survey or survey search is approved, the system sends a notification to the Lands Valuation Division for land value assessment. Another exclusive gateway condition is assigned to the swim lane of the Public and Vested Land Management Division and Town and Country Planning Department processes to determine ground rent when it is a stool/family land (See appendices 15).

The purpose of using the exclusive gateway is to evaluate the condition under which the next task is assigned to the flow. A cyclical assignment is assigned to every division to performing a specific task and prevent each division from performing the task of the other. This gives every officer in charge of a task in a division to perform an exclusive action on a task requested by a division in the flow. This will provide security and ensure transparency in data handling among the divisions.

5.5.7. **Database connection and records tracking**

The model is built on a PostgreSQL database. The database shows the records table of the recordation of land right, verification of application document, parcel survey search table, valuation, ground rent, payment, site assessment, map plotting, certification, and archiving table. The table keeps track of records executed by all the actors in the workflow. The Client recordation table displays the client's name, ID, address, email, contacts, type, and purpose of recordation.

This preliminary information is used as a trigger in the client request form. This information is triggered in the database to reduce repetition of client's information whenever a completed task is sent to the next actor in the workflow. See figure 21 and 22 for details.

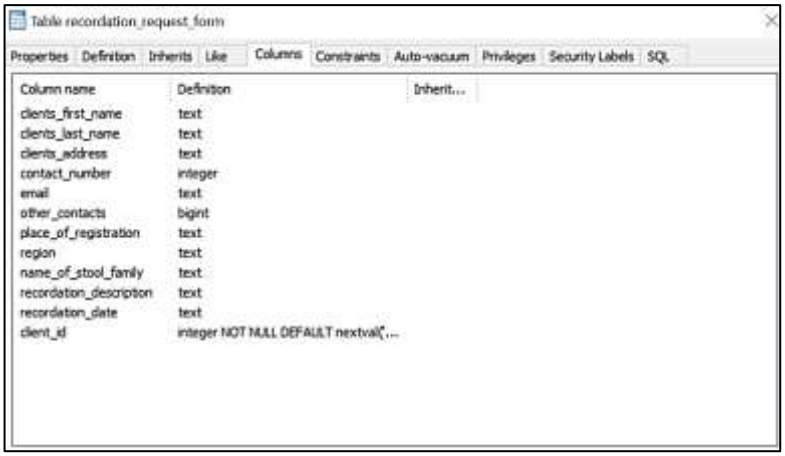

Figure 21 Database connection

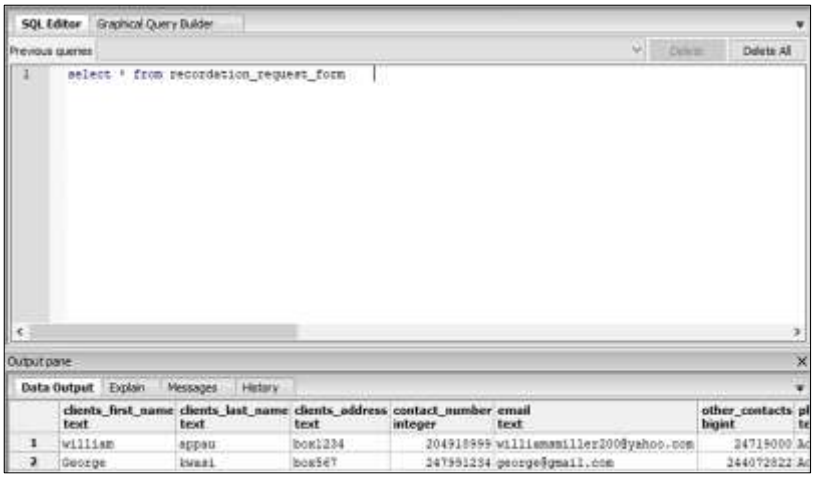

Figure 22 Database records

Figure 21 describes a tested record of an initiated request from clients. In the database, details of the clients are recorded in the client recordation form. When a client submits a request, the database gives a unique Clent_id (primary key) which serves as a unique identification number of the client. This would enable the Customer Service and Access Unit and the Survey and Mapping Division to facilitate parcel search easily. The trigger below shows the codes that permit the database to respond to a request submitted by a client. The scripts ensure that whenever an officer initiates a request, the query "INSERT INTO" saves into the

database field details of the execution. This equally enables the execution of the Query "SELECT *" from each records table in the database. Figure 23 shows the database connection triggers

```
$host = 'gip.itc.utwente.nl';
$port = 5434;
$dname = 'la_exercises';
$user = 's6029922';
$password = '_s6029922_';
$db = pg_connect('host='.$host.' port='.$port.' dbname='.$dname.' user='.$user.' password='.$password);
$client_first_name = @@FirstName;
$clients_last_name = @@LastName;
$clients_address = @@Address;
$contact_number = @@ContactNumber;
$email = @@Email;
$other_contacts = @@OtherContacts;
$place_of_registration = @@PlaceOfRegistration;
$region = @@Region;
$stool_name = @@NamesofStoolFamilyLandOwners;
$recordation_description = @@RECORDATIONDESCRIPTION;
$recordation_date = @@Date;

$query = "INSERT INTO recordation_request_form(clients_first_name, clients_last_name, clients_address, contact_number,
email, other_contacts, place_of_registration, region, name_of_stool_family, recordation_description, recordation_Date)".
"VALUES ('$client_first_name', '$clients_last_name', '$clients_address', '$contact_number', '$email', '$other_contacts',
'$place_of_registration', '$region','$stool_name', '$recordation_description', '$recordation_date')";
$result = pg_query($db, $query);
if($result){
    echo 'Inserted!';
}else{
    echo 'There was error';
}

$result = executeQuery($query, $db);
```

Figure 23 Database Connection and Trigger

5.6. Summary of Chapter

The rationale for the change of the land registration workflow model has proven the need to validate and design a new land registration workflow model by integrating the land registration processes into a single window where all client details can be checked and executed. From figure 14 above, it can be realised that there are still more actors involved in the process. However, some illegitimate task that was previously performed has been removed based on the rationale for change in section 5.2.

Therefore, it is presumed that re-modeled land registration processes will ensure timely access to digital data and records keeping. In the new workflow model, the Clients Service and Access Unit is permitted to verify all required documents of a client before application starts. The flow of data, generation and absorption of reports, database connection and retrieval of records are the most essential requirements achieved by this model. The use of triggers and Javascript language are found to be the essential elements that enable the automation of the model.

6. DISCUSSIONS

6.1. Introduction

In the previous chapter, we analysed and summarised the results of the land registration processes, user requirements and re-designed land registration workflow processes. This chapter discusses the findings through the linkage of the existing knowledge of study. The discussions are focused on the research sub-objectives.

6.2. Discussion of objectives

The discussion below explains the results vis-a-vis concepts from literature to remodel land registration processes in complex land tenure environment. This constitutes the research questions aimed to achieve each objective of this research.

6.2.1. Objective one: Review of the existing Land Registration Systems.

- Bottlenecks in the registration process

Several studies have noted that the presence of nested land tenure system creates the enabling environment for the complexity of land registration. The present study has shown that the existence of the three types of land ownership systems and the different land rights recognized in the registration processes are the paramount causes of these bottlenecks, i.e. task redundancy, duplication of functions and wrongly definition of roles of the registration process. This is because most land ownership rests in the hands of some social groups most especially families and stools in Accra. This affirms Christopher Udry (1993), and Payne, Mitchell, Kozumbo, English, & Baldwin (2015) that, where there exist multiple tenure system, land registration is characterised by complexity and negotiability of parcel sale by social groupings which creates problems at the registration point.

- Recognized land right in the registration process

A study by Bottazzi and Rist (2012), Kleemann et al. (2017) shows that Land ownership systems are not mutable but are subject to a continuous process of transformation of land rights. This study corroborates earlier findings that allodial right to land is no more registered in Accra. Hence pressure on freehold land right holdings transforms to leasehold, assignment, and sublease. The 58% of leasehold land right registered in Accra indicates a future change from freehold land right to leasehold, sublease, and assignment.
A theoretical review of land registration processes shows that constant recordation of land right brings people to the first step of the property ladder (Verstappen, Zhao, & Zevenbergen, 2011). This is supported by research. However, recordation of land right by the Customary Land Secretariat in Accra does not guarantee clients the legal right to embark on any monetary transaction until the process goes through the Lands Commission. This raises the possibility that, clients who engage in transactions with individual family landowners may not waste their time to record their land right at the Customary Lands Secretariat but would directly proceed to the Lands Commission for registration.

- Land registration processes

Prior studies have shown that stool and family land registration processes are complicated and time-consuming because of the nested land ownership system and the cumbersome process of assessing "who owns what". Cotula (2007) indicated that where lands are owned by one tenure group, land registration becomes easy and fast. This explains why it is faster to register public lands than stool and family lands in Accra. The general picture can be attributed to the fact that most registered lands are family and stool lands as such even where there are public lands in the registration process, the same "delay culture" is applied. It can be added that speed of land registration processes does not only depend on the existence of one land ownership type but also on the functioning institutions responsible for the registration and the tenurial environment within that context.

- Causes of delay in the registration process

As part of the functions, Transparency International (2016) indicated that, double preparation of site plans, delays in the issuance of tax clearance certificate, official request for search report from Land Title Registry and the Public and Vested Land Management Division as well as deficiency of information on the status of applications by clients, affect the business processes of land registration. Surprisingly, this research found that poor coordination of functions, lack of monitoring, evaluation and assessment by the Lands Commission has resulted in the inefficiencies indicated above which delays the registration processes.

6.2.2. Objective Two: Verification and integration of user requirements and stakeholder contribution in Land registration processes in Accra-Ghana.

- User requirements

The purpose of user requirements in the research is to link customer and staff needs with the identified bottlenecks in the registration process and draw technical implementation mechanism to improve the process. User requirements serve as means of data gathering in the form of service quality, time, dissemination and storage for a well-functioning land registration (Didigwu & Olufisayo, 2016). In this study, it was discovered from the requirements that, most of the needs of the people can be analysed into three main themes; digitalisation and decentralisation of the system, reduction of the length of registration and security of document (non-compliance with scanning). These would help to improve the business performance of Lands Commission and open opportunity for further improvement in the existing system as indicated by (Todorovski, 2006).

Concerning decentralization, clients indicated the need to decentralise the system in the MMDA's to enable easy registration. Although this finding has economic importance, it is not possible because Accra lacks a complete cadastral system where all parcels are mapped despite the declaration of every part of Accra as Title Registration District**.** Recent research in Kenya shows that data standardisation and data interoperability is still an issue facing the implementation of its Land Information System (LIS) (Mburu, 2017).This, therefore, would create chaos regarding determining parcel size and parcel boundary when decentralizing the land registration system in Accra. Unfortunately, the unlocking of administrative commitment of policymakers would stimulate even the idea of decentralising the system.

- Suggestions for Improvement

The best alternative to tackle the decentralisation of the system would be to reduce the length of registration processes. Based on this we can infer that reducing the duration of the registration processes can be the first stage. Second, will be to decentralise it later after there is a complete cadastre in Accra. This can be achieved by a drive change in aggregating the processes through digitalisation but not to reform local land institutions as suggested by Mwangi et al., (2006), although, digitalisation has its consequences regarding security. The study has discovered that users require the digitalisation of land documents.

However, it was unanticipated that some clients do not prefer the scanning of documents. This is because clients have the perception that their documents are not secured because it can be edited by an official to another party. This implies that it is necessary to consider the security of clients' documents during the registration process. This would pave the way for an online registration system in future.

6.2.3. Objectives Three - To re-design a workflow model showing the processes and activities of land registration institution in Accra-Ghana and propose a recommendation for further actions

The design of workflow models facilitates land registration design and implementation. The design is based on lessons from literature. The activities of the land registration process have been analysed considering the present (Rationale for a change) and the proposed (process validation). The new workflow model is aimed at creating a single window for all the divisions where client request can be executed. This is dependent on the mechanism available at the Lands Commission to support its implementation.

The integration of the system into a single process window was based on Lemmen (2017) suggestion that the decentralisation of roles in the workflow model, makes the process faster. The integrated workflow model has revealed that decentralising the roles of the land registration process does not appear to determine the speed of the process, but rather a semantics behind the electronic and routing of the task supported by

a database. Phuong (2015) cautions that external database should also be linked to the workflow processes to avoid data loss.
This can be considered as a risk factor in the development and implementation of the workflow. This implies that the new workflow must consider external DBMS to keep records of data. This has the important implication of improving the land registration process.

6.3. Summary of discussions

The discussion has shown the need to remodel land registration processes in a digital format to ensure efficiency and transparency. Literature shows that, duplication of task causes delay in land registration process. This research has shown that, poor coordination of function results in the duplication, hence, delays the entire process. User needs has been realised to be reduction of processes, digitalisation and decentration of the land registration processes. However, these can be achieved through a complete cadastral. The chapter, finally, shows that decentralising the roles of the task in a remodelled process is based on the semantics behind the electronic and routing of the task supported by a database.

7. CONCLUSIONS AND RECOMMENDATION

7.1. Introduction

This chapter draws a conclusion and present recommendations for this research. Conclusions were drawn based on reviewed land registration processes, user requirements and the design of workflow management system. The chapter further present recommendations for policy actions, and further future research.

7.2. Conclusion

This research was aimed at ensuring efficiency in land registration in complex land tenure environment. Based on the research outcome, we can conclude that the Land Administration Project aimed to reduce the land registration process to three months have shown the reverse. Therefore, the idea of implementing Ghana Enterprise Land information system as the next project in Accra Lands Commission needs to take critical steps to avoid the problems of LAP. The conclusions drawn below opens the way for recommendations for each objective of the study.

Objective One: Review of the existing Land Registration System

The land rights recognized in the land registration processes include the leasehold, freehold, sublease and assignment. It has been realised that all these land rights keep changing. Especially from freehold to leasehold. However, these changes are predominantly rights held as family lands. This has the possibility of creating more problems at the registration point because it is the type of land ownership with no laydown regulatory procedures.

Among the three types of land ownership, state land registration processes have proven to be the fasters. Family and stool lands have been noted to be the vast owning lands in Accra with lengthy registration procedures. This creates room for the institutions of the Lands Commission and its stakeholders to overlap their roles with others, create redundant site visit, exercise wrongly verification and assessment of documents by different staff. This can be concluded that some of the division's responsibilities have been wrongly defined as such duplicate task and make some processes more redundant.

User and design requirements suggest that there should be personal dedication, monitoring, provision of logistics, and review of laws to clarify institutional roles to reduce the bottlenecks. Taken together, the research findings can be concluded that the reviewed land registration process complements other research that the multiplicity of tenure system with nested land rights put pressure on land registration institutions, hence creating bottlenecks along the land registration workflow.

Objective Two: To verify and integrate user requirements and stakeholder's contribution in Land registration processes in Accra-Ghana.

The potential users of the land registration system include people within the formal and informal sector. Results from users have proven that the land registration processes are confronted with poor coordination of functions, bureaucracy, inadequate logistics, inadequate staff, and corruption. Therefore, users suggested to reduce the land registration processes, decentralize the system, scan documents, and allow desktop inspection of survey and assessment of stamp duty. From the suggestion, decentralising the system would bring registration to the doorstep of the people, but it has a negative implication on data interoperability. The use of aerial images can be the starting point to enhance desktop parcel inspection and valuation.

Technically, system design requires absorbing processed reports, quick access to information, display of survey map and the ability to connect with other software programs. These have a significant implication that more significant efforts from the client (s) and design need of the land registration system would support the transition of the manual system of land registration to digital.

Objectives Three - To re-design a workflow model showing the processes and activities of land registration institution in Accra-Ghana and propose a recommendation for further actions

The new workflow discussed the rationale behind evaluating the existing system and validating the system for a new workflow model. The validation helped to remove task redundancy, wrongly definition of task and duplication of functions of the existing land registration system.

Overall, the new workflow model can facilitate the electronic and easy access to digital documents between the Lands Commission and the stakeholders, and secure recorded land transactions. Technically, the success of the model is based on the availability of experts, software's, and infrastructure. The performance of the model depends on the commitment and strong interaction between the Customary Land Secretariat, the Town and Country Planning and the Lands Commission.

7.3. Contributions to the study

In summary, the study has indicated some unique benefits that researchers and policymakers can follow to enhance land registration in the world.

- The analysis of the study shows a relevant guideline that can be followed to model land registration process in countries with similar tenure systems and institutional arrangements. i.e., review the existing land registration system, examine system and user requirement, and remodeling of the system. This complements the need for a change in thinking in research when analysing land registration systems more descriptively to model design and testing.
- The research provides a practical application of workflow management system in facilitating land registration. Therefore, this study has shown for the first time that, reducing the land registration process is the first step and decentralizing land registration process later as the mechanisms through which land registration can be enhanced using workflow management systems in nested land tenure environment.
- Administratively, the study has provided supplementary evidence that poor coordination of functions, undefined institutional roles, lack of dedication to work are the paramount causes of institutional bottlenecks that affect land registration in Ghana. This would empower Land Administration expects and policymakers to exploit the directions for change in the land registration process in other parts of the world.
- The research contributes to a growing body of studies that, the transition from manual to the digital system of land registration requires concerns regarding the security of scanned documents.

7.4. General recommendation

The land registration processes in Accra needs a digital approach. This can be achieved by ensuring a complete cadastre system for Accra which would facilitate digitalisation of the process. Major stakeholders such as the customary landowners, legal experts, Land Administrators, and Geo-information expects should be engaged in the design of a Land Information System using this model and other studies as basics.
Additionally, system implementers should be dedicated to duty and have a good mindset towards the implementation of the model.

7.4.1. Specific recommendation

The implementation of this model is dependent on the following recommendations

- All files need to be scanned at the Customer Service and Access Unit in front of applicants to the enabled digital flow of files in the model.
- Organisational roles should be stated and enforced to prevent the double performance of the task.
- Administratively, there should be a division responsible for monitoring, assessing, and evaluation, to supervise the activities and function of all the division. This would ensure consistency at duty and prevent the act of corruption.
- The Lands Commission should make the expertise of the Survey and Mapping Division relevant by providing them with the state of the art tools, finance, and logistics to provide quality survey and mapping services.
- The Customary Land Secretariat ought to be equipped with computers, databases, and server to enhance recordation and transfer of land right directly to the Lands Commission. They can equally be given full registration role when the processes are decentralized in the future.
- The institution responsible for preparing site plans should be spelt out by the Lands Commission. This would prevent the Town and Country Planning Department, private surveyors, and the Survey and Mapping Division to perform the same function of preparing site plans to clients.
- A platform should be given to clients to provide feedback on the registration process to ensure validation and informed decision for policymakers.

- There should be the motivation of staff. This would encourage staff to dedicate their time to work well.
- There is the need for policymakers to facilitate the implementation of laws governing the management and regulation of family lands. The law should spell out the registration institutions, and functions.

7.4.2. Future research recommendations

This study has thrown up few exciting establishment that could not be addressed. Future studies should concentrate on the following:

- The workflow model has not been technically able to display the assessment of stamp duty, ground rent of surveyed parcel. Therefore, another considerable area will be to test how satellite or aerial images could be used to conduct land valuation and the assessment of ground rent in the model. This would be an added value towards a smooth registration process in the model.
- Further research should explore the implementation of this model to a web interface where clients can easily access and apply online to ensure transparency.
- The proliferation of family lands ownership in Accra requires another research to determine how family lands can be consolidated to avoid future expansion of individual family lands with undefined land ownership and names at the Lands Commission.
- Once this study is conducted in Accra, a similar study should be conducted on the land registration processes in some parts of Ghana where one or two land ownership systems exist such as Ashanti region, Northern region and Eastern region. This would open avenues for the implementation of a Land Information System for the country.

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APPENDICES

Appendix 1 Research Workplan

	ACTIVITIES	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH
1	Research Proposal Writing									
2	Literature review									
3	Designing research Interviews and Questionnaires									
4	Field visit									
5	A. Interview with Lands Commission									
6	B. Interview with Customary Land Owners									
7	C. Administration of Questionnaire to clients									
8	D. Interview with Customary Land Secretariat									
9	Compilation of field results									
10	Additional data collection if necessary									
11	Analysis of results									
12	Thesis writing (chapter 1-6)									
13	Mid-term presentation									
14	Review of Thesis if any									
15	Submission of Thesis									
16	Thesis Defence									

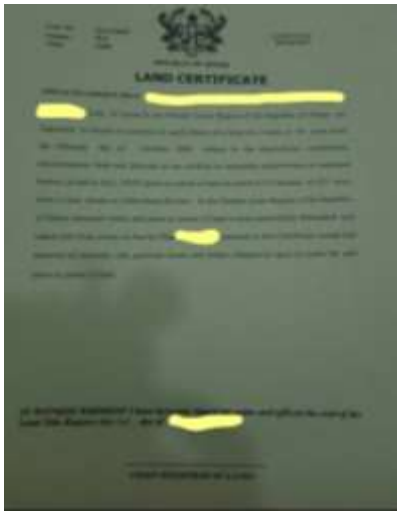
	SUMMARY OF RESEARCH PLAN	
1	PROPOSAL WRITING	JULY-AUGUST
2	PREPARATION FOR FIELD WORK	SEPTEMBER
3	FIELD WORK	SEPTEMBER-OCTOBER
4	DATA ANALYSIS AND THESIS WRITING	OCTOBER-NOVEMBER
5	MID-TERM PRESENTATION	NOVEMBER
6	THESIS SUBMISSION	FEBRUARY
7	THESIS DEFENCE	MARCH

Appendix 2 Back Coded site plan

Appendix 3 Sample of CSAU Application form

Appendix 4 Sample of Site plan

Appendix 5 Sample of Land Certificate



Appendix 6 sample of Stool land owners

GA/KORLE/GBESE STOOL LANDS
NINGO STOOL LANDS
PRAMPRAM STOOL LANDS
APLAKU STOOL LANDS
WEIJA STOOL LANDS
AKUMAJA STOOL LANDS
BORTIANOR STOOL LANDS
ADA STOOL LANDS
KPONE STOOL LANDS
OTUBLOHUM STOOL LANDS
SHIASHIE STOOL LANDS
APPOLONIA STOOL LANDS
AGBOGBA STOOL LAND
LOWERH STOOL OF DAWA
OFFICE OF THE MAMPROBI STOOL ADOKWEI WE

Appendix 7 sample of family land owners

NII ABOTSI FAMILY
NII AMARH SOGBLA FAMILY OF HAATSO-OSU
SACKERS FAMILY LAND (MAMPROBI)
NII ASHONG MLITSE FAMILY OF ODATEITSEWE-TESHIE
DOWUONA FAMILY LAND
NII ODAI NTOW LARGER FAMILY
NII DZAN-BI AMU ROYAL FAMILY
NII ARYEE FAMILY OF TOMA
OFANKOR AWULEMONAA AND NII KWARTEY OF KOTOKU FAMILY LANDS
ADJETEY AGBOSU & FREEMAN FAMILY
OKPELOR SOWAH DIN FAMILY NMAI-DZORN
TETTEY YUMU FAMILY OF LOWER KPONO OBONU, NINGO FIAWKONYA
ABLEWANKOR FAMILY
QUARTEY-PAPAFIO FAMILY
NII LARBI MENSAH STOOL FAMILY
NII AFUTU BREMPONG, WE TESHIE KROBO
NII NARTEY BORBORYOE FAMILY OF OSHIOKPO-DAWHENYA
NII ADDICO FAMILY OF PRAMPRAM

Appendix 8 Suggested improvement of the registration process process delays

	Frequency	Percent	Valid Percent	Cumulative Percent
Decentralization	49	32.7	32.7	32.7
motivation	6	4.0	4.0	36.7
staff recruitment	14	9.3	9.3	46.0
monitoring and evaluation	13	8.7	8.7	54.7
Resources	13	8.7	8.7	63.3
Processes reduction	51	34.0	34.0	97.3
public sensitization	4	2.7	2.7	100.0
Total	150	100.0	100.0	

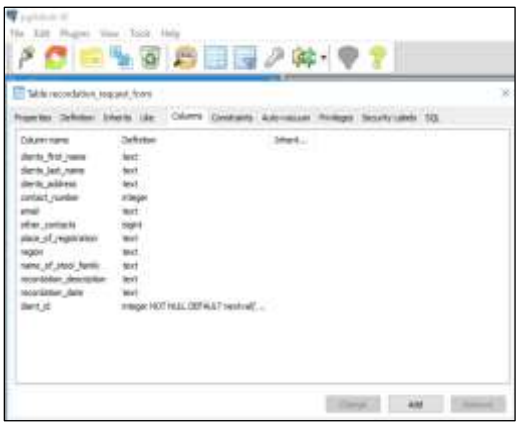
Appendix 9 Causes of Land registration

	Frequency	Percent	Valid Percent	Cumulative Percent
Inadequate land registration logistics	22	14.7	14.7	14.7
Poor coordination of functions	52	34.7	34.7	49.3
Bureaucracy	47	31.3	31.3	80.7
Inadequate staff	19	12.7	12.7	93.3
corruption	10	6.7	6.7	100.0
Total	150	100.0	100.0	

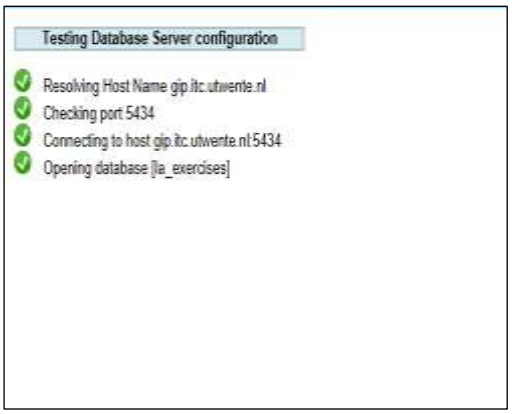
Appendix 10 New CLS Workflow form

Appendix 11 New CSAU Parcel search application form

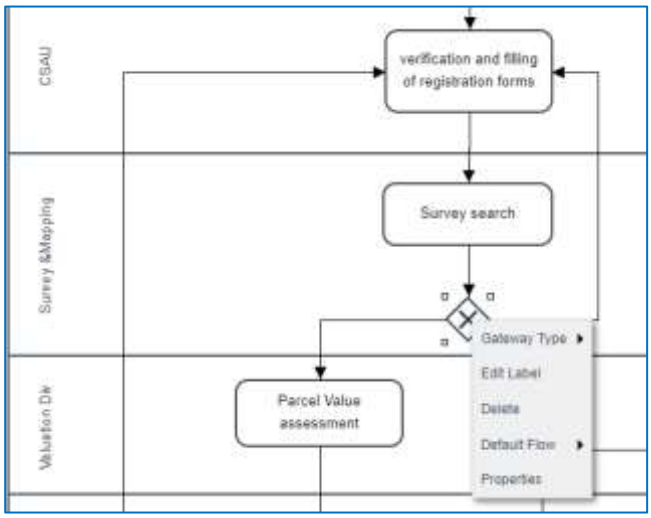
Appendix 12 Data recordation column



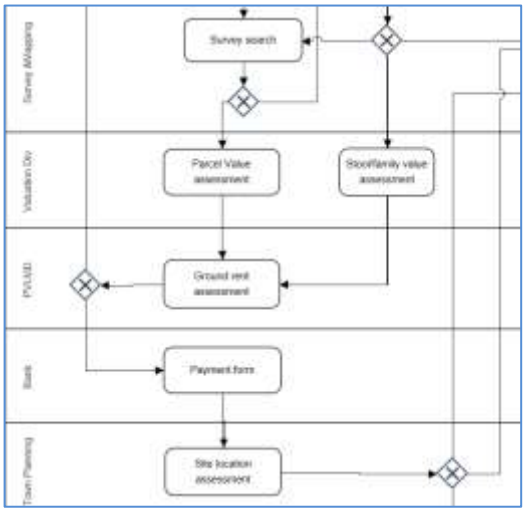
Appendix 13 Database testing



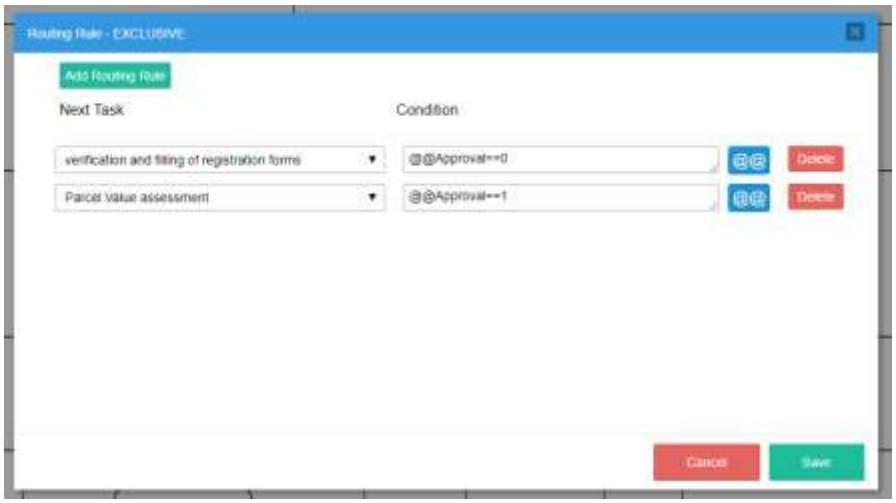
Appendix 14 process gateway



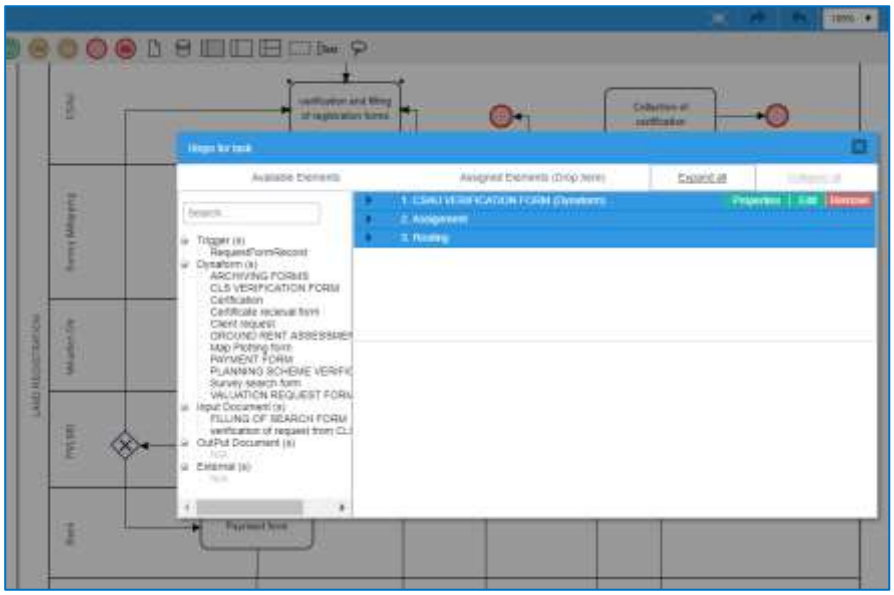
Appendix 15 Site assessment gateway



Appendix 16 Routing decision rule



Appendix 17 Assignment of roles



APPENDI 1: RESEARCH INTERVIEW GIUDE

To be filled in after the interview

Name of interviewee …….. …….. Optional

Location……

Organisation……

Status in organisation……

Educational level……

Date……

Length of discussion……

Objective of the interview: *To review the existing land registration process, and develop a workflow model to improve the land registration processes*

LANDS COMMISSION OF ACCRA

- **Client Service and Access Unit**

1. What are the roles of this unit?
2. Which regulations binds the activities of this unit?
3. What connections do you have with the divisions in the Lands Commission?
4. How many registration processes do you have, and what are they?
5. How many applications do you receive on average within a day, month, or year?
6. How many certificates do you issue per day/week?
7. Can you please tell me under what case can a document within the registration chain be withdrawn or delayed?
8. Which division within the registration chain delays the process? And what can be done to reduce that?
9. Do you think an integrated system of registration would help reduce the delays?
10. If Yes/ No, how and why?
11. Can you please tell me the practical challenges facing the land registration processes in general?

- **Public and Vested Land Management Division/Land Title Registration Division**

1. From which unit or source do you receive land documents for registration?
2. What are the roles of the division in the land registration process?
3. What are the land registration processes?
4. What are the requirements for all types of registration?
5. How long does it take to register a title or deed?
6. What is the shortest time the institution has used to register a title or deed?
7. What accounted for the speed in the registration process?
8. What is the longest time of registering a deed or title registration?
9. What accounted for the delays in the registration process?
10. What suggestions can be made to improve the registration processes at your level?

- **Lands Valuation Division**

1. From which division/unit do you receive land documents in the registration process?
2. What does LVD do with land documents received?
3. How long should a document ideally stay in the Division?
4. How long does a document last in LVD?
5. What is the next stage of the documents from the LVD?
6. What challenges does LVD encounter in processing land documents received?
7. How can these challenges be overcome?

- **Survey and Mapping Division**

1. From which division/unit does SMD receive land documents in the registration process?
2. List the various tasks SMD performs on land documents received?
3. How long is the surveying process for a document?
4. How long does it take SMD to process a land document received?
5. Where does a land document go from SMD?
6. What challenges do you encounter in surveying for a parcel and in processing its documents?

7. How can these challenges be overcome?
8. What are the practical challenges of title or deed registration in Accra
9. How can these challenges be improved/overcome?
10. What relationship does the commission have with the customary land secretariat?
11. How do land documents from the customary land secretariat facilitate land registration process at the commission?

◎ **Customary Lands Secretariat**

1. What are the land documentation processes in the secretariat?
2. What are the requirements for land documentation in the secretariat?
3. How long does the documentation process take place?
4. What are the importance of land documents from the secretariat?
5. How different is your land documents from those of the lands commission?
6. How complimentary is the land documentation of the customary land secretariat with that of the lands commission?
7. What suggestion can you make for improving land registration at the lands commission?

◎ **Ghana Enterprise Land Information System**

1. What are the functions of the unit?
2. What are your contributions to the registration processes?
3. What are your long-term plans towards ensuring a fast registration process?
4. How can that be achieved?
5. What are the practical challenges facing the unit regarding the modelling processes?

◎ **Town and Country Planning Department**

1 What are the roles of the department?
2 What is the relationship between the department and the Lands Commission and other stakeholders?
3 What role do you play in the land registration processes?
4 Which division of the lands commission do you receive documents from?
5 Can you explain the challenges of the department regarding the role played in the registration processes?
6 What suggestions can be made to enhance your work to ensure efficient land registration process

APPENDIX 2: SAMPLE QUESTIONNAIRE

Please fill in your details below

Name of respondent ……
Location ……
Type of land ownership ……

Objective of the questionnaire: *To verify and integrate user requirements in the Land registration processes in Accra-Ghana.*

1) Can you please tell me the purpose of registering your land?
   A. For sale
   B. Lease
   C. Use
   D. Other…….
2) What are the required documents requested from you? You can select multiple responses
   A. Indenture
   B. Site plan
   C. Allocation notes
   D. Other (if any specify) …….
3) In your view, how useful is the registration document from the Customary Land Secretariat at the Lands commission when registering your parcel?
4) Do you encounter any problems at the LC with documents from CLS?
   A. Yes
   B. No
5) If yes, what are those problems?
   ……
   ……....

6) If yes, can you indicate how such problem were/can be solved
   A. Using a common land documentation process
   B. Integrating the land documents into one system
   C. Formalising the customary secretariat
   D. Others (if any, specify) ……
7) How many months did it take you to complete a full parcel registration?
   A. Less than a month
   B. Less than or equal to three months
   C. Greater than or equal to three months
   D. More than six months
8) With respect to time for registration at each level, how do you rate them. Please tick from the row against each of the column

	Satisfactory	**Average**	**Poor**	**Good**	**Excellent**
Verification of documents					
Processing (Survey and Administration)					
Time lapse prior to certification					
Tax clearance processes (stamp duty and ground rent)					

9) Which of these processes takes the most time?
   A. Verification
   B. Processing
   C. Certification
   D. Tax clearance
10) What accounted for the delays in the process?
   A. Inadequate land registration logistics
   B. Poor coordination of functions
   C. Bureaucracy
   D. Lack of staff
   E. Other ……
11) Do you have to visit the registration centre to find out the progress of your documents?
   A. Yes
   B. No
12) if yes, how often do you visit there?
   A. Once
   B. Twice
   C. Thrice
   D. More than three

13) If No, how do you/officials contact you about the progress of the registration?
   A. By mail
   B. Through call
   C. By text message
   D. None
14) What suggestions can be made to improve or accelerate the land registration process?
   A. Motivation

B. Decentralisation
C. Process reduction
D. Resource
E. Others

Sample size determination

$$\text{Sample size (n)} = \frac{(Z\alpha/2)^2 \times P(1-P) \times N}{[(E^2) \times N] + [(Z\alpha/2)^2 \times P(1-P)]}$$

Where:
N= Total population size of clients = 1431099
P= The proportion of success of study area (50% of estimated frequency of sample size)
E= Total margin error = 10%
$Z\alpha/2$ = Value of confidence level at a precision of 1.96 of the study area

$$\frac{1.96^2 \times 0.5^2 \times 1431099}{[0.5^2 \times 1431099] + [1.96^2 \times 0.5^2]} = 99.96$$