ORGANIZATIONAL CHANGE DURING THE DIGITALIZATION OF LAND ADMINISTRATION: THE CASE OF THE SURVEY AND LAND REGISTRATION BUREAU OF BAHRAIN

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ABSTRACT

Many land administration organizations experience problems in the organizational change when transitioning from paper-based to digital systems. This is because the digitalization process involves a lot of changes in the organizations and its influence on work practice, which require changes in staff and techniques resulting from the adoption of digital technologies in the organization. This study shows that the digitalization process in the Land Registration Directorate in Bahrain has yielded some benefits, but still the land registration procedures are not fully digital and take place in parallel with a paper-based system. This study therefore investigates the nature of the digitalization process in the case of Land Registration Directorate of Survey and Land Registration Bureau in Bahrain as a case from the middle eastern region with emphasis on the organizational changes involved in the transition from analogue to digital technology.

To find out the nature of organizational change during digitalization a theoretical background, scientific literature and related publications were reviewed, and a conceptual framework was developed. Fieldwork was conducted in Land Registration Directorate in Bahrain in the form of primary and secondary data collection. The data analysis was informed by the themes discussed in the literature review, and findings from the analysis were used to fine-tune the conceptual framework.

The main findings are as follows. First, the digitalization process in the Land Registration Directorate of the SLRB can be characterized as relatively ad-hoc in nature. It has not been strategically planned, but instead takes place in response to both external and internal drivers and needs. Second, one of the main sources of resistance to digitalization and associated organizational change lies in the various factors arising from a generational gap. Third, the gap manifests regarding types of experience, skills, and attitudes towards digitalization, but also interlinks with organizational hierarchies. Furthermore, employees value the paper-based system for various reasons, which also forms a source of resistance to change to a digital system. Fourth, the Land Registration Directorate does not have a broad vision to guide the transition from paper to digital, and with the new financial position of the government of Bahrain the digitalization process has become further complicated and slowed down due to these financial constraints.

In conclusion, the study recommends Land Registration Directorate to understand and analyze the internal and external environment situation of the Directorate for organizational change in a more systematic manner, for instance by using a SWOT analysis to build strategies and to draw a roadmap for the process of digitization. Also, to minimize the gap between the generations, the Land Registration Directorate should not lose sight of continuity in building-up the awareness, knowledge, and capabilities of staff to support the initiatives for organizational change towards the digital system. Moreover, it is necessary to readjust the change management approach to be more inclusive of employees at different hierarchical levels and to foster transparency in communication with the employees about the change. Overall, a broad vision needs to be developed in groups comprised of old and young generations to consider the advantages and threats of both digital and paper-based systems and to find an acceptable roadmap for incremental development. While preventing the ad-hoc nature of digitalization described in this study, such development still needs to be flexible enough to adjust to contingencies and build on existing capacities. To support future development a review of the current laws and regulations to improve the digitalization process.

Keywords: digitalization, organizational change, resistance, SLRB, Land Registration Directorate, Bahrain

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1. INTRODUCTION

The introduction will provide background information regarding ICT implementation in the domain of land administration and describe related challenges. Based on this background the research problem is formulated and operationalized into research objectives and questions for the specific study of the nature of digitalization process in the case of Bahrain.

1.1. Background on ICT implementation in land administration and related challenges

Land administration one of major development to every economy. This is because, it involves processes of determining, recording and disseminating information about the ownership, use, and value of land (UNECE, 2005). One of the components of land administration is land registration which is concerned with the official recording of land ownership. As such it involves the official recording of legally recognized interests in land (Zevenbergen, 2002b). Land Registration ensures tenure security which enables people to access credit (Zevenbergen, 2002a).

However, according to Sandberg (2009), land registration in many countries is characterized by complex and long bureaucratic procedures and decisions on paper-based documentation systems. Many land registration systems have undergone the process of computerization, which involves the process of transforming registration system based on manually entered information to the automatic registration of digital applications. In the last decade, the idea of electronic land registration, whereby land registration is automatically processed and registered from the application stage to the final registration stage, has been brought into reality (Sandberg, 2009). Meanwhile, land registration in many countries is still handled through in paper-based systems with highly restricted access to records in the paper archive. The paper-based registration systems are characterized by long transaction time, and difficult and long times to retrieve and search for documents. This paper-based system provides space and opportunities for corruption. Furthermore, in the long run, paper records can be destroyed or damaged easily when there are a natural disaster and bad climate (The World Bank, 2014).

Recently, with rapid changes in information technology, users are demanding to have accurate information in faster time, for example, using digital land information systems. According to Acharya (2009), many organizations have moved from the traditional analogue system to the digital system, and applications are growing, that encourages government and the private sector to contribute to this growth. This acceptance of the transition to the digital system comes from a growing understanding of technology and its benefits, and the potential of this digital technology to extract detailed land information quickly and accurately (Acharya, 2009).

Many organization in the world are involved in implementing digital systems since 1980's (McCormack, 1992). In the case of government organizations, the use information and communication technology (ICT) is promoted to enhance public sector performance regarding efficiency and effectiveness. ICT promises to enhance the internal and external flow of information and activities of organizations thereby ensuring transparency in government performance. Heeks (2001), argues that it should be joined-up-thinking about creating a wealth of new digital connections from intranets to the Internet to support service delivery which enhances socio-economic development. Riley, Randall, Desai, Perfect, and Bussell (2002) adds that, the information should be transparent and accountable to citizens. UN-HABITAT define transparency as

"sharing information and acting in an open manner"(UN-HABITAT, 2004). It is evident in Minh Tam (2010) that access to a broader range of information and services leads to changes in the interrelationship between citizens, governments, and stakeholders, which makes government more efficient and democratic. The Internet service is considered as a convenient and cost-effective channel with respect to transactions and provision of information between government and citizens through an online network. Cao and Che (2007) refer to this as e-government. E-government is an efficient way of dealing with local, national and federal authorities through the Internet which is time-saving, reduce distance travel, simplifies and speed up procedures (Cao & Che, 2007).

1.1.1. Challenges in the process of digitalization in organizations

Despite the many actual and promised benefits of ICT implementation in government, in many cases, there are many challenges to digitalization, or the process takes a different path than what was expected or hoped. For example, according to Deininger and Goyal (2012), computerized land registries in South India were supposed to improve access to credit of lands, reduce corruption, and enhance the governance through simplification of procedures and automatic evaluation to eliminate officials in determining fees, digitizing all documents, and making them available online. However, according to the study, the computerized process did not result in what was expected, and it also did not eliminate the paper records, and rural staff still review and rely on paper records (Deininger & Goyal, 2012a). Tembo, Nkwae, and Kampamba (2014), argues that the transition to digital registration faces challenges which include the technical infrastructure being vulnerable to piracy, e-fraud, or disruption. Furthermore, governance context and social factor affect implementation. Research in Botswana, for instance, reveals that challenges were concerned with the legal framework, which, in its current form, does not permit the submission of digital documents (Tembo et al., 2014). Heeks (2002), stipulates that many implementation efforts of information systems can be categorized as total failure or partial failure.

Reasons for problems and often even failure of ICT implementation in government is related to the scale and complexity involved in organizational changes that are required to move from analogue to digital systems. For example, the move from analogue to digital results in changes of work phases. Parviainen and Tihinen (2017), for example, outlined the digital transformation as changes in the work methods, roles and business presentation resulting from the adoption of digital technologies in the organization or the operating environment of the organization. Also, they indicated changes at several levels. First, is the process level by adopting new digital tools and simplifying processes to reduce manual steps. Secondly, at organization level through the provision of new services, and providing of existed services in new ways. Thirdly, at business level changes in the roles of operators which could change the traditional intermediates in the supply chain and create new intermediates. Finally, at the social level the transformation to digital requires changing community structures (e.g., type of work, influencing decision-making) (Parviainen & Tihinen, 2017).

Given the various benefits, but also challenges addressed above warrants further research on the transition from paper-based to digital systems also in the domain of land administration.

1.1.2. Digitalization in land administration: the case of Bahrain

The Survey and Land Registration Bureau is the governmental body for the land registration and surveying services in the Kingdom of Bahrain. The land registration was developed at different stages and different periods. Because of these developments, The World Bank presents that the Kingdom of Bahrain ranked in second place in comparison with the Arabian Gulf countries and ranked 25 in the world for the year 2016. That report based on several indicators, including the digital registration process, which is one of the

essential elements that take into account the ease of transfer of ownership in the country (The World Bank, 2016b).

However, land registration in the Survey and Land Registration Bureau is operated based on both paper-based system and the digital system. Although land registration processes are still manual as traditional techniques and papers, many efforts have been made to transform manual processes into digital ones. The new title deed certificate has been changed from handwriting to digital printing, thus avoiding human errors and manual handwriting, which is incomprehensible, but still there is much on handwriting. Also, files were archived digitally by developing an archive system, but still there is also an archive paper system. Moreover, recently a workflow system has been set up that aims to automatically hand-over transactions between sections instead of moving files from one office to another. The system is supposed to start a trial of registration steps and is now in the pilot phase with the aim of reducing human errors and reducing transaction time.

While these digitalization efforts are taking place, the land registration process is also still going on through paper-based systems and in parallel to the digital process. That land registration law of 2013 in the Kingdom of Bahrain specifies that land registration must be in both paper and digital systems (Kingdom of Bahrain, 2013).

The transition from analogue to digital form of registration is a global issue in the land administration that needs a critical look at. It is therefore based on the discussions above that this study seeks to investigate the nature of the digitalization process in the Land Registration Directorate of Survey and Land Registration Bureau in Bahrain where both analogue and digital systems are still in use.

1.2. Research Problem

The land administration seems to be bureaucratic, slow and resistant to change. This is because organizational norms and standards are relatively rigid and sometimes deep-rooted in historical practices which are not easy to be changed even though shifting from tradition to new practices would be more convenient for the organization's performance (Zevenbergen, Vries, & Bennett, 2015). Many land administration organizations experience problems in the organizational transition from paper-based land registration to a digital system. Therefore, despite many organizations across the globe are moving to a digital system and digitizing their land records, some fail due to factors related to the legal framework, technological infrastructure, and social, organizational and human factors (The World Bank, 2016a). The digitalization process involves a lot of changes in the organizations and its influence on work practices, which could require changes in staff and techniques resulting from the adoption of digital technologies in the organization.

The transition from analogue to the digital system of land registration in Bahrain has yielded some benefits. However, there are obstacles that prevent the full transition to digital. This study will investigate the nature of digitalization process in the case of Land Registration Directorate of Survey and Land Registration Bureau in Bahrain as a case from the middle eastern region with emphasis on the organizational changes involved in the transition from analogue to digital technology.

1.3. Research Objectives and Questions

1.3.1. Main Objective

The main research objective is: to investigate the nature of organizational change during digitalization in the Land Registration Directorate of the Survey and Land Registration Bureau in Bahrain. That main objective is supported by the following sub-objectives:

1.3.2. Sub-Objectives

- To describe the digitalization process in Land Registration Directorate in Bahrain.
- To explore the digitalization process in terms of organizational structure and attitudes in the Land Registration Directorate in Bahrain.
- To identify the main concerns for future focused on for the digitalization process improvement within Land Registration Directorate in Bahrain.

1.3.3. Research Questions for each sub-objective

- To describe the digitalization process in Land Registration Directorate in Bahrain
    - What are the different stages in the general digitalization process of Land Registration Directorate?
    - What are the current benefits of the digitalization process for Land Registration Directorate?
    - What are the reasons for currently running a dual system: on paper and digital?
- To explore the digitalization process in terms of organizational structure and attitudes in the Land Registration Directorate in Bahrain.
    - How is Land Registration Directorate formalize and standardize the digitalization process?
    - What is the organizational attitude towards the digitalization process within Land Registration Directorate?
- To identify the main concerns for future focused on for the digitalization process improvement within Land Registration Directorate in Bahrain.
    - How does the Land Registration Directorate deal with the attitudes to the digitalization process?
    - What recommendations can be made based on identified concerns from this research?

1.4. Thesis Structure

Chapter 1: Introduction

Introduction chapter to this thesis provided background information regarding ICT implementation in land administration domain and describes related challenges. Also, a brief background on the case organization was provided. The problem of the research was formulated and the main objective of the study, sub-objectives, and research questions that guided this study based on background provided in the first sections of the introduction.

Chapter 2: Literature Review

The literature review chapter explains the concepts that are vital to this research and relate to knowledge of organizational change during the digitalization process. Then it provides a theoretical summary as a conceptual framework for this study.

Chapter 3: Methodology

This chapter explains the method used for this research, the material used for collecting data and the how this data was analyzed. This chapter also describes how sub-objectives were addressed and the resulting types of answers to the research questions in matrix form. It also illustrates the flowchart and the plan for implementing this research.

Chapter 4: Empirical Context: The Land Registration Directorate of SLRB Of Bahrain
This chapter further describes the empirical context of the case study for this research which is Land Registration Directorate of SLRB of Bahrain. It describes the SLRB's origin and the structure. Also, explains briefly on the background of the use of technologies in Land Registration Directorate and accessibility of land registration information and the land registration law.

Chapter 5: Finding from analysis
This chapter consist of the results obtained through semi-structured interviews, which were conducted in the Land Registration Directorate of the Survey and Land Registration Bureau in Bahrain, and legal and internal directorate documents. Those results are analyzed based on a thematic analysis, which followed initial research questions as well as themes derive from the literature and newly derived from data. It describes the stages and the benefits of transitioning to digital. Also, it illustrates the organizational change in terms of changes in organizational structure, organizational sources of resistance to change and the status of current formal organizational means to address the resistance.

Chapter 6: Discussion
This chapter discusses the literature in comparison with the identified main concerns of the findings from analysis chapter 5.

Chapter 7: Conclusion and Recommendations
This chapter summarizes the findings of the research according to sub-objectives, and it briefly discusses whether the objectives have been achieved based on the results. In this chapter suitable actions are suggested based on the discussion chapter to address the main concerns finding from this research.

2. LITERATURE REVIEW

2.1. Introduction

This chapter elaborates on research and concepts that are essential to this research and relate to broad areas of knowledge of organizational change during the digitalization process which provides a base for discussion chapter. Hence, this chapter is divided into total six sections. Firstly, section 2.2 gives the reasons for digitalization. Secondly, section 2.3 is focused on the expected benefits from the digitalization to the land registration organizations. Then it is explained how a digitalization process is a form of organizational change in section 2.4. After that, section 2.5 describes the adopted organizational change structure during digitalization which supports the digitalization process. Also, section 2.6 explains how the organizational attitude influences the digitalization process positively or negatively. Moreover, section 2.7 clarifies how formal organizational management drives the digitalization process to potential success or failure. Finally, the summary concluded this chapter in section 2.8 and will provide a conceptual framework for the research.

2.2. Reasons for the digitalization of land records

Many land registration systems around the world are using a paper-based system for the bookkeeping of land information records. In such systems are it is difficult, cumbersome and time-consuming to retrieve information. It also requires many resources for the data store. Maintaining land records through the manual system is usually a daunting task and often described as opaque (Habibullah & Ahuja, 2005). However, computers technology encouraged substantial administrative and institutional changes in land administration agencies and challenged them to improve their services since 1980's (Williamson, Enemark, Wallace, & Rajabifard, 2009). Therefore, the government agencies are trying to move towards creating and updating their land information infrastructure through the computer technology and is benefits to improve the land information delivery services (Shariff, Hamzah, Mahmud, Yusof, & Ali, 2011). The efficiency and effectiveness of land registration can be enhanced by computerizing the data. Over the past decades, many countries have succeeded in converting their land registration records from extensive collections of paper documents into computerized form (UNECE, 2005).

Bishop et al. (2000), stressed that availability of land information based on a paper-based system is weak or nonexistent. The land record that does exist is often outdated or restricted information. Also, access to land information on paper-based systems is complicated or could be impossible, and lead to aggravating the problem of sharing information efficiently (Bishop et al., 2000). According to Dale and McLaren (2005), the efficiency and effectiveness of land administration require resources, which in turn depend upon the availability of useful land information. So, computerizing the land records enable the creation digital land information databases would allow to more efficiently integrate, analyze, and distribute the land information (Dale & McLaren, 2005).

Shariff, Hamzah, Mahmud, Yusof, and Ali (2011) sees that implementation of Spatial Data Infrastructure (SDI) for land administration activities like land registration, taxation, and development can support the spatial governance. According to Enemark (2001), the best mechanisms for sharing geo-referenced information in a land administration is through using the Spatial data infrastructures (Enemark, 2001). The initiative of Spatial Data Infrastructure (SDI) is planned to generate a digital environment which all participants can collaborate with each other and interact using one central digital network, to achieve their objectives at different organization levels better. Rajabifard and Williamson (2001), argue that data-sharing using SDI is valuable, which allows the users to save resources, time and effort regarding acquiring new datasets. The use of SDI is avoiding duplication in obtaining and maintaining the datasets and will enable

the integration with other datasets. By reducing duplication and facilitating integration, SDIs can yield significant human and resource reserves and returns (Rajabifard & Williamson, 2001).

2.3. Expected benefit of digitalization for land registration

Digitalisation is very important in every country and has an impact on land transactions. Literature indicates that when property rights are in a digital form, this can have several benefits. Some of the benefits of digitalization are grouped into three main types, namely improving the productivity, ensuring legal certainty, simplicity in executing task and benefits to the citizens(clients).

Firstly, improving productivity is one major benefit of the digitalization of land records. According to Goyal (2012), digitalization of complete land registration information on property rights improves access to registry information which allows increasing the speed of land transactions completion. Also according to Deininger and Goyal (2012b), digitalization of land records can reduce the cost of keeping the property register up to date by removing informal side payments that have conventionally been related to property formalization. In brief, digitalization of land records could potentially increase the volume of land transactions that have been registered and reduce the magnitude of informality.

Secondly, digitalization of land records can also help to ensure legal certainty. Legal certainty can be improved since the parties' agreements are documented according to the legal requirements and the ways by which to make changes to the contractual arrangements are stored in a digital format. Vos (n.d.), buttresses this idea of legal certainty by indicating that after pre-evaluation of deeds parties can be confident that the details are well recorded as well as how the registration will change in the course of time. Also, Vos (n.d.), indicated that the notary would also perform their work more effectively and efficiently by pulling the data from the registers in a digital format without retyping the data. This reduces the duplication in entering data and reduction of clerical errors through ensures the availability of digital data.

Thirdly, simplicity in executing tasks is improved. Another importance of digitalization of land records is the simplicity in the performances of the task by the officers in charge. For example, according to Toaha and Khan (2008), digitalization of land records makes the work simpler and helps the retrieval of registered records. It also makes the processing of documents very fast since it reduces time in transferring property rights from one person to another saving land registry and applicants considerable time (The World Bank, 2016a).

Lastly, digitalization of land records can benefit the applicant for land registration. The applicant can access information on the register digitally. This saves them time in traveling long distances to the land registration offices to make inquiries and so on. According to Vos (n.d.), when the Notary spends less time with files as a result of digitalization, there is a possibility that the prices may be reduced and there is also some level of transparency concerning data access by the applicant.

Despite expected benefits, the digitalization process in organizations, especially in government and other large institutions, takes time and is difficult, because it is not only a matter of technology conversion, but it entails the need to make larger organizational changes. Digitalization can therefore be conceptualized as a process of organizational change.

2.4. Digitalization process as a form of organizational change

Digitalization of land records can enhance the flow of information and activities of land administration organizations, but there are also some considerations towards digitalization process of land records. Despite the importance of digitalization of land records enumerated, practicing digitalization is not a straightforward

task in different global context. According to Wamukoya and Mutula (2005), some of the problems faced in the management of digital records are: obsolesce of technology, nonstop digital migration as well as deterioration of the digital material, ability to delete information without trace to just mention a few. Tembo, Nkwae, and Kampamba (2014), also point out that digitalization of land records has many challenges including technical infrastructure considerations which will enable the clients or the citizens to access the registry information without compromising its security. According to Parviainen & Tihinen (2017) digitalization is defined as "changes in working methods, roles, and business presentation caused by adoption of digital technologies in an organization, or in the operation environment of the organization". Importantly, the digitalization process is not one of simply replacing one technology for book-keeping of land records with another advanced technology. The process requires changes in the work methods, roles and business presentation resulting from the adoption of digital technologies in the organization which in turn leads to further organizational change.

Petrescu (2010), defines organizational change as a strategic effort to enhance the performance capabilities of organizations to improve their services. Organizational change usually occurs when people understand the need for a new approach, technology, and processes that are productive, effective, and efficient to serve the people. King, Felin, and Whetten (2009), argues that some organizations resist the change because of their desire for virtual stability and predictability. The early development of organizational change in land administration is mostly geared towards the merging and digitalization of land records (Hilhorst, 2014). Enemark (2010), argues that, due to a large amount of paper data available in most land administration organizations, most land administration organization have changed their organization roles of moving to digital to support taxation, planning, and management of natural resources. These latter processes involve various departments and organizations within the administration of a country or region. Therefore, the organizational change necessary during digitalization is influenced by both the structures around a given organization, e.g., a government department or level of administration, as well as the structures of and within an organization.

2.5. Organizational structure to support the digitalization process

Before moving towards in digitalization process, several considerations must be followed to support the digitalization process. According to The World Bank (2016), that must be taken into account include legal framework, technological capabilities, human, social and organizational factors.

Firstly, according to the World Bank report, the first step that must be taken before embarking on digitalization is the revision of the legal framework. Unclear legal frameworks can serve as an impediment to the implementation of digitalization of land records because of outdated legislation or lack of support for the digitalization or missing of digital land record acts. To illustrate that point, the report indicates that, in Guinea Bissau, for example, tiles were required by law to be handwritten and therefore could not be processed by a computer. Tembo, Nkwae, and Kampamba (2014), argue that all the legislation related to the digital initiatives in land administration should be reviewed to support the digitalization process.

Secondly, creating technological infrastructure and choosing appropriate technology is essential for developing a new digital system and to support the sustainability of that system. The World Bank report indicates that different stages of development require different technology solutions that take into consideration both limitations and constraints. According to Eatock, Giaglis, Paul, and Serrano (2000), the technology to be used should be within the capacity, objectives as well as the resources of the organization. The infrastructure of those capabilities includes the databases, security of the systems, hardware, software, access to the power, access to the internet.

Thirdly, human, social and organizational factors are very critical in the digitalization of land records in every country. This research concentrates on the internal organizational issues. Skilful human resources are there to keep the digitalization systems performing effectively and efficiently. To maintain the digitalization systems, it is imperative to develop local capacity capable of handling the tasks. According to the Doing Business Report of The World Bank, 2000 Croatia land registry employees were trained on the new information system technology. Also, the organizational factor plays a vital role in the digitalization process because many of organization are resist the digitalization due to those employees who are working in the traditional paper-based system who see the change as a threat their jobs and power with changing to a digital system (Alshehri & Drew, 2010).

In Summary, the process of digitalization within an organization is not only a matter of changing a traditional manual work to a new advanced work environment, which has been used for many years. However, it requires changes at two levels related to the organizational structure: the larger legal framework according to which organizations are structured, and the organization's internal human and technical factors and capacity. One important human factor in the organizational changes are people's attitudes towards change and various reasons for resistance.

2.6. Attitudes towards organizational change

The organizational attitude toward the changes to digitalization influences the process either to positive or negative. Also, the attitude of the staff during digitalization would affect the organizational culture behavior. Weerakkody, Omar, El-Haddadeh, and Al-Busaid (2016), indicate that when the complexity of work in an organization is digitalized, work becomes less bureaucratic and less complicated. Rajabifard and Williamson (2001), argue that the digital data-sharing environment allows saving resources, time and effort regarding acquiring new datasets. Despite the positive organizational changes attributed to digitalization the employees of the organizations often resist of and oppose the changes.

Boohene and Williams (2012), argue that despite the execution of organizational change for positive reasons, employees often respond undesirably toward the change and resist the change effort. Resistance to organizational change occurs when employees behavior stands in opposition to the new changes situation in the organization (Folger & Skarlicki, 1999). Oreg (2006), defined resistance to change as a negative attitude towards change, which includes behavioral, and mentality of employees in the organization. Most changes according to Armenakis and Bedeian (1999), during organizational transition results in pressure, tension and doubt for employees' job security. Therefore, employees must gain new competence and skills to be able to communicate with the new digital system.

The causes of resistance to change include; lack of communication with the employees, staff being unaware of organization's objective, undesirability of new knowledge and skills that need to be required, organizational structure, and limitation of resources (Zafar & Naveed, 2014). Yılmaz and Kılıçoğlu (2013), argue that one of the causes of resistance to change is coming from employees who are not recognizing the need for change. Resistance to change also comes from the employees whose fear of job insecurity, change in employment levels, loss of job satisfaction, differences in wage rates and cost to individuals over work control (Mulins, 2010).

While these attitudes at the individual level and organizational level are important factors influencing how transitioning from paper to digital systems takes place, the success and failure also depend on the manner, in which the process is driven and managed.

2.7. Formal organizational change management

The formal management of the organizational change during digitalization is an important driving instrument for a successful transition. Durant (1999), explains that the success of organizational change of digitalization must serve the future needs of the organization and the stakeholders. This is an important role that management plays. It needs to consider the internal situation of the organization, but also the future needs in order to adapt to changes in the external environment through analyzing the opportunities and threats surrounding the organization, and by analyzing its current internal strengths and weaknesses that would influence the organizational change. Jacobs, Witteloostuijn, Christe-Zeyse (2013), add that the reasons, why organizations move to digital is related to the external opportunities and threats that may affect the organization. Similarly, the internal strengths and weakness can affect the digitalization transition (Jacobs et al., 2013). The external influencing factor of change derive from customer expectations, external requirements to improve in quality and standards, government legislation and political values that affect changes in the economy (Luna-Reyes & Gil-Garcia, 2014). The internal influencing factors of change derived from employee's behavior, organizational culture, mission statement, and the leadership style that would affect the change (Jacobs et al., 2013).

Also, if the organizational change planned for changing the responsibilities of individual employees, then, communication and information with employees about the change is essential for the transition (Thomas & Hardy, 2011). Communication issues should include the motivation for change, discussion of expected events, and new work roles of employees (Battilana, Gilmartin, Sengul, Pache, & Alexander, 2010; Bovey A, 2001). Radzi (2016) also adds that organizational resistance to change can be reduced if organizations control the flow of information, create room for staff consultation and participation and grow trust in the management of organization functions. Serban and Iorga (2016) describe how to prevent the resistance to organizational change in five actions. First, there needs to be training of those involved in the changes to educate them about the change before the implementation and help them to recognize the importance of changes. Second, the effective communication needs to be clear, transparent and honest regarding the changes that will happen and their impact. Third, there needs to be positive motivations for those who involve in the help of the goal achievement of changes. Fourth, employee need to be involved in the process of changing because people support the initiative they are involved in and bring from their experience, creativity, and commitment through the contribution in the change process. Finally, involving the general managers or board members of the organization in the process of changes for taking care of the opposition attitude in the process and addressed that opposition.

2.8. Summary and Conceptual Framework

Many of land registration systems around the world are using a paper-based system for the bookkeeping of land information records. The availability of land information using a paper-based system is weak and often outdated or restricted information. Also, access to land information in paper-based systems is complicated or could be impossible, and lead to aggravating the problem of sharing information efficiently. So, the digitalization of land records enables the creation of digital land information databases, which is allowing to integrate, analyze, and distribute the land information efficiently. Digitalisation is considered to be very important for every country, because of the benefits for the land registration organization attributed to digitalization, including increase the productivity, ensuring legal certainty, simplicity in executing task and benefits to the citizens. However, practicing digitalization is not a straightforward task in different global context because the digitalization process requires and results in changes in the work methods, roles and business presentation, and organizational change more broadly. So, digitalization process can be conceptualized as form of organizational change. Moving towards in digitalization process therefore requires several considerations to support the transition, which includes a legal framework and technological

capabilities. Also, the attitudes towards the organizational change to digitalization are influencing the process either positively or negatively. Moreover, the formal management of the organizational change during digitalization is an important driver of success in the process. This literature review chapter is summarized in the conceptual framework as shown in figure one. These themes also inform formulation of sub-objectives and later thematic analysis.

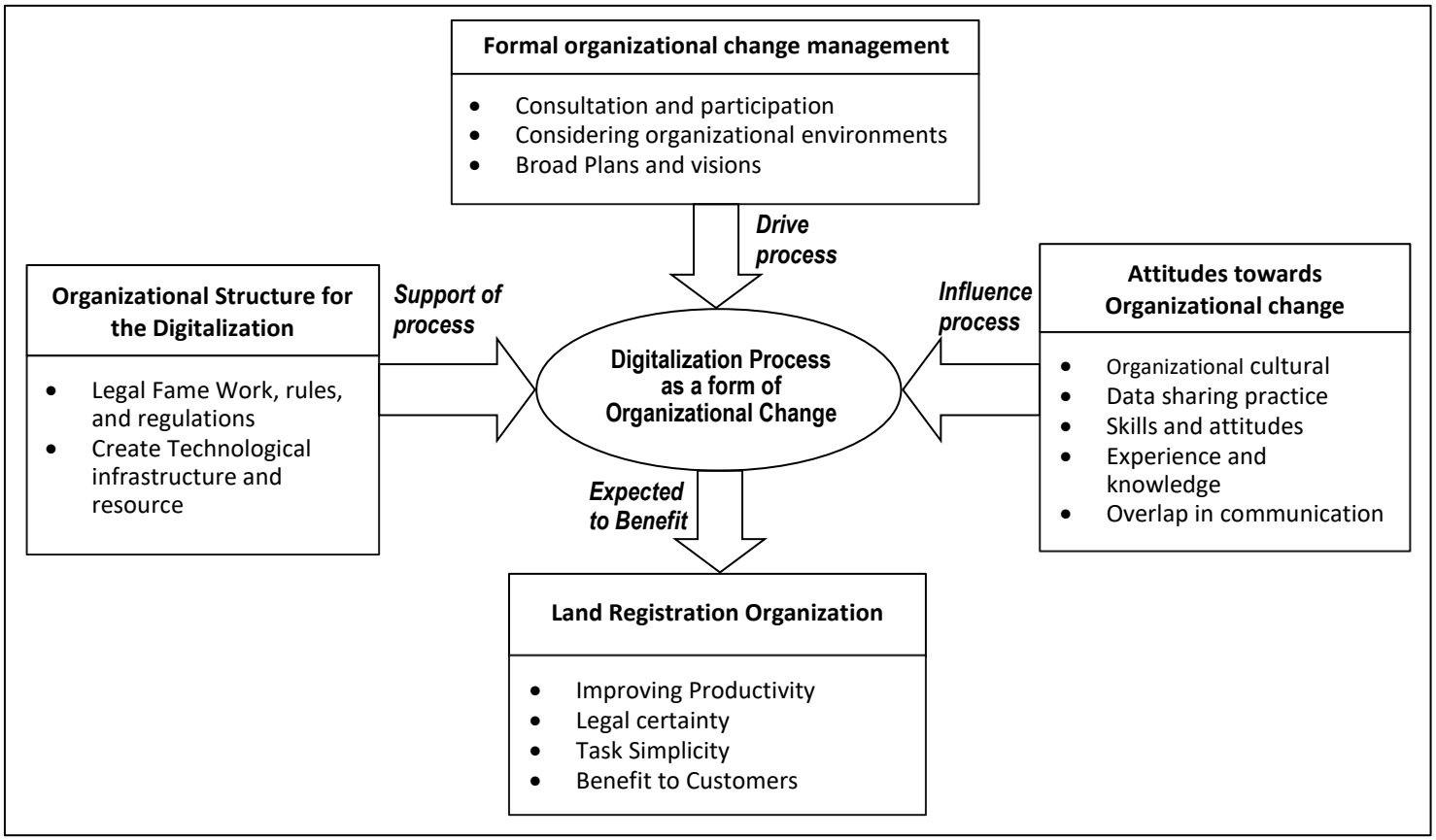

Figure 1 Conceptual Framework

3. METHODOLOGY

3.1. Introduction

This chapter describes the design used for research, the material used for collecting data and the how this data was analyzed. This chapter also describes how sub-objectives were addressed and the anticipated types of results for the research questions in matrix form. It also illustrates the workflow in form of a flowchart and the plan that was used for implementing this research.

3.2. Research Design

This research design can be described as a case study (Bryman, 2012), where the case is the Land Registration Directorate of Bahrain as the organization for this research. The study is of a qualitative nature, because mainly semi-structured interviews were used for data collection alongside secondary information from the internal reports and legislation of the Directorate. This qualitative method explains the current process of digitalization from the perception of the Land Registration Directorate in Bahrain. Also, the analytical framework based on the literature review is used to understand the factors influencing the digitalization process and their challenges. The main factors to focus on for the digitalization process were then derived from the description and factors explaining the digitalization process. The contextual understanding of the case by the researcher, who is an employee of the Land Registration Directorate, also helped in the interpretation and triangulation the qualitative data.

3.3. WorkFlow

The research is designed in three stages (see figure 2). The first stage is the pre-fieldwork stage and involved searching for the essential concepts from the literature. It was obtained through desktop research. The literature was collected from many resources like books, scientific papers, journals, official international reports, conferences proceedings, web pages, etc. This information was used for the justification and to provide the main concepts. The second stage of this research was the fieldwork. In this stage, the primary data was collected through the semi-structured interviews in the Land Registration Directorate in Bahrain. Also, secondary data was collected at this stage in form of legal and directorate internal documents from the organization, which is related to the digitalization process. The third stage of this research was after the field work. In this stage, the data were processed and analyzed; and the results described and discussed using thematic conceptualization framework base on the literature review. After that, the conclusion and recommendation were written.

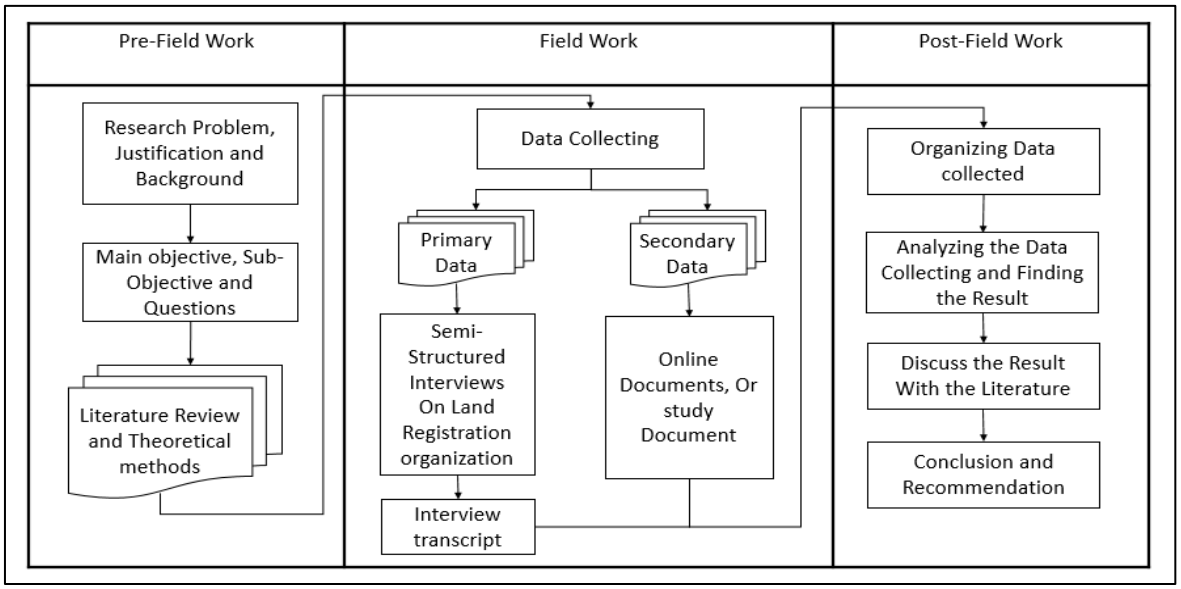

Figure 2 Research Stages

3.4. Research Scope

The research fieldwork for collecting data was conducted in the Kingdom of Bahrain. The Kingdom of Bahrain is an archipelago of 40 islands, with a total area of 767.26 square kilometers and population approximate of 1.5 million. Bahrain is a small island, there is only one national government under the Prime Minister, and there are no administrative governments like provinces or districts but just one national level.

For this research, a study was conducted in Survey and Land Registration Bureau (SLRB) which is the governmental body for surveying and registering the lands and properties in Bahrain and provide related services. The main mandate of SLRB is to protect and secure the ownership of the properties in Bahrain. SLRB is taking care of all property transactions of all citizen, as well as private and government owned land (Kingdom of Bahrain, 2013).

This research focused specifically on Land Registration Directorate within the SLRB, because this directorate is still working in both paper-based system and digital system and as such promised to provide good insights into the transition processes from paper to digital system. Land Registration Directorate records are mostly based on the paper-based system. So, many of the processes are done manually. Until 2004 the transactions were completely paper-based and registered in books and on paper maps. In 2005 the Land Registration Directorate started digitizing those paper documents and ensured that all transactions were updated digitally when it is complete. In that period all property transactions papers were scanned and kept in a digital archive system. Also, all handwritten property information in paper maps was captured on the geospatial platform and displayed on the digital map (Kashram & Dixit, 2014). Therefore, the transformation to digital has started, but has not eliminated the paper-based system. It has also been decided that the land registration system will not support the full transition to digital and the last update for the land registration law mentions that registration system should proceed in both digital and paper-based recordation (Kingdom of Bahrain, 2013).

3.5. Data collection

The data collected in this research is constituted of two types of data: primary and secondary data. The secondary data collected from Land Registration Directorate are legal and internal directorate documents

which are relevant reports to trace the digitalization process. The primary data were collected in fieldwork using semi-structured interviews in the Land Registration Directorate (see Appendix C). Also, supplementary semi-structured interviews were conducted with the notary office of Ministry of Justice and with customers of the Land Registration Directorate.

The semi-structured interview method was chosen to avoid the limitation in answering the interviews questions that follow a framework to address the fundamental themes. In this type of interview, the interviewer has a list of subject to be covered but may not follow on exact outlined order (Bryman, 2012). During the interview, the interaction between the interviewee and the interviewer bring more comfortable way to explain the questions and brings the follow-up questions and summarize the answers to ensure the broad understanding. Moreover, this type of interview is a primary method for this research.

3.5.1. Selection of interviewees

The selection strategy used for this research was done through purposive sampling. According to Bryman (2012), "purposive sampling is to sample cases/participants strategically so that those sampled are relevant to the research questions that are being posed". So, the key informant interview respondent for this research was chosen from the Survey and Land Registration Bureau specifically from the Land Registration Directorate in Bahrain. The selected interviewees are based on the long experience and practice in the Land Registration Directorate. Those chosen interviewees were various from legal advisors, registrar section, Deed section, archive section, technical affairs and IT section which they have involved in the land registration digitalization process (see Appendix A).

Legal advisors contributed in explanations of the laws, the reasons behind having two systems in the land registration law paper-based and digital system, and legal support for the digitalization process. Land registration advisor, registrars, archive, and deed sections contributed in explaining the digitalization process background and benefit from this digitalization process. The technical affair director and advisor, land information section and IT contributed to explaining the infrastructure capacity and challenges for implementing the digital systems and the plan for digitalization process. Also, all of the respondents contributed in describing the organizational attitude and the manner of formal change management of the Directorate.

Moreover, based on the results from the first round of interviews, there was a need to conduct three more supplementary interviews in January. One interview was done with Notary office from Ministry of Justice and two interviews with Land Registration Directorate customers in order to further deepen insights on the benefits from the digitalization process in Land Registration Directorate, which had been identified in the first set of interviews in Land Registration Directorate.

In whole nine semi-structured interviews were conducted with Land Registration Directorate, two semi-structured interviews with the Land Registration Directorate Customers who are regularly dealing with the Directorate, and one semi-structured interview with the Head of the Notary Office from Ministry of Justice. The topic guides for the interviews are included in Appendix B.

3.5.2. Analysis

After transcribing the interviews, a thematic analysis was conducted. Thematic analysis is one of the most common approaches in qualitative studies, where the data are categorized into a matrix form according to themes from literature, theory or the data itself (Bryman, 2012). In this study, the analysis was informed by

the themes discussed in the literature review, which are summarized in the conceptual framework and indicated in the research questions (see table 1, research matrix, below).

3.6. Research Matrix

The research matrix (table1) represents how the specific objectives are achieved, what type of data are used, and the collection methods used for this research. In addition, it presents how those data are analyzed and also what are the results from analysis.

Specific objective	**Research questions**	**Data Type**	**Collection Method**	**Data processing and Analysis Method**	**Results from Analysis**
To describe the digitalization process in Land Registration Directorate in Bahrain	What are the different stages in the general digitalization process of Land Registration Directorate?	Primary Data Secondary Data	-Semi-structured interview - Legal and directorate internal documents	-Interview transcriping -Thematic analysis (Stages, type of benefits, and reasons for dual system)	-Description of digitalization process according to stages and the internal and external drivers (section 5.2)
	What are the current benefits of the digitalization process for Land Registration Directorate?				- Benefits described in three main type, one as Internal and two for external benefits for changes (section 5.3)
	What are the reasons for currently running a dual system: on paper and digital?				-There was no direct findings analysis for this question, but it is a combined with findings of section 5.4.2, 5.5, and 5.6
To explore the digitalization process in terms of organizational structure and attitudes in the Land Registration Directorate in Bahrain.	How is Land Registration Directorate formalize and standardize the digitalization process?	Primary Data	Semi-structured Interview	-Interview transcript -Thematic analysis (Formalization and standardization, reasons and source of resistance)	-Description of two main measures to support the digitalization process changes (Technical and Legal support in section 5.4)
	What is the organizational attitude towards the digitalization process within Land Registration Directorate?				-Description of organizational reasons and sources of resistance to digitalization (section 5.5 and 5.6)

To identify the main concerns for future focused on for the digitalization process improvement within Land Registration Directorate in Bahrain.	How does the Land Registration Directorate deal with the attitudes to the digitalization process?	Primary Data	Semi-structured Interview	-Interview transcript -Thematic analysis (formal change management to address the resistance, and main concern)	-Description of the formal actions to address the resistance to change and the main concerns to Land Registration Directorate (section 5.7)
	What recommendations can be made based on identified concerns from this research?				-List of suitable solutions to address the main concerns that affect the digitalization process (section 7.3)

Table 1 Research Matrix

4. EMPIRICAL CONTEXT: THE LAND REGISTRATION DIRECTORATE OF SLRB OF BAHRAIN

4.1. Introduction

This chapter provides an overview of the empirical context of Land Registration Directorate of SLRB of Bahrain. The data for this chapter is a secondary data collected from Land Registration Directorate during the work to trace the digitalization process. It describes the origin and the structure of SLRB. Also, the chapter explains briefly on the background of the use of technologies in Land Registration Directorate and accessibility of land registration information and the land registration law.

4.2. Origin of the SLRB

The Survey and Land Registration Bureau (SLRB) was established with the aim of protecting and maintaining registration of real estate ownership in Bahrain (SLRB, n.d.). The SLRB was first established in the 1920s as the Tabo Directorate and then restructured and renamed to the Land Registration Directorate in 1967 (Hamza, 2006). Multiple organizational changes consolidated the registration and survey functions, which were previously under the control of the Ministry of Justice & Islamic Affairs (MOJ) and the Ministry of Housing respectively, resulting in the official establishment of SLRB in 2002 (Hamza, 2006).

4.3. Organization structure of the SLRB

The SLRB is divided into three general Directorates; Surveying, Land Registration, and Resources & Information System (SLRB, n.d.). These general directorates report directly to the Head of the SLRB as showing in figure 4. The Land Registration General Directorate is divided into two parts; namely the Registration & Follow Up Directorate and the Technical Affairs Directorate (TAD). The Registration & Follow Up Directorate is responsible for processing registration transactions and recording the associated data into the paper archive and digital databases. TAD is in charge of providing various services such as registering and safekeeping of land and property information into the information system and coordinating with other departments and ministries to provide them with needed data. The General Directorate of Surveying is divided into three directorates which are responsible for covering all aspects of surveying, including cadastral, hydrographic and topographic surveying.

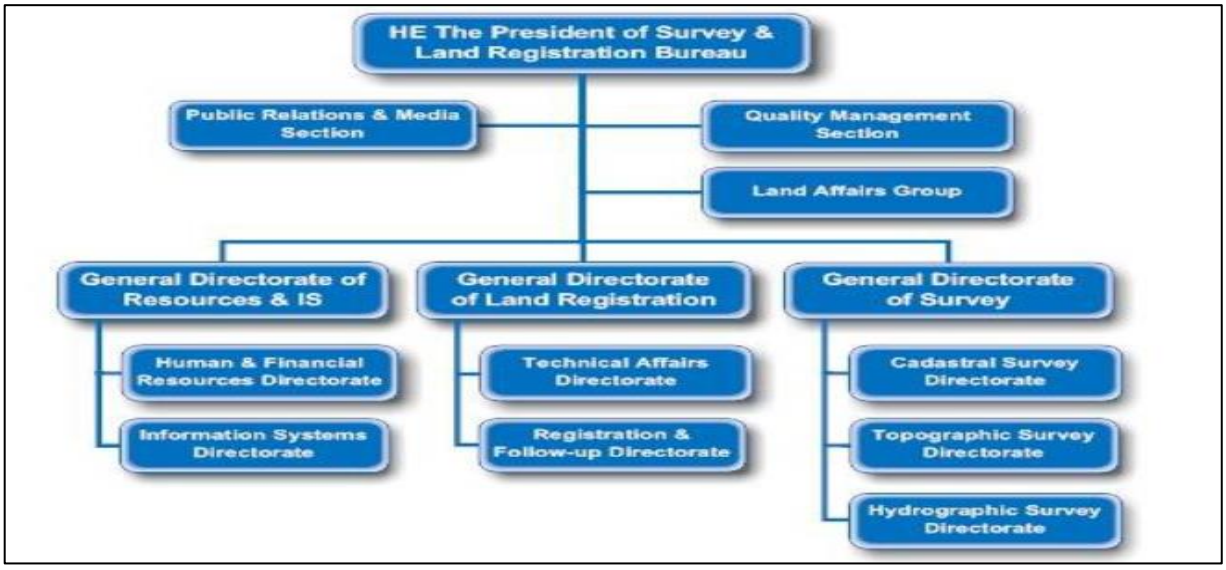

Figure 3 Organization structure of SLRB (SLRB, n.d.)

4.4. Accessibility of Land Registration Information

Land registration information is critical for a wide range of public and private stakeholders. Information such as ownership details and land values can assist multiple purposes, e.g. securing land and property ownership (KPMG, 2013). The public has only limited access to land registration information held within the SLRB due to the sensitive nature of the information (Dewfield, 2013).

4.5. The use of technologies in Land Registration Directorate

The Land Registration and Surveying Directorates merged in 2002 from different governmental bodies (SLRB, n.d.). Apparently, since those functions were under different management, inequality in the levels and use of technology exists among the general directorates. For example, the Cadastral Survey Directorate has automated its processes earlier than the Land Registration Directorate (Hamza, 2006). However, the Cadastral Survey Directorate has been computerizing the whole mapping procedures since the 1990s, while TAD which is under the land registration directorate computerized its paper-based map system later in 2004 (KPMG, 2013).

Operationally, some interruptions have emerged between the general directorates due to the unsynchronized technology upgrades which affected inter-departmental communication. For example, the Cadastral Survey Directorate continually sends updated cadastral maps to TAD via email instead of sharing information through the linked network (KPMG, 2013). Due to this current sharing method, information is not promptly updated, resulting in process delays. So, the SLRB has attempted to bridge the technological gap by implementing new technologies. However, it has been difficult to obtain a consensus on this and has therefore been slow to implement.

4.6. Land Registration Law

The land registration law has not been amended in 34 years since it was issued in 1979. The law mandates the use of a manual logbook to record all land registration transaction until 2013. In 2013, the land registration law was amended to introduce the digital registration, but did not rule out the manual registration of land in the logbook, and instead required to operate both manual and digital systems (KPMG, 2013). As a result, duplication of efforts exists as staff needs to record transactional information both digitally and in the manual logbook (Dewfield, 2013). The double entry of details increases the processing time and adversely affects the Directorate's performance.

5. FINDINGS FROM ANALYSIS

5.1. Introduction

In this chapter, the results obtained through semi-structured interviews, which was conducted in the Land Registration Directorate of the Survey and Land Registration Bureau in Bahrain, and legal and internal directorate documents are analyzed based on a thematic analysis. This is done based on the structure of, the initial research question and themes. First, the stages of transitioning to digital work in the Land Registration Directorate will be described and the benefits of such transition. Second, the organizational change will be analyzed according to three relevant themes: the organizational structure, organizational sources of resistance to change and the status of current formal organizational means to address the resistance. While these themes had been anticipated in the conceptualization of the research proposal in the form of research questions, they emerged as especially important during analysis after fieldwork and hence emphasis is put on these in the following sections.

5.2. Stages of digitalization process: internal and external organizational drivers of change

The drivers behind the digitalization of records and implementation of related information systems can be broadly categorized into drivers of organizational change that are internal, and those that are external to the organization. Here, the organization in this study is the Land Registration Directorate, itself a sub-unit of the SLRB.

With respect to intra-organizational drivers, the idea of moving to digital began by thinking about the huge amount of paper in the Land Registration Directorate and the way it was stored in the 1980s. It was noticed that if an event occurred, that would damage this amount of paper, whether natural disaster or fire, etc. or from poor storage and loss of this document for many reasons. "*The result of that thinking was to have copies of this amount of paper in the films (Microfiche), and this step helped in saving only but did not dispense with the old paper files, so the paper files have copies in the films"* (Land Registration Advisor on 05-10-2017). It was further recognized that mistakes in the past, which resulted from manual work using paper and pens led lead to various related problems in the chain of work of record keeping. For example, when a court order is issued against the property of a person, but another person becomes affected because of wrongly noted numbers related to the respective persons. The digitalization of maps took place later, but it was also related to shortcomings of organizational internal processes and work. *"Until 2002 the daily land registration records were being processed manually on 4000 A0 paper maps with different versions and using pens. Once a paper map became clattered it became illegible to employees and they requested for a new paper map"* (Technical Affair Advisor on 09-10-2017). This situation led to incomplete and inconstant records, for instance through an incomplete numbering, unexpected erasing of numbers, which in turn affected the whole registration process.

The shortcomings of manual recording on maps and a massive amount of wrong information in the past were one of the most important reasons for deploying and continuing to develop a digital system. The aim for the application use of the digital system has been and continues to be the creation and maintenance of more accurate. A second reason for initiating efforts to implement a digital system was to make information more easily accessible information. In a digital system information can be centralized in one place and searched efficiently without reference to and searches across various possible sources.

An essential factor external to the organization, which gave impetus to digitalization was the 1990 Gulf War (the invasion of Kuwait). During this time Bahrain was in danger and was exposed to any missiles. This was a factor external to the organization, which made it was necessary to keep the registration records and files in a safe place. "*The decision was made to transfer the files from Bahrain to London and keep them there until the end of the war. After this situation the importance of digital preservation of land registration information became to be taken seriously"* (Land Registration Advisor on 05-10-2017).

One factor transgressed external/internal categories of change when new staff was hired. In 2002 the Land Registration Directorate was joined by new educated staff, who had the ambition to develop the Land Registration Directorate, and the experienced employees supported them. The view of new staff was that digital work should be included in the registration process, to improve access to the land registration information and preservation from damage for any reason. At this time, the digital archive system was created, in which all files pertaining to land registration records are digitized and digitally stored. "*The beginning of the system was rather inflexible in that it started out as a simple digital copy of previous papers; and the system was not used well. However, it did help in facilitating the access to the information by means of individual of registration numbers, and allowed to visualization of information and the printing of documents"* (Technical Affair Director on 04-10-2017).

From here on digitalization was implemented step by step through mainly intra-organizational drivers. First, in 2003 to 2004, the transfer of maps from paper to digital took place to facilitate both the recording of information on maps and to make reading maps easier as described earlier. "*The process of scanning the paper maps started at a high level of accuracy and with high resolution, and these scanned maps have been linked with digital maps through GIS"* (Technical Affair Director on 04-10-2017). "*Everyone was impressed by this system, which facilitated and eased much of the work of land registration"* (Land Registration Advisor on 05-10-2017). "*In July 2005 this project was further operationalized in a digital environment to support recordation of the land transactions"* (Technical Affair Advisor on 09-10-2017).

Between 2009 and 2011 a new digital registration system was introduced to support revenue collection in the registration process. Previously, revenues were obtained through handwritten receipts, with copies to the Finance department and another copy in a transaction paper file. *"The digital system does not work in isolation, but it is a registration system that passes through most of the processes until registration is final at the moment of payment of the registration fees through this system. The system supports maintenance of property owner data, parcel details, and valuation, which are linked across the land registration sections. However, the system does not support all of the registration processes"* (IT Senior on 15-10-2017).

In 2013, another digital system was introduced, this one meant to transfer the manual system of writing deeds into digital format. "*This system supports templates for all registration transaction preparations and printing of digital deeds including owner name and parcel details. The printed deeds are saved in the system using registration number and owner detail*" (Deed Section Supervisor on 22-10-2017).

Overall, these incremental digitalization efforts of the land registration work at the Land Registration Directorate, which found impetus from both internal and external organizational environment, have increased efficiency and accessibility to land records. Previously it took a long time to find and construct one particular land transaction history based on analog documents, but now it only takes a few clicks to find out this information. These benefits are further described in the next section.

5.3. Benefits from digitalization: efficiency, convenience & legal certainty

This section describes three main benefits of the digitalization process in Land Registration Directorate. The first benefit for the Land Registration Directorate is efficiency gains. A second benefit pertains to the customers, for whole land registration has become more convenient. A third benefit is, for other organizations, in the form of increased access to the land registration information.

5.3.1. Intra-organizational efficiency gains

Using digital systems in the Land Registration Directorate helps improve employees productivity through the ability to easily access to the land registration information without having to contact another employee in another section and waiting for the paper file to arrive. Also, "*it is reducing errors related to manual work and errors in writing, as well as reducing the loss of documents and their save storage in digital form"* (Deed Section Supervisor on 22-10-2017).

Therefore, these digital systems have simplified the registration process. The process of information access and file transfer into the digital archive has become faster. This shortened many searches compared to the paper-based system and ordering the files. "*Previously the number of land registration transactions did not exceed 6000 transactions per year; it has now reached about 26000 transactions per year. That number of transactions required increases in performance and achievement, which had been too slow through paperwork and paper archives. However, with the introduction of the digital system for land registration transactions, all documents can be digitally retrieved and digitally recorded. This has accelerated the performance and achievement of land registration transactions"* (Registrars Supervisor on 18-10-2017). "*In the past one land registration transaction took more than 90 days, but because of different digital initiatives, this number has decreased in last seven years to less than 30 days of transaction time for the whole process"* (Technical Affair advisor on 09-10-2017).

The big thing that has changed by using those digital systems is the speed of access to the information. For example, if the customer wanted to register his property, the registrar should refer to the original archive registration paper file, to check it and match it with document submitted, as well as for the maps, check the paper maps and match them with the deed map provided, then complete the registration process. However, now, the situation has changed. Once the registration number has been entered into the digital system, all the information can be viewed digitally. "*That saves time and effort for the employees and the customers by having all the information in front of the employee in the computer through these digital systems. For example, in the past, if the customer comes to register his property and the original paper file is not obtained, the customer must wait until the original file is obtained. Then the registration process begins, and this process may have taken up to several days, but now all the files are stored digitally and easily accessible"* (Registrars supervisor on 18-10-2017).

One of the other changes also is the registration process for some sections. For example, when recording the registration numbers on paper maps and matching those maps with the maps submitted, each employee is assigned to specific area maps. If the employee who is responsible for the map was not present or could not be found, they looked for someone else to find the property required on the paper maps. Sometimes more than one employee was needed to find a particular parcel on those maps, and sometimes the job had to be postponed to the second day. *"The work took a long time to find one parcel in the paper maps and this affected the time of completion of the transaction. However, now all employee can do the same job in a few seconds with a few clicks using the digital system, through entering the parcel number or the registration number"* (Land Information Senior on 11-10-2017).

Also, in the past, land registration paper maps were updated whenever it is become so clattered, and there were more than one copy of each map. All paper maps were marked with registration numbers and court cases by hand using pencil and eraser. "*Imagine the time was taken and the total errors in these steps when reading or marking those maps, but now just enter the parcel number or registration number, and will have all the registration information*" (Technical Affairs Director on 04-10-2017). So, the most significant benefit is the speed of access to property registration information, which not benefited only the registration process but also in the case of property inquiries.

5.3.2. Convenience for customers

Customers are the eventual reason for making all of these changes in Land Registration Directorate in order to facilitate the registration of their property and the speed of completion of their ownership titles, which is intended for the benefit of customers. In the past, it was impossible to complete ownership deed in one day or in a week, where it took at least three months. "*The speed of completion of land registration transactions is explained by the presence and accessibility of information in digital systems that have helped to complete transactions in less time"* (Land Registration Advisor on 05-10-2017). The customers also confirm that they have benefited from the digital systems and have noticed that it has been an improvement in the registration procedure and in the performance for completing the transactions. *"Return to the history of such transaction they should refer to the paper files which is stored in the paper archive, which take a long time, and now its stored in computers which made the staff able to retrieve the information with the click of a button to extract all information"* (Customer no.2 on 16-01-2018)

Therefore, due to the use of digital systems in land registration procedures, waiting periods for completion of registration procedures have been reduced and benefited the customers. "*The biggest benefit was the reduction in waiting time to complete the land registration transaction from 90 days to less than 30 days"* (Registrars supervisor on 18-10-2017). Similarly, the customers said the biggest benefit of implementing digital systems in the registration process was by reducing the waiting times. "*We benefited the speed of completion of the transaction where previously it was more than one month and a half and perhaps more, but now the completion of ownership title deed faster and shrunk to a maximum of three weeks"* (Customer no.1 on 15-01-2018).

On the other hand, when some digital systems were introduced, the customer did not have to move much anymore with their paper registration file to complete the registration procedures. That is because some sections have been linked to each other to give reports through these digital systems without having to move the customer from one section to another and carry his paper file with him. "*Now the customer can submit all documents needed for the land registration reception desk. Then they give the customer a follow-up number after accepting the submitted documents. After that the customer waits in the waiting room until they are called to pay the fees, then the customer will have a receipt with the registration number and goes home until they are called via text message to come pick up their ownership deed"* (Land Information Senior on 11-10-2017).

Likewise, the Customers they have benefited from these digital systems and the digitally linked sections as they were moving from section to another in order to complete the registration procedures. "*Moving between the floors of the Land Registration Directorate building from one section to other in the past was annoying us, and a suitable solution has been found for this mobility through digital linking the sections related to the registration procedures in recent years, and that link has greatly facilitated us"* (Customer no.1 on 15-01-2018).

5.3.3. Gains in legal certainty of registration process: notaries access to information

Using the digital systems improved the legal certainty in land registration beyond the offices of the SLRB, especially in the beginning of the transfer of property process which starts with the notary section. The notary section does not belong to the SLRB, but it is under the Ministry of Justice.

Notary Office has a close association with the Land Registration Directorate. The notary office is responsible for documenting the ownership transfer contracts, and the owners are required to go to register their ownership in the Land Registration Directorate. The Land Registration Directorate accept only the contracts issued by the Notary Office and does not approve any other contracts.
However, the Notary Office needs to know the status of the property before issuing any contract, whether the property contains any court case or not to act on the property or any other conditions before the process of publishing any contract. *"The information required from the Land Registration Directorate is only whether there are restrictions on the property to prevent the disposal of real estate or not, and we do not need other information"* (Head of Notaries on 17-01-2018).

Previously the Notary Office faced many problems regarding access to land registration information and associated legal certainty. "*Previously the contracts between the dealers were documented without knowing whether the property had restrictions to act or not because of separation of Notary Office from SLRB*" (Land Registration Advisor on 05-10-2017). So that their property was not registered because of such restrictions which are known by Land Registration Directorate, but it is unknown to the notary section. Previously, when the Notary Office wants to make sure that the property is free from any restrictions, sends a paper letter with the customers to the Land Registration Directorate with the property registration number and title number which will be transferred to ensure that this property is free from any restrictions that could prevent its disposal. After that, the Land Registration Directorate stamping the letter and reply that there are no restrictions or there are restrictions on the property. *"In past, we were sending a paper letter with the customers to Land Registration Directorate to ensure if any restrictions could prevent the disposal"* (Head of Notaries on 17-01-2018).

According to the customers, there are many of those who do not have experience in the process of land registration from real estate's dealers in the past had problems because of the lack of communication between the Notary office and Land Registration Directorate. "*The sales contracts are documented between the buyer and seller, and the seller receives his money, and the buyer goes to the Land Registration Directorate to register his bought property, then discover that there are restrictions prevented the registration"* (Customer no.2 on 16-01-2018). Head of Notaries said, this is because such of court rulings are issued on a daily basis, and the Notaries rely on the response of the Land Registration Directorate to know if there are restrictions or not. Therefore, a court order may be issued against any property after inquiring about it. In this case, the response that receives is there is no restriction, whereas the Land Registration Directorate has received the judgment after inquiring about the property and has been blocked any disposal.

Therefore, "*the Notary section has been linked with the Land Registration Directorate through the land registration digital system according to their requirements only without giving them full access to land registration information like the visualizing the document."* (Land Information Senior on 11-10-2017). *"This system helped us, the Notary Office, to make sure that the properties to be transferred free of restrictions and gave more confidence to the notaries regarding the legality of issuing contracts and we do not need other information"* (Head of Notaries on 17-01-2018).

So, now before issuing any contract for property transfers, the notary refers to the digital system to check for any restrictions that might apply to property to decide whether the property can be transferred or not

before they are proceeding in the transfer process. *"We have benefited greatly from this linkage which helped the notaries in the process of documentation the contracts, and also help the customers regarding the preservation of their rights"* (Head of Notaries on 17-01-2018).

5.3.4. Summary

In summary, the benefits from the digitalization in Land Registration Directorate are described in three main benefits. First, the efficiency gained by improved employees productivity through the speed of access to information. The second benefit pertains to the customers through facilitating the registration of their property and the speed of completion of their ownership deeds. The third benefit is for other organizations, in the form of increased access to the land registration information. However, these benefits come through formalized and standardized the digitalization process which is described in the next section.

5.4. Organizational structure: digitalization through formalization and standardization

After having described the digitalization process in the Land Registration Directorate and its benefits, this section explains in more detail how the Land Registration Directorate uses standardization and formalization measures to implement the digitalization process. The standardization describes the technical measures of digitalization, and the formalization outlines the legal framework and policy of the digitalization process.

5.4.1. Technical standardization measures

The technological infrastructure of the Survey and Land Registration Bureau is excellent, and it is on the latest specifications. They have a secure internal network, and they have up-to-date servers with high information storage capacity, and as resources, they have excellent programmers and technicians. However, many of programmers and technicians are not employees in SLRB, but they are used by private IT companies. So, they are afraid of the loss of some of the developers and technicians because of the renewal of contracts with them. They also have concerns about renewing licenses for some software. *"SLRB is experiencing financial problems due to the current financial crisis in the region which affects the budget of our government, and thus may lose that power in the technological infrastructure currently we have"* (IT senior on 15-10-2017)

Also, all employees have computers, and each employee has his own machine; and they have a user and password to login to digital systems. Level and kind of access privileges and restrictions depending on the responsibility of each employee. There is also a system of protection for all devices and systems, so each point of connection to the computers are specific to a particular (IP) address assigned to each device connected to the network, which in turn does not accept any other (IP). Where for internal security there is a system called "virtual lane", which is where several sub-networks within the SLRB network domain are included. On each floor of the SLRB building there is a separate sub-networks. Within each sub-network, there is a particular server. So, within these sub-networks there is a privilege on accessing the systems, and that not everyone can access the servers, and not everyone can access the network of other floors. There is also another firewall security system for external protection for transactions with networks from outside the SLRB domain.

There is also another system to secure the website of SLRB, to protect information from penetration. So, that if there is a substantial traffic on the website a warning is given of the presence of congestion on access to information as this may be due to use by robots seeking access to the data on the site which is trying to access servers. Therefore, the website will disconnect to make sure there is no hacking and reconnected after a period. *"For that Survey and Land Registration Bureau has gotten ISO certification for information security. SLRB is proud that their information is secured"* (IT Senior on 15-10-2017).

Despite the relatively high level of digitalization in the SLRB and the synchronization of processes within each digital system, standardization is still in progress at the cross-system level. Although now in the Land Registration Directorate has a particular server for each digital sub-system, there is not one combined database for all of these digital systems. Initially, the digital archive system had its data and documents stored in a particular database. That system was created to replace the paper files stored in digital format. Then, land registration digital map system was created called the case file application; this system is used to replace paper maps to digital maps using GIS, where all registration transactions recorded on digital maps are now stored in particular database. Another registration system was also introduced, which is trying to automate registration procedures and to reduce the reliance on manual procedures. It includes the documentary cycle from the submission of the application until the fees collecting and printing payment receipt but do not include all other registration procedures. Another system has been developed to protect paper files from loss. It is called RFID (Radio Frequency Identification), which helps to trace paper files through sensors to ensure that these files are not lost and tracked. Also, recently two years ago a digital deed system was created which gives the authority to write and print the deed in digital format, which reduces waiting times and spelling errors that were done by handwriting and provide ready-made models for a set of transactions. "*All of these systems have shared data, but what is happening now is a repetition of data entry"* (IT Senior on 15-10-2017).

So, all those systems have their separate database, and there is no central database linking them. The reason for the multiplicity of digital systems dates back to the establishment of the Survey and Land Registration Bureau, where there was no IT Directorate in the beginning, but there were just some technicians who did not exceed five employees as support for those systems created at the beginning.

Therefore, whenever there is a need to implement a specific digital system in the Land Registration Directorate, a private IT company is employed to implement the system and train the employees to use it. On the other hand, when the company finishes implementing these systems, they must renew the licenses and maintenance with them, and it is difficult to develop these systems easily without calling the company that applied or work of this system. Work to consolidate the databases in now in progress. "*The aim is to have all necessary data entered from the beginning, and then the rest of the systems are fed through the initial input all the way through to the end of the transaction as such it would be full automation of the registration process and procedures"* (IT Senior on 15-10-2017). Digitalization across different sections of the SLRB has now reached a stage of maturity that enables to link these systems, because there is an excellent staff in the IT department, whether from programmers or technicians. "*The first stages of linking the systems have been completed and expected that the second phase would be completed soon by the end of the year 2017*" (IT Senior on 15-10-2017).

5.4.2. Policy and legal frameworks for the digitalization process

5.4.2.1. Digitalization Policy

According to the interviews with IT department, the establishment or development of a new digital system or the purchase of digital devices in the Land Registration Directorate is not a single decision by the Directorate. However, many procedures must be passed through, because of the new policy framework and the financial situation of the Government of the Kingdom of Bahrain regarding supply, development or purchase of devices related to technological development.

Therefore, when the development of projects or digital systems are proposed, these projects should be considered and approved by Ministry of Finance and through e-Government Authority. That because of the existence of a new policy in the Kingdom of Bahrain by the e-Government Authority. *"When any*

government department wants to buy equipment or develop a new system, e-Government Authority must approve all the projects related to the technological development of any government department, and these procedures have disabled some projects. If projects pass these requirements, further approval such as Tender Board procedures" (IT Senior on 15-10-2017).

Also, the new financial situation of the Government of Bahrain has reduced the budgets of most government departments by more than half in some cases, which has significantly affected the implementation of these strategic development projects and the transition to digital systems. "*Some of the budgets that were due to be used in the strategic plans have been transferred to contingency budgets, such as maintenance of equipment in case of interruption, renewal of software and application licenses, and other potential emergency issues"* (IT Senior on 15-10-2017).

5.4.2.2. Legal frameworks for moving to digital

The old land registration Law No. 15/1979 spoke decisively about the paper-based system through the logbook and did not mention anything about a digital system at all. Therefore, all registrations according to the law were required to be recorded in the big manual logbooks. After the Land Registration Directorate started using digital systems, it became necessary to have legal support for the existing digital systems. *"There have been many discussions to amend the land registration law with many advisors in the Land Registration Directorate, Legislation and Legal Opinion Commission and the Parliament, for including the introduction of digital and many other amendments. Therefore, discussions were held on the previous work system, experience and level of qualification of staff at the Land Registration Directorate. Then it was concluded that the digital system must be included with the paper system at one time"* (Registrars Supervisor on 18-10-2017).

So, the last land registration law no. 13/2013 was found to support the digital systems used for the land registration transaction in the Land Registration Directorate and give it legal support so that there is no legal argument over of existing digital system. "*In the old land registration law of 1979, there is a definition for land registration archive, which defined as a paper archive. It describes the property, legal status, owner name, rights, transactions history and amendments related to it. Then in the modifications of land registration law issued in 2013, it is mentioned that each property should be included in the land registration archive on paper as well as digitally*" (Legal Advisor on 10-10-2017). After the 2013 law, there will be no conflict or legal dispute when moving to digital. At the same time, the paper-based system is still in place. "*This is to allow Land Registration Directorate to transfer all the transactions in digital format, except for official signatures required for official papers such as title and others, because there is no law currently authorizing the digital signature on official documents"* (Legal Advisor on 10-10-2017).

The reason is that digital versions of documents must conform to original documents that carry signatures and official seals. Otherwise, the transaction cannot proceed. The original of each digital document must, therefore, be evidenced on paper while the remaining procedural steps can be carried out in digital form. In other words, the law at present requires matching digital documents with officially signed and sealed paper documents in the first instance. "*If we had an order from the executive court to stop the disposal of the property of a particular person and this order is received in a digital format only, it cannot act on, until we receive the original signed and stamped paper by the judge*" (Legal Advisor on 10-10-2017).

However, some employees believe that there is a slow pace of legislating or amending the land registration laws, as the land registration law has not changed for 34 years. *"There are no initiatives to revise and update the land registration law to keep pace with good practices around the world. There is also a lack of awareness of the importance of legal support for digital system implementation and use by the management of Land Registration Directorate"* (Juniors staff on 24-10-2017). Furthermore, there is a lack of confidence in the digital system, because of fears that the

digital system may fail at any moment which in turn will stop the work. This is due to the age of employees and their mentality, which used to work with paper system throughout those years. These issues will be presented in more detail in the following sections.

5.5. Organizational sources of resistance to change

One characteristic of the digitalization process in the Land Registration Directorate is that it has no vision or plan to move to digital data storage and workflows and change the way the organization works accordingly. However, it responded to external and internal forces such as the Gulf War and the needs to apply new methods and replace the paper-based system to a digital system to try to keep up with international practices in the preservation of land registration information. So, the Land Registration Directorate perceived various advantages of digitalization. However, there are also disadvantages, especially if these transitions take on a slightly unplanned character and give too little attention to organizational aspects required for system and workflow changes. Therefore, the Land Registration Directorate faces various forms of resistance and difficulties in convincing staff to accept the changes in the organization. This section explores sources of resistance in more detail in the organizational sources of resistance.

5.5.1. Digital data sharing practices

One source of resistance is indirect because it is embedded and derives from current data sharing practices in the digital environment. This hampers full integration and access to all data. First, sharing of information is limited, because of the sensitivity and political nature of land registration information. Second, there is also a sort of tendency to try to monopolize on data holdings by some staff.

5.5.1.1. Use context to account for sensitivity and political nature of land registration information

Sharing of information between Land Registration Directorate sections and other directorates limited to the requirements of each section or directorate. Hence, complete and open sharing of sharing information between any person or section is not allowed, because of the sensitivity of land registration information. For example within the SLRB, in some cases, the employee needs to know whether the property is registered as a building or empty land and then only this information is given to him to check the validity of this request only. Another example relates to data sharing with external agents. The notary office, which is not under SLRB but under Ministry of Justice, needs to know the state of the property regarding pending court rulings to be able to decide, whether it can take a specific action on the property in question or not. The same applies to information related to other urban planning conditions that need to be met before issuance of any contract. It is only the required information, which is provided to the notary by the SLRB. *"Information sharing depends on the needs of each section or directorate to the extent that this is important to the use of the respective section without requiring any additional information"* (Land Information Senior on 11-10-2017).

The coordination between Land Registration Directorate with Survey Directorate is excellent. Whenever the digital map system is updated the cadastral data is shared between the two directorates, including information like cadastral parcels, and Land Registration Directorate have access to Survey Directorate database and generating every twice a week the whole cadastral database. *"There is coordination between the Land Registration Directorate and other ministries such as the Urban Planning Department and the Central Information Organization (CIO) to obtain land use data and property addresses, where the Land Registration Directorate can obtain such information"* (Technical Affairs Advisor on 04-10-2017).

In another hand, whenever those directorates or ministries ask for data sharing with Land Registration Directorate they refuse to share. Therefore, the link between the other directorates which benefiting from

the land registration information such as Survey Directorate and other ministries are not possible to share in a digital way, and they are not given the right to access to land registration information. "*However, they were given only what they need, no more, no less, and limited. That is due to the political dimensions of this information"* (Land Information Senior on 11-10-2017).

5.5.1.2. Tendency to monopolization on data

In the paper system, some employees exploited some information in order to gain a dominant position in the overall information scene. Such information is a source of strength for these employees if they are the sole reference. This also applies for each of the sections in the organization, where each has its own information in books and does not need to or want to share these across sections. This tendency to retain information by section has been transferred from the analog system of record keeping in books to the digital systems, where each section now has its own server. "*The data on these servers is not shared between sections"* (Junior staff on 24-10-2017).

As an example, a customer service system has been established, and those with high educational qualification are leading this system for developing. The purpose of that system is to provide services to customers by giving query services, tracking the status of transactions, and sending text messages if the transaction is completed, as well as providing reports for the performance of each section in completing the transactions. However, this system found no acceptance among the registration staff, who do not give information from their respective sections of the organization. "*The reason for this is the tendency of some staff to retain a sort of monopoly over the information, especially in the sections currently working with the paper system"* (Land Registration Advisor on 05-10-2017).

5.5.2. Generational gap in staff

One of the most significant reasons for resistance in Land Registration Directorate derives from the generational gap in staff. This section describes the nature of this generation gap between the staff regarding skills and attitudes, experience and knowledge, and the overlap of this gap with the organizational hierarchy of communication.

5.5.2.1. Skills and attitudes

All employees in the Land Registration Directorate have access to computers, and each employee has their own machine. Also, they have a user and password for using the computers and digital systems, and all employees have private e-mail within the SLRB domain.

In term of skills there are two generations of staff in the Land Registration Directorate. The old generation who relies on paper and does not have the experience in using the computer and the existing digital systems, but they have experience in land registration processes. "*Recently a new generation has become employed who have university degrees in legal disciplines, and they have the knowledge of digital technologies, but do not have much experience in the land registration domain"* (Land Registration Advisor on 11-10-2017).

The problem concerning digitalization of data archives and work processes now is that Land Registration Directorate cannot dispense with the old generation, who has the experience in land registration. However, that old generation does not have the skills to do digital work, and vice versa for a new generation who know digital, but they do not have the experience in land registration.

The old generation of the experienced staff do use the digital software, but in a simple way, for example, to view and print data and documents, because the information is retrieved faster by digital means, but and

many of them are still requesting original paper files and depend on them. Their education is a general secondary school degree. "*There are some of the old generation do not know how to use computers, and sometimes do not even remember their username and password to open their computer"* (Deed Section Supervisor on 22-10-2017).

The new generation uses these digital systems more extensively. They also use other digital software such as e-mail and Microsoft products, and the Internet more broadly. They try to integrate these digital applications into their work and prefer using digital software over the paper. Sometimes they complain about paperwork and explain, that we can work better through existing digital programs instead of paper. "*The performance of the new generation by using digital systems is faster than of those, who use paperwork"* (Junior staff on 24-10-2017).

5.5.2.2. Experience and knowledge

The generational gap is not only one of the skills, but it overlaps with age. There is a big difference in the age of staff in Land Registration Directorate, which is up to 20 years between the new generation and the old generation, This is because there was no employment for 20 years in Land Registration Directorate. During this whole time only, few people worked at the Directorate. Now there is a big difference in existing experiences in the Land Registration Directorate, and the majority of experienced people working at the Directorate now are from the old generation, which reaches the age of 55 to 60 years. According to junior staff, "*these people constitute a significant obstacle to the development and transition to digital systems and to abandon the paper system in land registration processes"* (Junior staff on 24-10-2017).

There are many elder employees of the old generation do not deal with the digital systems, and their ideas in development are simple, which relate to the organizing the issues through the paper. Also, when they are discussed in what can be done with the computer, they wonder and do not believe in it, and reject the idea of working without paper. The older generation who worked at the beginning in Land Registration Directorate did not have higher degrees but held high school degrees.

However, now Land Registration Directorate has a new generation with higher degrees such as bachelor's and master's degrees. They are young and ambitious generation who wants to develop the land registration procedures and transition to digital work and to abandon paperwork. However, the new generation they are willing to have digital systems because they say if they can do everything in their mobile why they cannot do it for land registration.

However, the difference is also not educational qualifications, but practical experience in land registration, and as mentioned earlier there is experience with the older generation more than forty years, but the new generation does not have that experience but has access to knowledge through university study. Therefore, "*the Land Registration Directorate cannot dispense with the experienced staff of the old generation, and also needs the holders of higher degrees of the new generation, and the integration of long experience with educational knowledge is necessary"* (Land Registration Advisor on 05-10-2017).

The problem is that this new generation has learned from the old generation, which has been in line with the paper system. "*There may be a transfer to the thought of the old generation of the need for written and tangible paper document"* (Land Information Senior on 11-10-2017). However, now with the passage of time and dealing with the new generation there is a difference in the perception of digital systems, they began to see the difference in the speed of performance, and gradually the use of that digital systems will be a reality.

According to Technical Affair Advisor, *"when the elder staff sees the younger staff are doing the thing faster than them, they also ask to have this digital system"* (Technical Affairs Advisor on 09-10-2017).

However, many employees of the old generation will retire soon in the next three to five years, according to the law of the Civil Service Bureau and the arrival of the retirement age. Unfortunately, there is no second-row staff as a substitute for the staff who will retire soon, but there are some attempts but not as ambitious as required. So, some attempts have been made to prepare a second-row but have often failed, due to a conflict between the two generations through clashing with ideas and experiences. According to Registrar Supervisor "*some experienced people are trying to transfer their experience to the new generation and educate them, as well as the new generation is trying to acquire that experience and trying to develop, but this effort has failed"* (Registrars Supervisor on 18-10-2017).

So, the generation gap between the elder and younger staff in experience and knowledge within Land Registration Directorate is one of the major barriers in digitalization process. "*All this constitutes a major barrier between the two generations in imparting knowledge and trust among them"* (Land Registration Advisor on 05-10-2017).

5.5.2.3. Overlaps with communication hierarchy

There is a communication hierarchy in the management of Land Registration Directorate to move forward to digital work. "*The guidance comes from the higher level of management to develop some procedures and create a digital system which benefits a particular section or to speed up a specific process"* (Land Information Senior on 11-10-2017). These guidelines are usually coming from top management, which consists of members of the old generation, who are, however open-minded with respect to using digital systems. On the other hand, many of the managers and supervisors, who are in the middle management of the organization, want to maintain the paper system and refuse the move to digital. "*Many of the old generation are managers or heads of sections in the middle management even though they do not hold higher education degrees, e.g. from university and colleges, but because they have work experience that qualified them to obtain managerial positions"* (Deed Section Supervisor on 22-10-2017). "*The employees from the new generation, many of whom hold higher education degrees, want to move forward to digital work are in the lower rank of management, and they are from the new generation, often clash in their attitude with the middle management"* (Juniors staff on 24-10-2017).

There are essentially two sources of conflict embedded in this current hierarchical/generational structure. On the one hand, when top management wants to implement a new digital system it finds resistance from middle management in sections, that either not accept the transition to digital work or refuse the implement of the system. On the other hand, the new generation employees try to apply digital initiatives in a more "bottom-up" fashion, but these efforts are also hampered by their managers or supervisors, who want to maintain the paper system. This situation renders the strategy of consultation across organizational hierarchies to improve system implementation unfeasible. Instead, "*most of the transition to digital work in the Land Registration Directorate is ordered by top management without consulting the heads of sections, who are known to wish to maintain the paper system"* (Juniors staff on 24-10-2017).

So, most digital systems are implemented in a top-down fashion through directives from higher level management and without consultation of middle and lower management with the idea that sections then must comply without consideration of lower and middle management views. Therefore, when trying to implement these digital systems, the efforts either fail or become rejected due to resistance by staff.

5.6. Reasons for resistant: perceived paper benefits and digital threats

After having described sources of resistance embedded in the organizational structure, history, culture, and practices above, the following sections will describe the reasons for the resistance to the digitalization process in Land Registration Directorate in more details. The views of those, who resist, have three main explanations. First, they see the values of maintaining the paper system for reference and validity. Second, they perceive technical advantages of using the paper and perceive risks of digital failures. Thirdly, they perceive the transition to digital as a threat to their discretionary powers, job security, and health.

5.6.1. The value of paper validity reference and safety back-up

The main reason for having a dual system of paper and digital records in the Land Registration Directorate is the need to have the official documents signed manually, and to keep these documents as an original point of reference in the land registration archive. Very briefly the process for a sales transaction is therefore as follows. The notary office documents the origin of a sales contract and signs it. The customers need to bring the original document to proceed with further transactions to complete the registration of sale. When the transaction is complete, the original signed document is stored in the transaction file and archive. In comparison, in digital work what is stored is only a scan of the original signed document, and because this is a copy it is no longer considered original official document (despite it being a scan).

Similarly, according to the land registration law of 2013 customers are required to bring all the original documents pertaining to the required transaction, including documents such as the contract of sale, the origin of the mortgage contract and the origin of personal information in order to process the land registration. "*Once these documents have been scanned its considered as digital copies of the original and cannot be accepted later as official documents"* (Legal Advisor on 10-10-2017).

These requirements reflect the value paper (still) holds as a point of reference that backs up digital information with a non-digital source of historical validity.

"Land registration entails transactions that impact a diversity of actors and their relations, including real estate clients investors, businessmen, members of the royal family, citizens as well as foreign owners and investors. Therefore, we cannot rely on only one system, so that if any disruption of the digital system, the paper system still exists and can be worked without any problems" (Legal Advisor on 10-10-2017). In this case, the value of the existing paper system lies in its role as a back-up to digital systems, which may fail or get disrupted, to ensure that transaction validity in the land registration domain is retained.

5.6.2. Technical advantages of using paper

There are also some technical advantages to using paper, although comparatively small. They are mainly related to problems in transitioning to digital work.

The new ownership titles are printed from the new digital system. The quality of title document has changed since the introduction of this digital system. The reason is that when printing sometimes the title papers got stuck and damaged, because of the printer. This in turn delays the completion of the transaction, subtracting again from the efficiency gains through digital work described earlier If the title paper is damaged during printing, a new title must be requested from the central printing press, which takes time. The old title documents written by hand are comparatively of higher quality compared to the printed versions and do not deteriorate quickly over time. There are still some titles that are over 60 years old, but still in good condition and not much affected time.

Also, when the ownership title printed, it cannot be modified in the event of an error in the texts, whether by editing or scratching. "*According to the law, such a modification of the printed title would cancel the title. In comparison, the previous handwritten titles were easy to modify without damaging or devaluing it"* (Deed Section Supervisor on 22-10-2017). Some of these technical difficulties related to working with both digital and paper-based media also explain resistance to the transition from analog to digital systems.

5.6.3. Digital threats: loss of discretionary powers and health concerns

A few employees in Land Registration Directorate resist moving to digital systems especially because they perceive their authority and job security being reduced. They think that what they are doing today their colleague will do the same thing and with the same efficiency they are doing. Because in the digital system everybody at the same level has the same privileges in accessing information, the paper environment allows comparatively more space to some employees to hoard data or documents and play the role of gatekeeper in this way. Also, in the digital environment, tracking the performance of employees can be more efficiently, for instance regarding the number of transactions having been completed per day and it is not possible to choose the number of transactions at the beginning of the day, which is distributed equally among all. "*In the beginning, everyone resisted this kind of performance tracking, but now it is starting to find acceptance"* (Technical Affairs Advisor on 04-10-2017).

While the above insecurities relate to the potential loss of jobs and the loss of power that derives from having control over information and own work processes in the paper-based system, another insecurity relates to the loss of status. The Land Registration Directorate has tried to increase staff awareness and training on the use of digital systems and to teach staff in specialized institutes, especially those who refuse to move to digital work and who are older. Despite these attempts, some staff oppose the idea of training or attending such courses. "*When they discuss the reasons for their refusal, they point out that as senior employees they do not wish to study with young students as this is embarrassing for them. Therefore, another idea to train older, experienced staff was to contract with one of the institutes and to train them in their workplace. Some agreed to this, while others refused. The latter voiced objections, because their "aged minds" would not be able to study"* (Land Registration Advisor on 05-10-2017).

"Some employees have a fear of change to move from the paper system to the digital system, possibly caused by not knowing the results of this change or the things that will result from this change" (Land Information Senior on 11-10-2017). That depends on the personality of the employee who would make use of the digital system. "*The old generation depends on pen and paper, and this type of staff believes that any system other than pen and paper will be complicated and therefore unacceptable, especially as they do not have the most straightforward skills in the use of a computer"* (IT senior on 15-10-2017)

Furthermore, some of the older staff reject using computers, because they fear that it would negatively affect their health, especially their eyesight through working on a computer screen for a long time. One of the reasons for the rejection was also from the elder staff who refused the transition to digital work. They were from the old generation who had the old mind that using these digital systems would affect their health. "*They feared that the transition to digital work would weaken their eyes through working for a long time on the computer screen"* (Technical Affairs Director on 04-10-2017).

5.7. Status of current formal organizational means to address resistance

Against the background of various sources of and reasons for resistance, the following section describes how the Land Registration Directorate deals with the opposition to the digitalization process. The section

will describe the lack of a plan for knowledge transfer in experience gained, failure to implement the strategic plan for the digitalization process, weakness in consultation and participation of staff in implementing digitalization.

5.7.1. Plans for knowledge transfer

There is a significant lack in the Land Registration Directorate to expand experience gained and access to knowledge that can be shared between the older generation, who have long experience gained in land registration and management experience, and the new generation, who has learned through graduate studies and learn from the international practices. As described above this generational gap forms a significant impediment to organizational change. Therefore, the Land Registration Directorate cannot rely only on the expert staff form the old generation, but also need to incorporate new competencies that bring different views obtained through higher education studies and knowledge of International practices into the organization. At the same time, the practice-based experience of the older generation needs to be transferred to the younger staff.

Such two-directional transfer of knowledge would enable the interconnection of experiences and access to solutions and innovation to foster successful change in the organization. However, in the Land Registration Directorate, there is no such correlation, according to the Land Information Senior and the Junior staff.
"Still there are some those who do not or not convinced of the transfer of full knowledge, because of the monopoly of that experience for themselves to be the source of knowledge and reference" (Land Information Senior on 11-10-2017).
"When the knowledge transferred from old generation to the new generation it is not sufficiently transmitted, and part of it deleted until it discovered, so to return to them again to show their strength in experience, and they are the source for that experience" (Junior staff on 24-10-2017).

Therefore, the absence of a plan for knowledge transfer to prepare a second-row to take over the positions of the old generation in the Land Registration Directorate leads to unplanned circumstances, especially since there are many experts will leave the Land Registration Directorate and retired soon. Therefore, when those experts with practical experience retire without gaining their experience and transferring it to the new generation, this will lead to the loss of accumulated knowledge that will disappear when they leave the Land Registration Directorate, and that experience may reach more than 40 years.

5.7.2. Plans for digitalization, including budgeting

In 2013, Survey and Land Registration Bureau signed a cooperation agreement with the Ordnance Survey International, the National Mapping Authority of Great Britain, to develop a five-year strategic plan. The cooperation agreement output was a new strategic plan of development to assist the SLRB work through future strategic projects. The plan contained several projects for Land Registration Directorate that should be implemented to move to the digital environment. These projects were excellent, but they were on paper only and were not taken by the Land Registration Directorate on the reality and was not on a timeline plan to accomplish. Among those projects that have been booked funds for it was upgraded technology, electronic workflow, electronic title deed, electronic submission, and electronic conveyance.

However, the new financial position of the Bahrain government has shrunk budgets for all government departments to more than half in some cases significantly affected the implementation of those strategic projects set in the prepared plan. *"There is some budget that was planned to be for the strategic projects go to another emergency, such as maintenance of equipment in the event of disruptions, and renewal of licenses for software and applications, and so on from emergency matters"* (IT Senior on 15-10-2017).

Currently, there are no existent strategies for the digitalization in Land Registration Directorate. According to the IT senior, the digitalization process comes through the required by each section, and that describes there is no comprehensive system for all land registration procedures. *"There are separate digital systems for each section, each system in each section developed according to the section needs"* (IT Senior on 15-10-2017).
However, there is no clear plan. "*We do not see anything written to be applied or worked on, but what we know is that the goal of all of this transition to digital is the customer satisfaction and speed up the land registration procedures"* (Deed Section Supervisor on 24-10-2017).

5.7.3. Consultation and participation

In some cases, there is an involvement of staff in decisions being made about organizational changes related to digitalization to give staff the opportunity to share and apply their ideas about the transition to digital. This cannot be considered a full involvement as it only includes few staff selected by top management and consultation pertains to the establishment of appropriate procedures only. Therefore, the opportunities for staff to express their opinions are few. Instead, those who are consulted will then have the responsibility of transferring the ideas for a new digital system to the remaining staff, observe and collect staff's reactions and comments, which can be then be conveyed to the top management. However, cannot guarantee that employees in the lower rank of management, and they are from the new generation, can participate and brainstorm or not. Because they have not been given the opportunity to participate. *"The consulted employees are usually section heads or managers who are in middle management"* (Registrars Supervisor on 18-10-2017).

So, most digital systems are ideas from top management, and the sections must apply them without consulting the section staff or inquiry into the staff's their ideas. Therefore, there are problems when applying these systems, and they may fail due to rejection by employees. Because programmers are brought to learn the procedures or the workflow of the land registration in a paper-based system and turn it into digital systems but without full knowledge of land registration procedures its requirement. *"When the staff member is consulted and involved in the planning for this digital transition, the transition will be more efficient and successful, and the employees will feel that they are part of this transition"* (Deed Section Supervisor on 22-10-2017).

5.8. Summary of findings and analysis

Figure (4) below summarizes the finding described so far and it is in reflection to the conceptual framework presented in sub-section 2.8. It shows the organizational change that occurred during digitalization in different stages. The benefits for Land Registration Directorate from the digitalization are described as efficiency gains, convenient for customers, and legal certainty through notaries' access to information. Formalization and standardization support the process of digitalization. However, the attitudes towards the digitalization in Land Registration Directorate influence the process negatively through the source and reasons for resistance. Also, the formal change management style of Land Registration Directorate does not address the resistance in a proper way which did not drive the process to the full success.

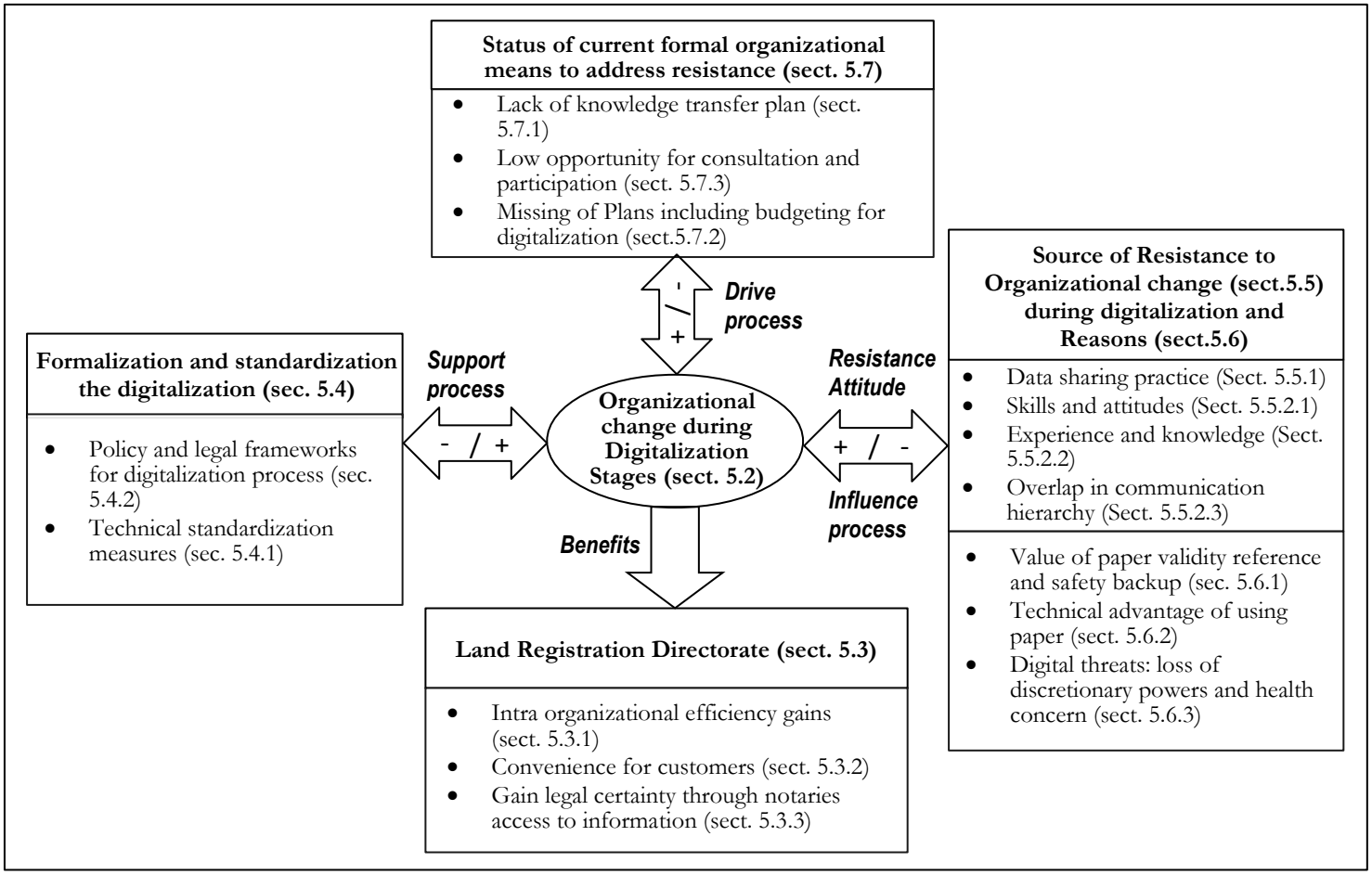

Figure 4 Findings about the Land Registration Directorate with in reflection to the conceptual framework

Overall, it can be noted that the digitalization process in the Land Registration Directorate of the SLRB has not been strategically planned, but instead takes place in response to both external and internal forces and needs in a relatively ad hoc manner. One of the main sources of resistance to digitalization and associated organizational change lies in various factors related to the generational gap. The gap manifests regarding types of experience, skills, and attitudes towards digitalization, but also interlinks with organizational hierarchies. The Land Registration Directorate still does not have a broad vision to guide the transition from paper to digital, and with the new financial position of the government the digitalization process has become further complicated and slowed down. So, based on the more detailed findings, four main themes are cross-cutting and form the points of discussion in the next chapter, namely:

- The un-strategically planned character of digitalization
- The generational gap between the staff
- The skills and attitude of the staff towards the digitalization
- Missing of broad visioning for digitalization

6. DISCUSSIONS

6.1. Introduction

This chapter is highlighting the essential crosscutting findings from different sections of findings analysis in chapter 5, and those are discussed in comparison with the literature. Firstly, the character of the digitalization process is not planned but is responsive to the external and internal need forces. Secondly, the skills and attitudes are the main problems deriving from a generational gap. Thirdly, the chapter will look closer at attitudes and source of resistance. Lastly, the lack of broad vision or guideline to move from paper to digital, especially with the new financial position for the government, is discussed

6.2. Character of digitalization

According to Jacobs, Witteloostuijn, Christe-Zeyse (2013), in their study "Theoretical Framework of Organizational Change" that developing profound insights into the organization's environment for the future is needed by adapting to its external environment through analyzing the opportunities and threats surrounding. In addition, to its current internal environment through analyzing the strengths and weaknesses that would influence the organizational change. In the organizational change case of Land Registration Directorate for the transition from paper-based system to the digital system did not follow a specific long-term plan based on the study or analysis of the status of the organization, regarding strength, weaknesses, opportunities, and threats of the change. This has been demonstrated through the digitalization stages which take place more or less spontaneously according to the external forces and the internal needs of the organization (section 5.2).

Luna-Reyes & Gil-Garcia (2014), in their study "Digital Government Transformation and Internet Portals" found that the external influencing factor of change are customer expectations, improvement in quality and standards, government legislation and political values that affect changes in the economy. While in the case of Land Registration Directorate, the external drive for the change was also the Gulf War (the invasion of Kuwait), that gave impetus to digitalization for keeping the land record in digital form. In addition, the internal drive for the case of Land Registration Directorate was how to deal with massive amount of papers and convert them to digital, the amount of wrong information in the paper-based system, and the new educated staff who had the ambition to bring the digital work (section 5.2). While according to Jacobs, Witteloostuijn, Christe-Zeyse (2013) in their study that internal analysis should include the organizational assets, capabilities, competencies, and resources which results in employee's behavior, organizational culture, mission statement, and the leadership style that would affect the change.

Therefore, Land Registration Directorate faced difficulties and resistance because of the change to digital, which results in a slow digitalization process.

6.3. Generational gap

According to doing business report of the World Bank (2016), the human factors are critical in the digitalization process in every organization and attention should be given to developing their capabilities and skills. So, the skilled human resources in the land administration organization to keep the digitalization systems performing effectively and efficiently. In the case of Land Registration Directorate, it suffers from a significant gap between the older and younger generation staff in skills and behaviors towards the digital transition, making digitalization a complicated process (section 5.5.2). Therefore, the Land Registration

Directorate found itself in conflicts between opinions and attitudes from the two generation, which elder reject the digital and the young are support the digital.

Alshehri and Drew (2010), in their study Implementation of e-Government: Advantages and Challenges, found that the culture factor plays a vital role in the digitalization process. Because many organizations are facing resistance during the process of digitalization due to that employees who are working in the traditional paper-based system and see the change as a threat their jobs and power when changing to a digital system. While in the case of Land Registration Directorate, due to the gap between the two generations affected the land registration law amendments in 2013 (section5.4.2.2). Which was supposed to help the transition to digital, but came to cope with this gap between the two generations and requires the Land Registration Directorate of using both paper-based and digital system at the same time. Because the new generation is trying to involve the digital system to the land registration and the elder generation are trying to maintain the paper-based system.

6.4. Attitudes and sources of resistance

Bishop and others (2000) in their study "Spatial Data Infrastructures for Cities in Developing Countries" argue that access to land information on paper-based systems is complicated or could be impossible, and lead to aggravating the problem of sharing information efficiently. While in the case of Land Registration Directorate shows that even in digital environment access to land registration information is restricted and unshared or sharing is limited (section 5.5.1). However, that case is opposite to the opinion of Enemark (2001) in his study "Land Administration Infrastructures For Sustainable Development" on sharing geo-referenced information in a land administration. Because using the spatial data infrastructures in a digital environment enable all participants to collaborate with each other and interact using one central digital network, to achieve their objectives at different organization levels better. Whereas in the case of Land Registration Directorate there are separate databases for each section within the Directorate which are not integrated with one another, but are nevertheless used for the same function of land registration. These separate database have common data being entered. So, there is much duplication in entering data, which leads to more time and resources being spent (section 5.4.1). Rajabifard and Williamson (2001) in their study "Spatial Data Infrastructures: concept, SDI Hierarchy, and Future Directions" that the data-sharing allow the users to save resources, time and effort regarding acquiring new datasets and avoiding the duplication in obtaining and maintaining the datasets and enable the integration with other datasets. However, the case of Land Registration Directorate shows that, despite potential efficiency gains (section 5.3), there are some reasons for not sharing or limited sharing of data, namely: sensitivity of data and the political nature of land registration information (section5.5.1.1), as well as tendency to monopolize on data on part of some staff (section 5.5.1.2.). So, Land Registration Directorate faces resistance at the organizational level for moving to the digital environment.

Folger and Skarlicki (1999) in their study, "Resistance to Organizational Change," argue that resistance to organizational change occurs when employees' behavior seeks to challenge or disrupt the current power relations that exists in the organization. In the case of Land Registration Directorate, the resistance at the organizational level, however, derives also partially from the technical advantages of the using the paper-based system, which are in turn linked to the fears of failure of the digital system, potentially leading to disruptions of work (section 5.6.2).

According to Oreg (2006) in his study "Personality, Context, and Resistance to Organizational Change" resistance to change is a negative attitude towards change, which includes behavioral, and mentality of

employees in the organization. In the case of the Land Registration Directorate resistance to change is not explicitly a negative behaviour or mentality, but it derives rather from valuing the paper-based system for different reason, e.g. in that it ensures the existence of a reference to land registration documents through the paper archive as evidence and preserved in its original form (section 5.6.1).

Boohene and Williams (2012) in their study, argue that even if the execution of organizational change for positive reasons, employees often react negatively toward the change and resist the change effort. Also, according to Armenakis and Bedeian (1999), one of the main reasons behind the negative attitude during organizational change due to pressure, tension, and doubt of employees about the job security. This is similar in the case of Land Registration Directorate, where individuals or groups resist changes due to personal concerns about the digitalization process, including a loss of power and health. (section 5.6.3).

6.5. Vision or guiding framework

According to the "doing business report" of the World Bank (2016), before moving towards in digitalization process, several considerations that must be taken into account include legal framework, technological capabilities, human, social and organizational factors. Whereas in the case of Land Registration Directorate there were no vision or guiding framework for the digitalization process. Therefore, it is noted that there is a semi-chaos in the transition to the digital process, where digital systems developed are imposed by various forces on the Land Registration Directorate. Whenever there is a need to create a digital system, the Land Registration Directorate will apply it without considering the skills or capabilities of those who will use the new digital system (section5.2). Therefore, these new digital systems either fail or do not continue, because of the resistance and lack of awareness of their importance (section 5.6), because there is not much consultation involving those who will use the new system (section5.73), and because there is a lack of skills sufficient for those who are supposed to apply the system (section5.5.2.1).

Radzi (2016) in his study, "Resistance to Change: The Moderating Effects of Leader-Member Exchange and Role Breadth Self-Efficacy" found that the resistance to organizational change can reduce if the organizations control the flow of information, create room for workers participation and grow trust in the management of organization functions. While the management of Land Registration Directorate for the change to digital was from top-to-down, which by ordered to implement the digital systems without consultation or participation of those who would use these new systems (section 5.7.3). Therefore, the Land Registration Directorate found itself in clashes with its employees regarding their refusal or resistance the digitalization process.

On the other hand, according to the "doing business report" of the World Bank (2016), that unclear legal framework can serve as a weakness to the execution of digitalization because of outdated legislation or lack of legal support for the digitalization. While in the case of Land Registration Directorate, the land registration law amendments in 2013 was supposed to help the transition to digital, but it requires of using both paper-based and digital system at the same time. Also, the land registration law does not accept the digital signature and request to archive the land registration original paper documents (section5.4.2.2).

In addition, the current financial situation of the Government of the Kingdom of Bahrain does not allow for the existence of those ad-hoc transitions to digital. Where there is now a fiscal policy that has reduced budgets and affected the projects for the transition to digital, and there is a policy for the use of technology in government departments (section 5.4.2.1). Therefore, the existence of a broad vision or guidance framework for Land Registration Directorate is necessary regarding the digitalization process in the form of

projects with needed budgets and feasible timelines to help in the transition to digital. One of the limitations of this research is that these financial issues could not be studied more in terms of their influences on the digitalization process.

6.6. Summary

The discussion in this chapter is based on the main concern identified from findings analysis chapter 5 in comparison with the literature. The digitalization process in the Land Registration Directorate of the SLRB can be characterized as relatively ad-hoc in nature. It has not been strategically planned, but instead takes place in response to both external and internal drivers and needs. Also, one of the main sources of resistance to digitalization and associated organizational change lies in the various factors arising from a generational gap. Additionally, the gap manifests regarding types of experience, skills, and attitudes towards digitalization, but also interlinks with organizational hierarchies. Furthermore, employees value the paper-based system for various reasons, which also forms a source of resistance to change to a digital system. Finally, the Land Registration Directorate does not have a broad vision to guide the transition from paper to digital, and with the new financial position of the government of Bahrain the digitalization process has become further complicated and slowed down due to these financial constraints.

7. CONCLUSIONS AND RECOMMENDATIONS

7.1. Introduction

This chapter concludes the findings of the research, and it presents that the objectives have been achieved based on the results. This was done, through the thematic analysis approach on the organizational change during the digitalization in case of Land Registration Directorate of Bahrain, which is applied in the analysis finding chapter five. The critical finding analysis and discussions are elaborated in chapter six. Those discussions provide a basis for the recommendation in this chapter.

7.2. Conclusions

The main objective of this research is to find out the nature of organizational change during digitalization in the Land Registration Directorate of the Survey and Land Registration Bureau in Bahrain. In order to achieve the main objective, the conceptual framework is created based on the literature review. A qualitative research method is used through semi-structured interviews. Then, the analysis are done based on the conceptual framework and as indicated in the research questions. After that, the findings from the analysis are fine-tuned with the conceptual framework. So, the main findings are identified and discussed. The main objective of the research is achieved through specific objectives as they are investigated as follows:

7.2.1. Objective one: *To describe the digitalization process in Land Registration Directorate in Bahrain*

Digitalization process in Land Registration Directorate is described according to the stages and the internal and external drivers (section 5.2). That changes in term of digitalization have been beneficial for the Land Registration Directorate in gained efficiency by improving employees' productivity through the speed of access to information. Also, convenience to the customers through facilitating the registration of their property, and for other organizations, in the form of increased access to the land registration information as notaries (section 5.3). However, moving to fully digital has not been achieved yet in Land Registration Directorate and still the land registration procedures are going on with both systems of paper-based and digital working in parallel. There is no direct findings analysis for that, but it is a combined with findings of next objectives section.

7.2.2. Objective two: *To explore the digitalization process in terms of organizational structure and attitudes in the Land Registration Directorate in Bahrain.*

Land Registration Directorate adapted two main measures to support the digitalization process in term of standardization and formalization of the change process (section 5.4). The standardization describes the technical measures of digitalization (section 5.4.1), and the formalization outlines the legal framework and policy of the digitalization process (section 5.4.2). However, Land Registration Directorate is facing some resistance to change in term of moving towards of digitalization process (section 5.6). The reasons for the resistance to the digitalization process in Land Registration Directorate views as there is a value for maintaining the paper system for reference and validity (section 5.6.1). Also, the technical advantages of using the paper and perceive risks of digital failures (section 5.6.2). Moreover, the transition to digital is seen as a threat to discretionary powers, job security and health (section 5.6.3). The sources for that resistance to change come from the Land Registration Directorate staff attitude in term of digitalization process. There are two primary sources of resistance in Land Registration Directorate (Section 5.5). One source of resistance is indirect because it is embedded and derives from current data sharing practices in the digital environment which hampers full integration and access to all data (section 5.5.1). The second most significant source for resistance in Land Registration Directorate derives from the generational gap in staff

regarding skills and attitudes, experience and knowledge, and the overlap of this gap with the organizational hierarchy of communication (section 5.5.2).

7.2.3. Objective three: *To identify the main concerns for future focused on for the digitalization process improvement within Land Registration Directorate in Bahrain.*

Against the background of various sources of and reasons for resistance, Land Registration Directorate does not deal with the opposition to the digitalization process in a proper way to address the resistance. There is a lack of a plan for knowledge transfer in experience gained, failure to implement the strategic plan for the digitalization process, weakness in consultation and participation of staff in implementing digitalization (section 5.7). Therefore, based on the core findings summarized (section 5.8), the main concern are discussed in the following order: list the 4 discussed themes (section 6)

7.3. Recommendation

The recommendations given are Land Registration Directorate should have a comprehensive analysis of internal and external environment for organizational change (section 7.3.1). Also, continuity of building capacities for the staff (section 7.3.2), and readjusting the organizational change management (section 7.3.3). Moreover, Land Registration Directorate should create a broad scale vision of organizational changes related to digitalization process (section 7.3.4).

7.3.1. Inclusive analysis of internal and external organization environment for organizational change

The Land Registration Directorate did not analyze the organizational change before it started, but the organizational change was due to the external drivers and the internal needs of the Directorate. The Land Registration Directorate must study and understand the future needs of the Directorate for organizational change more systematically, for instance using SWOT analysis. To do so, it must analyze the external environment of the Directorate, which is its opportunities and threats it faces. Also, the internal environment of the Directorate, which is the Directorate's strengths and weaknesses, must also be analyzed. Where through these interactions between the internal and external situation will help the Directorate to build right strategies and draw a roadmap for the process of digitalization.

7.3.2. Continuity of building capacities for the staff

The Land Registration Directorate should not lose sight of continuity in building-up the awareness, knowledge, and capabilities of staff to support the initiatives for organizational change to digital. That through building capacity by engaging both elder and younger managers and the staff in learning to analyze their own experiences, needs, and expectations as well as the strengths and weaknesses of them. Also, training programs needed to develop their skills to be used for continuous improvement to cope with the international practices in using digital technologies.

7.3.3. Readjusting the organizational change management

One source of resistance was indirect in Land Registration Directorate which it derives from the current data sharing practices in the digital environment. That hampers the full integration of databases and access to all data. Therefore, sharing one central land information database will enable all participants to collaborate with each other and interact efficiently to achieve their objectives at different levels in the organization.

Also, it is necessary to readjust the change management approach to be more inclusive of employees at different hierarchical levels and to foster transparency in communication with the employees about the change. Also, active employee participation in the decision-making process during digitalization reduce the overlap in communication between the management and employees, because it gives each employee the opportunity to voice their opinions, and to share their knowledge with others. Participation and consultation

with the employees enable the management to understand their ideas and gives them the power to influence the digitalization process and get from them a positive attitude towards the changes.

7.3.4. Broad vision for digitalization

Land Registration Directorate should develop a broad vision with groups comprised of old and young generations as participation and consultation and in a manner, that is sensitive to Bahraini governance culture. Vision needs to consider advantages and threat of both digital and paper, young and old expertise to find acceptance and continue the road of incremental development adjusting to contingencies, built on existing capacities. The vision needs to prevent the ad-hoc nature of digitalization described in this study; such development still needs to be flexible enough to adjust to contingencies and build on existing capacities. Also, to support future development a review of the current laws and regulations to improve the digitalization process.

7.3.5. Further Studies

Further research could study how to create an entirely digital system as a success model for the context of Land Registration Directorate because it found through this research that the moving to fully digital is still not accepted. Where in the case of Land Registration Directorate found a resistance towards the digitalization process and some source for that resistance with diverse opinion. Further in-depth studies could be recommended based on the identified main concerns which could direct to success model.

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APPENDIX A

Summary about the Land Registration Directorate interviews

	Interviewee Position	Briefly summary about interviewee	Topic Covered						
			Sub - Objective 1			Sub - Objective 2		Sub - Objective 3	
			Q .1	Q .2	Q .3	Q.1	Q.2	Q.1	Q.2
1	Land Registration Advisor	Has long experience of nearly 50 years in the Land Registration Directorate, and he is an advisor to the head of SLRB	*	*	*	*	*	*	*
2	Technical Affair Director	One of the first educated staff in the Land Registration Directorate, dealing with the old employees and having problems in trying to apply digital systems to registration processes.	*	*	*	*	*	*	*
3	Technical Affair Advisor	Joined Land Registration Directorate as an expert in GIS and was one of the most important members of the establishment of digital mapping system.		*		*	*	*	*
4	Land Information Senior	Consider as from the new generation that has contributed to the development of digital systems in the Directorate of Land Registration and responsible for land information and conservation in digital systems.		*	*	*	*	*	*
5	Legal Advisor	Legal advisor to the head of SLRB and participated in the drafting of the land registration law for 2013.			*				
6	2 of IT Seniors	They are rresponsible for the technological structure of the SLRB and the development of digital systems.	*			*	*	*	*
7	Registrar Supervisor	Has 40 years of experience in the Land Registration Directorate and has few skills in using technology and tends to work with paper.	*	*	*	*	*	*	
8	Deed Section Supervisor	Has 35 years of experience in the Land Registration Directorate and has few skills in using technology.	*	*	*	*	*	*	*
9	2 of Junior Staff	They are educated from new generation and familiar with global practices and trying to apply in the Directorate of Land Registration and have the energy and work hard to develop digital systems and find appropriate solutions to go to full digital and do not prefer paperwork.			*	*	*	*	*
10	Head of Notaries	Notary Office have a close association with the Land Registration Directorate, but they are belonging to Ministry of Justice. They are responsible for issuing ownership transfer contracts and benefits from digitalization.		*					
11	Customer no. 1	working in real estate market from long time and now his working as bank representative for registering the bank customers property		*					
12	Customer no. 2	Working in real estate market and he is working as bank representative for registering the bank customers property		*					

APPENDIX B

The topic questions guide for the interviews

Sub-Objective	Question	Anticipated result	Interview Questions
To describe the digitalization process in Land Registration Directorate in Bahrain	What are the different stages in the general digitalization process of Land Registration Directorate?	-Description of digitalization according to stages of the process	• When SLRB start using digital land record? • What were the first steps for going to digital? • Which sections are involved in the digital systems and which is not and Why? • What kind of changes happened when applying the digital systems? • Why SLRB decide to use the digital system?
	What are the current benefits of the digitalization process for Land Registration Directorate?	-Description of Benefits from digitalization process	• What are the actions or events leads to continue in the digitalization process? (new strategy, external or customer's needs…) • How does the digital record affect the LR? • How the digital record affects the registration process productivity? • How the digital record help in the transaction time? • Does the digital record simplify the LR process or not? If yes, How? If not, Why? • What about the search and retrieving of land record? • Does the citizen benefit from the digitalization or not? If yes, How? If not, Why?
	What are the reasons for currently running a dual system: on paper and digital?	-Description of why having dual system for land registration	• Does the law in Bahrain support the digitalization? If yes, How? If not, Why? • Why the LR law specifies the use of paper and digital? • What are the reasons to have dual system? • Who decided to have such a kind statement in the law and why? • Does the current law help the LR process or encumbrance? • Is there any coming update for LR law in term of digitalization?
To explore the digitalization process in terms of organizational structure and attitudes in the Land Registration Directorate in Bahrain?	How is Land Registration Directorate formalize and standardize the digitalization process?	-Description of legal frame support, and the technological infrastructure support.	• How does the legal framework support the digitalization? • Does the current law support enough the digitalization? • What is the missing in law to have a fully digital? • Which sections use the digital systems, and which is not? Why? • How is the digital infrastructure in SLRB? • Does all the staff have access to computer and internet? • Is there a central digital database for land information or not? Why? • How is the data secure within the digital system? • What about the backup for the digital system? • How is the power access for the digital system?
	What is the organizational attitude towards the digitalization process within Land Registration Directorate?	-Description of staff skills and awareness, and attitudes that affect negatively or positively on the digitalization process in terms of change to digital.	• What are the qualification average of the staff? • What are the ages of staff? • How is the knowledge transfer from the Aged staff to the Juniors staff? • Are the staff working with papers or computers? • Did they use the digital system actively? • What they prefer to use? Why? • Is there any training program support the digitalization?

			• Did the staff aware about the digital benefit? • Does the staff ask for going to digital and leave the paper? • Does the staff bring a digital initiative for change from the tradition paper system? • What are the challenges for implementing digital system in general? • Did the staff accept or resist the digital system? Why? • When digital system implemented did the staff know how to use it or not? • Does the SLRB need to train the staff to be able to work with digital system? • Does the implementation of digital system come through some acts? Or it was just by personal efforts? • What about the LR law does help the digitalization or not? Why
To identify the main concerns for future focused on for the digitalization process improvement within Land Registration Directorate in Bahrain.	How does the Land Registration Directorate deal with the attitudes to the digitalization process?	-Description about the change management style	• How does the leaders support the digitalization? • Did they believe in the digital environment or not? Why? • Did they participate the staff in the plan of digitalization or not? Why? • Did they accept the sharing information digitally or not? Why? • How is the future plan for the digitalization? • What are the objective of digitalization in LR? • What are the next steps for the digitalization in LR? • Does LR want to have a fully digital system rather than papers? Why? • Does LR want to have an integrated system with all section and automate the workflow? Why? • Does LR want to provide online services or not? Why?
	What recommendations can be made based on identified concerns from this research?	-Identify the gaps that affect the digitalization process	• What are the obstacles for having a fully digital system for LR? Why? • What LR should do to go for fully digital? • Are there any gaps in LR that prevent the fully digital? • How can LR come over those gaps and go for digital?

APPENDIX C

Photo gallery from the interviews

Part of Land Registration Directorate Interviews

Notary Office Interview

Customers Interviews