# MAKERERE UNIVERSITY

**MAKERERE UNIVERITY BUSINESS SCHOOL**

# IT CAPABILITIES, KNOWLEDGE MANAGEMENT AND INFORMATION MANAGEMENT CAPABILITY; A CASE OF HEALTH CARE PROJECTS IN EASTERN UGANDA.

**BY**

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**DECEMBER, 2023**

**PLAN 'A'**

## DECLARATION

I **KISAAKYE MARGARET**, declare that this dissertation is my own original and unaided work.

Any assistance and guidance that I have received has been duly acknowledged.

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## APPROVAL

This is to certify that this dissertation was prepared under our guidance as academic supervisors and is now ready for submission

Sign.......... Date.....06/12/2023.....

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Signature.......... Date.....06/12/23.....

**MR. KEEFA BWINO**

## DEDICATION

I dedicate this piece of work to my God, and family especially my beloved daughter Kabiredi Pearl and my dearest parents for both financial and spiritual support towards my education.

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My sincere gratitude and glorification is to my everlasting heavenly Father, my provider in time of need. This research would not have been complete without your unending guidance and unconditional love. Special and sincere thanks are bestowed to my supervisors Dr. Rehema Namono and Mr. Keefa Bwino for their consistent guidance in accomplishing this piece of work. Many thanks to Kabiredi Lincoln, Kabiredi Paloma and Kabiredi Pagiel for their timely advice and guidance on this study and academics. Many thanks to Dr. Jonathan Wangisi Massa and staff of Mbale District Health Office for the assistance provided in accessing information from other districts.

God bless and reward you all.

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## ABSTRACT

The purpose of this study was to examine the relationship between information technology capabilities, knowledge management and information management capability in Health care projects in Eastern Uganda focusing on Mbale, Iganga and Jinja. The specific objectives of the study where; to examine the relationship between IT capabilities and information management capability, to examine the relationship between knowledge management and information management capability and examine the combined effect of IT capabilities and knowledge management on information management capability. This study was underpinned by resource-based view (RBV) theory.

A quantitative cross-sectional survey was conducted on 112 health care projects from a sample size of 86 health care projects. Data were collected using self-administered questionnaires that were hand delivered to the respondents. Overall, 70 usable questionnaires representing 81.3% response rate were collected for correlation and regression analysis. The validity and reliability analysis showed that the study variables least 0.7 and above.

The analysis

of data involved descriptive statistics for demographics, correlations and regression analyses for answering the research questions. The results revealed a strong positive and significant relationships between the; IT capabilities and information management capability ($r = .480^{**}$, $p<.01$), and knowledge management and information management capability ($r =.516^{**}$, $p<.01$). Based on the study findings, recommendations were given regarding the need to strengthen IT capabilities and knowledge management so to enhance information management capability in health care projects in Eastern Uganda.

# CHAPTER ONE

## 1.0 Introduction

This provides the background to the study, statement of the problem, purpose of the study, objectives of the study, research questions, research hypothesis, scope of the study, significance of the study and conceptual framework for the research.

## 1.2 Background of the study

The potentiality of information management in the health care projects can reshape the healthcare system of a country (Kyoungyoung & Kim, 2013; Berdik et al., 2021). As such, many business reports and white papers focusing on healthcare have insisted that, if properly applied, information management could be used to guarantee public health, determine and implement appropriate treatment paths for patients, support clinical improvement, monitor the safety of healthcare systems, assure managerial control, and promote health system accountability to the public (Silven et al., 2020). Accordingly, most governments and healthcare stakeholders are currently operating or planning information management projects (Kassen, 2022). Kyoungyoung & Kim, (2013) assert that information management is a step-by-step approach to setting the right goals to towards achieving information management capability in a firm. As such, information management capability, such as data integrity, hardware & software reliability and user-friendly mechanisms, have been considered as vital for the implementation of public health projects universally (Jha et al., 2022). Moreover, information management capability has been found to play a significant role in developing health care projects based on modern technological solutions (Laurisz et al., 2023).

On a global note, Macías-Jiménez et al., (2020) asserts that the need for enhancing information management capability efforts is particularly urgent for public sector institutions that continue to struggle with operational deficiencies. For example; in South America, public sectors such as

logistics and transport grapple with access to information, deterioration due to inappropriate information storage conditions, and even loss of information (Macías-Jiménez et al., 2020). Similarly, African countries have been characterized with poor information management capabilities. For example, Mutula & Wamukoyac (2009), revealed that African governments have weak records systems with regard to e-records; inadequate information management skills and poorly developed IT and telecommunication infrastructure. These makes it hard to collect, organize process and ably maintain information in organizations. In Uganda, there are efforts towards quality health data and information management systems put in place to build abilities to manage information for example, the implementation of district health information management system (Chinecherem et al., 2017). Information management abilities is still wanting while using manual systems. For example, Kagoya and Kibule (2018) reveal that health centers in Uganda are not having any type of quality assurance during data collection, organizing, processing and dissemination of health care information, archiving and this has made retrieval of patients' information being laborious and tedious. Additionally, evidence has showed that medical information system used by health care projects in Ugandan hospitals could not allow patient level information sharing and makes it hard for doctors that want to discuss the patient's medical situation with other doctors or researchers (Nabimanya et al., 2020).

Previous researchers have acknowledged the role of IT capabilities in enabling information management. However, these have examined IT capability as a single resource ignoring the contribution of information technology capabilities as a bundle of resources in enabling information management (Labadie & Legner,2019; Ashrafi et al., 2019; Legner et al., 2020). IT is crucial as it provides the infrastructure enabling information processes and fully automated activities like information generation, analytics, visualization, or warehousing (Ashrafi et al., 2019). In order to realize superior performance, organizations need IT-competencies across all

structural levels and IT managers for investment and deployment decisions (Ashrafi et al., 2019). Equally important is the contribution of knowledge management on information management capability. For example, Al-Samarraie et al., (2020) assert that the failure of health information system also commonly known as telemedicine is mainly attributed to lack of information on how to sustainably implement and manage such system. Though there's extant literature on information management capability (Hurley ,2018; Gur et al. 2021), a few have examined it in developing countries such as Uganda yet they are prone to particular information management challenges for example, Basajja and Nambobi, 2022) found that in Uganda, there is scarcity of comprehensive knowledge on combined effect of information technology capabilities and knowledge management on information management capability. The RBV theory would suggest that IT capabilities can improve on an organization's ability to collect, process, and analyse information can be a significant source of competitive advantage (Behl et al., 2022). This capability can lead to better insights, more informed decision-making, and improved overall performance. Therefore, this study seeks to establish the antecedent role of information technology capabilities and knowledge management on information management capability from a resource based theoretical lens.

### 1.3 Problem statement

Healthcare projects need to transition their operations towards a data-driven mentality through building information management abilities, this helps to handle huge information base generated in their routine activities (Chinecherem et al., 2017). To have a complete history of a patient, there is a need for all medical information to be availed in an integrated and reliable manner (Kuipers et al., 2019). In Uganda, there has been efforts towards quality health data and information management systems put in place to build abilities to manage data for example, the implementation of district health information management system (Umezuruike et al., 2017). Despite the efforts,

the sector faces numerous information related challenges, which include but not limited to, lack of sufficient funds to invest in information technologies, insufficient technical capacity, access to quality patient information on time (Kuipers et al., 2019) which renders service delivery a challenge. To be specific, (USAID/SUSTAIN report, 2011; MSH/STAR-E report, 2017) on health care projects in eastern Uganda, there is still face unprecedented issues related to information management such as poor-quality assurance in information management, lost patient records thus making it hard in archiving and retrieval of patients' information when required. Conclusively, it can be noted that medical information system used by health care projects also could not allow patient level information sharing and reporting which makes it hard for doctors to discuss the patient's medical situation with other doctors (Egwar Alunyu et al., 2021).

### 1.4 Purpose of the study

The study seeks to examine the relationship between IT capabilities, knowledge management and information management capability of health care projects in the Eastern Uganda.

### 1.5 Research objectives

i. To examine the relationship between IT capabilities and information management capability of Health care projects in Eastern Uganda.
ii. To examine the relationship between knowledge management and information management capability of Health care projects in Eastern Uganda.
iii. To establish the combined effect of IT capabilities and knowledge management on information management capability of Health care projects in Eastern Uganda.

## 1.6 Research questions

i. What is the relationship between IT capabilities and information management capability of Health care projects in the Eastern Uganda?

ii. What is the relationship between knowledge management and information management capability of Health care projects in the Eastern Uganda?

iii. What is the combined effect of IT capabilities and knowledge management on information management capability of Health care projects in the Eastern Uganda?

### 1.6.1 Hypothesis

H1: IT capabilities positively associates with information management capability.

H2: Knowledge management positively associates with information management capability.

H3: IT capabilities and knowledge management positively associates with information management capability.

## 1.7 Scope of the study

The scope covers the geographical, content and time scope of the study.

### 1.7.1 Geographical scope

The study was carried out in selected health care projects based located in the Eastern Uganda.

### 1.7.2 Content scope

The study established IT capabilities and knowledge management as independent variables and information management capability as a dependent variable. IT Capabilities was measured using dimensions of IT infrastructure, IT human resource, IT relationship resource, and resource

commitment adopted from Mao et al., (2016). Knowledge management was measured using dimensions such as knowledge acquisition, information distribution, information interpretation adopted from Hult et al., (2007). Information management capability was measured based on dimensions of collecting information, organizing information, processing information and maintaining information adopted from Kettinger et al., and Brinkhues et al (2015).

### 1.7.3 Time Scope

The study was conducted between July, 2023 and August, 2023.

## 1.8 Significance of the study

### 1.8.1 To practice

This study may help facility managers and practioners to devise means and strategies of improving information management services of their health centers, hospitals and other facilities in order to satisfy the pending needs of their clients.

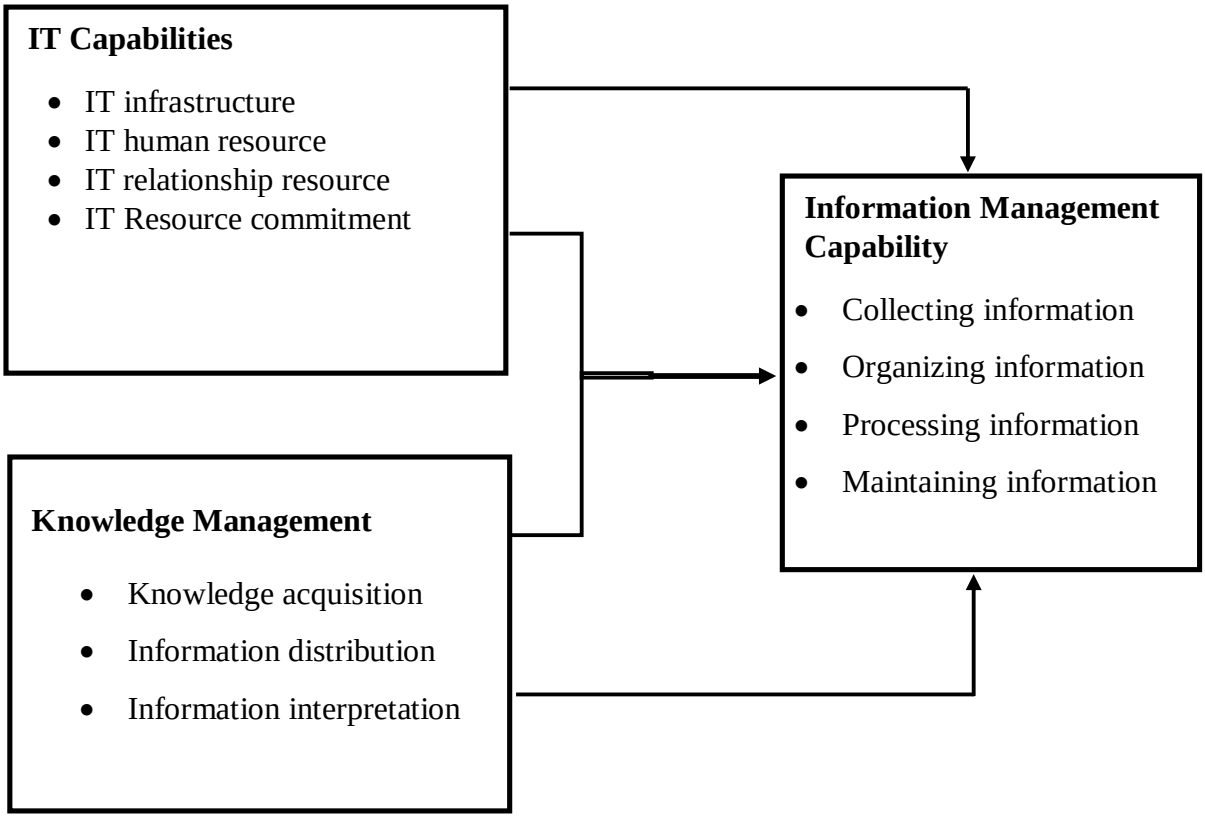
### 1.8.2 Policy

The government of Uganda and its agencies such as ministries can use the findings to draft polices that help health facilities firms and even government agencies to improve on management of data and information from health centers facilities to the ministry of health for proper record management.

### 1.8.3 To academia

The study is a resourceful material for academic research by adding on to the literature on data management and information management knowledge body.

### 1.9 Conceptual framework




***Source***: Developed from reviewed literature (Mao et al., 2016; Hult et al., 2007; Kettinger et al., 2015; Brinkhues et al., 2015)

#### 1.9.1 Description of the model

The conceptual model suggests that both IT capabilities and Knowledge management are significantly and positively related to information management capability. IT Capabilities was measured using dimensions of IT infrastructure, IT human resource, IT relationship resource, and resource commitment adopted from Mao et al., (2016). Knowledge management was measured using dimensions such as knowledge acquisition, information distribution, information interpretation adopted from Hult et al., (2007). Information management capability was measured

based on dimensions of collecting information, organizing information, processing information and maintaining information adopted from Kettinger et al., and Brinkhues et al., (2015).

# CHAPTER TWO

# LITERATURE REVIEW

## 2.0 Introduction

This section provides a review of literature relating to IT capabilities, knowledge management and information management capabilities. The section begins with the theoretical underpinning and goes on to explain the study variables and the relationships between them in accordance with the objectives of the study.

## 2.1 Theoretical Review.

### 2.1.1 Resource based view theory

This study was underpinned by the Resource-Based View (RBV) theory. This conceptual review adopts the RBV to explain the relationship between the independent variable and the dependent variable. (Sharma et al., 2021). According to the RBV, a firm's competitive advantage is based on its capacity to make use of the available bundle of valued intangible and tangible resources (Barney, 1991). These resources must be valuable, rare, inimitable, and non-substitutable (VRIN), according to the argument (Barney, 1991). As such, the theory suggests that a firm's IT capabilities, such as its technological infrastructure, software, and IT-related skills, can be a valuable resource for gaining a competitive advantage (Muazu & Abdulmalik, 2021). For instance, a company with advanced IT capabilities may be able to streamline its processes, enhance efficiency, and respond more effectively to market changes (Al-Jaroodi et al., 2020). Also, knowledge can be considered a critical resource for organizations (Ganguly et al., 2019). Therefore, effective knowledge management practices, such as capturing, sharing, and leveraging knowledge, can lead to better decision-making, innovation, and ultimately, competitive advantage

(Areed et al.,2020). Managing information effectively is crucial in the modern business environment. The RBV theory would suggest that an organization's ability to collect, process, and analyse information can be a significant source of competitive advantage (Behl et al., 2022). This capability can lead to better insights, more informed decision-making, and improved overall performance.

### 2.2 The concept of information management capability

In the current information-rich environment, firms must generate, provide, store, distribute, tailor, and use significant volumes of internal and external information (Giovanna et al., 2021). As such, the role of data for organizations increases constantly and, thus, becomes crucial for developing data driven services, business models, and more generally innovation (Azkan et al., 2020). This ability to manage and leverage information to compete in markets is referred to as information management capability (Sunil et al., 2011; Liao et al., 2020). Sunil et al., (2011) define information management capability as "the ability to provide data and information to firms with the appropriate levels of accuracy, timeliness, reliability, security, and confidentiality; provide universal connectivity and access with adequate reach and range; and tailor the information structure infrastructure to emerging business needs and directions." It aims at the efficient usage of data as it includes several functions for the formulation of a data strategy, measures, standards, the assignment of roles and responsibilities (Otto, 2011), and management of applications and systems (Pentek et al. 2017)

According to Kettinger et al., (2015) information management capabilities can be conceptualized using dimensions of collecting information, organizing information, processing information and maintaining information. Collecting information can be defined as the ability of identifying and gathering information from key sources both inside and outside of a person's workplace.

Organizing information includes indexing, classifying, and arranging information in a systematic manner for future access; processing information deals with the assessment and analysis of information for decision-making and value creation; and maintaining information keeps information updated for enhanced organizational performance (Kettinger et al., 2015). Thus, the four competences are interdependent and constitute a higher-level capability of intra-individual information management

### 2.3 The concept of Information technology capabilities

IT capabilities reflect a firm's valuable and non-substitutable ability to acquire, deploy, combine and reconfigure internal and external IT resources to effectively support business flow, logistics flow and capital flow (Lu & Ramamurthy, 2011; Zeng & Lu, 2020). Though there are many definitions of IT capabilities, Lu & Ramamurthy (2011) & Bajgorić et al., (2022) claim to have a comprehensive understanding of the concept. They define IT capability as the ability to mobilize and deploy IT-based resources in support of and for the enhancement of business strategies and work processes. Mao et al., (2016) measure IT capabilities using dimensions of IT infrastructure resource, IT human resource, IT relationship resource and resource commitment. Accordingly, IT infrastructure resource is defined as the technological foundation of an organization to ensure accurate, real-time, and comprehensive information for communication (Mao et al., 2016; Alshurideh et al., 2022).

As such IT infrastructure enables an organization to manage data accurately and create connected network channels, the business spanning capabilities dimension indicates an integrated relationship among the overall IT capabilities inside the organization and decision makers in order to gain superior analysis, planning and execution for organizations strategies (Lu & Ramamurthy, 2011). IT human resource is defined as the technical and managerial IT skills of the employees of

an organization (Mao et al., 2016). Thus, IT human resource relates to employee's skills to IT usage, self-study and high motivated to do IT related work (Hee et al., 2019). IT relationship resource refers to the relationship between IT and business units, which reflects the level of trust and willingness to share risk and responsibility (Mao et al., 2016; Alshurideh et al., 2022). The internal and external communication capabilities describe how organizations deploy IT systems for partner's management, making full use of IT systems to communicate and cooperate with key partner's other information technologies (Lu & Ramamurthy, 2011).

### 2.4 The concept of Knowledge management

Duhon (1998) defined Knowledge management as an integrated approach to identify, capture, evaluate, retrieve, and share all information, and this information could be in the forms of database, document, policy, procedure, and formerly uncaptured expertise and experience in individual workers. Furthermore, knowledge management can be defined as a process of creating, acquiring and transferring knowledge that is reflected in the behavior of the organization (Antunes et al., 2020). Therefore, it brings concern to the creation, storage, dissemination, and application of organizational knowledge within the supply chain (Lim et al, 2017). Consequently, practicing Knowledge management in an organization ensures that the most reliable, accurate knowledge is utilized efficiently, leading to the best products and services being offered (Sambasivan et al., 2009; Abbas et al., 2022). Knowledge management processes are essential for effective knowledge management. They require turning personal knowledge into corporate knowledge that can be widely shared and appropriately applied (Lei et al., 2021). By implementing Knowledge management processes as part of daily business activities, organizations can confidently compete and sustain in the competitive markets (Daud and Yusuf, 2008; Bhardwaj, 2019) and environments.

According to Hult et al., (2007), the dimensions for knowledge management are knowledge acquisition, Information distribution, and shared meaning. Knowledge acquisition is the process by which entities, such as organizations or supply chains, obtain wisdom (Faroukhi et al., 2020). It is an important source of new knowledge for a firm from external partners (Nielsen, 2006) and it has become a competitive necessity as no company can be expected to develop all the necessary knowledge inside the firm (Ferraris et al., 2019). Information distribution is the process by which information from different sources is shared (Hult et al., 2007). It is the process of transferring knowledge throughout the organization (Alavi and Leidner, 2001) and this implies managing the knowledge exchange in the organization to encourage innovation, increase awareness of great past procedures and make users adopt better procedures for their future decision making (Duryan et al., 2020). Information interpretation is the process by which members develop common understandings about data and events (Dahlmann & Roehrich, 2019). Given the lack of a strong culture in firms, shared meanings of data and events are needed to harness collective action (Maciel, 2020).

### 2.5 IT capabilities and information management capability

Previous research has shown the contribution of IT capabilities towards information management capability in a firm (Sher & Lee, 2004; Kettinger et al., 2015; Kettinger et al., 2021). For example, Kettinger et al., (2021) assert that since information use crosses enterprise functional boundaries, information management relies on the interface between IT Capabilities to build mutual trust and understanding. As such, firm-wide IT capabilities are critical to realize business value and sustain competitive advantage. This is because IT capabilities enable firms to manage information by building information management capabilities (Yasmin et al., 2020). Thus, IT-enabled capabilities can be launched with digital information management technologies (Nwankpa and Roumani,

2016). For conceptual clarity, while IT capability has been defined as a firm's ability to acquire, deploy, combine, and reconfigure IT resources in support and enhancement of business strategies and work processes (Lu and Ramamurthy, 2011; Bagaric et al., 2022), information management capability requires such competencies as the ability to provide data and information to users with appropriate accuracy, punctuality, reliability, security, and confidentiality; the ability to provide universal connectivity and access to information; and the ability to adapt infrastructure to the emerging needs and directions of the market (Sunil et al., 2020).

Information management capability not only recognizes the importance of excellent IT practices, but it holistically offers equal focus to the stewardship of information across its lifecycle and places critical emphasis on excellent information behaviors and values by its stakeholders. According to Akram et al., (2018), the integration of IT capabilities and information management capabilities are critical for organizations to create value and gain a sustainable competitive advantage. For example, the integration of IT capabilities such as data analytics tools with information management capability enables organizations to effectively manage and use the analyzed data to make informed decisions, improve efficiency, and reduce costs (Berdik et al., 2021). This therefore leads to the following hypothesis:

***H1. Information technology capabilities positively influence information management capability.***

### 2.5.1 Knowledge management and information management capability

The importance of knowledge as a source of competitive advantage has been recognized by the knowledge-based view of the firm. Because of the relevance of knowledge, academics and practitioners are becoming increasingly interested in knowledge management as a discipline (Ode & Ayavoo, 2020). For example, prior research found that information management capabilities

have a positive impact on perceived usability of organizational knowledge management activities (Yi et al., 2021). Similarly, Ho (2009) reveals that knowledge management enablers in the domain of information management capabilities are the infrastructures for information technology that supports knowledge management activities such as knowledge databases, knowledge platforms, performance evaluation management systems, and performance integration systems. Szymkowiak et al., (2021) agree that information technology plays an important role in supporting the organizational knowledge process. Information technology is tightly connected to knowledge management because it helps distribute structural knowledge vertically and horizontally, as well as make it easily searched and utilized. As a result, organizations and enterprises all try to implement knowledge management processes through information or data management capability. Business houses have acknowledged greater IT capability as an underpinning of generating firms' ability to identify and act in response to market-related changes (Lu & Ramamurthy, 2011; Bajgorić et al., 2022). Thus, knowledge management (KM) capabilities and information management contribute organizational agility (Panda & Rath, 2021).

According to Huang et al., (2021), effective knowledge management requires an organization to manage its intellectual assets effectively. Moreover, to effectively manage these assets, an organization must have a robust information management capability (Huang et al., 2021). This involves collecting, storing, and analyzing information to support decision-making processes and to facilitate knowledge sharing (Kettinger et al., & Brinkhues el al., 2015). For example, an organization may use a knowledge management system to capture and store knowledge and make it accessible to employees (Al Ahbabi et al., 2019). As such, an effective knowledge management system, the organization must have an efficient information management system that ensures the

accuracy, completeness, and timeliness of the data collected (Huang et al., 2021). This therefore leads to the following hypothesis:

***H2. Knowledge management capability positively influences information management capability.***

### 2.5.2 Combined effect of IT capabilities and Knowledge Management on information management capabilities.

The combination of IT capabilities and knowledge management has the potential to significantly enhance an organization's information management capabilities. Past studies such as Ali et al., (2020) have suggested that IT capabilities can enhance group members' ability to share knowledge. As such, previous studies on computer-mediated communication have also shown that the use of IT can indeed facilitate the sharing of knowledge among group members (Wheeler and Valacich 1996). Consequently, IT capabilities can also facilitate more effective knowledge application in teams (Ali et al., 2020). This in turn facilitates information management capability since data is readily available. Based on these previous findings, it's clear the joint effects of IT capability and knowledge management capabilities on firm positively associated with information management capabilities. Studies have shown how the use of advanced IT influences the way team members integrate knowledge (Yoo et al. 2006; Wang et al., 2022). This is because IT capabilities enable organizations to capture, store, and process vast amounts of data, while knowledge management enables organizations to capture, share, and leverage tacit and explicit knowledg (Hedayati & Schniederjans, 2023). Thus, the combination of these capabilities can enhance an organization's ability to manage information effectively. In this regard, studies have shown how IT allows team members to solve complex problems and invent new solutions by taking diverse perspectives into

consideration (Boland and Tenkasi 1995). IT also allows tacit knowledge to be captured in a more standardized format so that it can be readily applied in different contexts.

Similarly, studies have shown that the integration of IT capabilities and knowledge management can lead to improved information sharing, collaboration, and knowledge creation (Alavi and Leidner, 2001; Choi and Lee, 2002; Singh and Kant, 2017). This, in turn, can lead to better decision-making, increased innovation, and improved organizational performance (Lee et al., 2014). For example, a study by Lee et al. (2014) found that the combination of IT capabilities and KM practices had a significant positive effect on knowledge creation and sharing, which led to improved organizational performance. Thus, a study by Singh and Kant (2017) found that the integration of IT capabilities and knowledge management practices led to better decision-making and improved organizational performance. This therefore leads to the following hypothesis:

***H3. Information technology capabilities and knowledge management have a positive influence on information management capabilities.***

### 2.5.3 Conceptual gaps in literature

In existing literature, the following gaps have been identified by scholars. On the relationship between IT capabilities and information management capability, scholars are suggesting lack of comprehensive theoretical frameworks (Baker & Nelson, 2005; Bharati et al., 2009; Schniederjans et al., 2020). Further, there is limited focus on organizational factors (Fichman et al., 2014; Mamonov & Peterson,2021). Most studies in this area focus on the technical aspects of IT capabilities and information management capability, while neglecting the importance of knowledge management factor such as knowledge acquisition, distribution, shares meaning, leadership, and governance (Fichman et al., 2014; Lam et al., 2021). Similarly, some of the scholars call for longitudinal studies since many studies are cross-sectional and focus on a single point in time, making it difficult to draw conclusions about the causal relationships between IT capabilities and information management capability over time (Bharati et al., 2009). On the

relationship between knowledge management and information management capability**,** Alavi & Leidner, (2001) and Lee & Choi, (2003) suggest the need for more empirical studies to provide concrete evidence of this relationship. This is because there is a considerable amount of theoretical work on the relationship between knowledge management and information management capability, few empirical studies have been conducted to validate these theories (Alavi & Leidner, 2001; Lee & Choi, 2003; Zhou et al., 2020). Further, Becerra-Fernandez & Sabherwal (2010) calls for attention on the role of technology in this relationship between knowledge management and information management capability. This is because technology plays a critical role in both Knowledge Management and Information Management capability yet many studies do not address the specific role of technology in these concepts (Becerra-Fernandez & Sabherwal, 2010; Dwivedi et al., 2022).

# CHAPTER THREE

# RESEARCH METHODOLOGY

## 3.0 Introduction

This section covers the research design, Study population, sampling procedure, data Collection instruments, measurement of variables, reliability, validity, data processing and ethical considerations.

## 3.1 Research design

Creswell et al., (2017) defines research design as a framework that outlines the procedures for conducting a research study. The researcher applied a cross-sectional research design along with a quantitative research approach. Cross-sectional research design is a type of observational study in which data is collected at a single point in time from a sample of individuals or groups. The cross-sectional research design was adopted because it is essential and convenient when collecting data at one point in time (Bryman, 2004). Cross-sectional research design also facilitates large sample coverage as every participant participates only once or in a snapshot, which saves time (Creswell, 2014).

## 3.2 Study population

According to Creswell (2014) study population refers to the entire group of individuals or events about which you want to generalize the findings of your study. The study population comprised of 112 Health care projects in Eastern Ugandan. (MoH National Health master list 2022). The population included projects operating in private for profit, private not for profit and government health facilities in the districts of Mbale, Jinja and Iganga

### 3.3 Unit of analysis

According to Bryman (2016), the unit of analysis is the object of analysis in a research project, defined in terms of the level of aggregation chosen by the researches. The unit of analysis in this study constituted of the health care projects in health facilities in three categories of private for profit, private not for profit, and government health facilities in the region.

### 3.4 Unit of inquiry

Tabachuich & Fider, (2010) define unit of inquiry as the actual members from which data is to be collected. The unit of inquiry in this study included the project coordinators at health facility, health facility managers, project IT officers, data assistants. This is because their task and duties are in line with information management making them knowledgeable and suitable for this study

### 3.5 Sample size

Sample size is the number of individuals or units that are included in a sample from a population for a given research study or survey (Sekaran and Bougie, 2016). The sample size was 86 health care projects operating in health facilities in three categories of private for profit, private not for profit, and government health facilities which was determined using the table for sample size determination (Krejcie &Morgan, 1970).

### 3.6 Sampling technique

Sampling is the process of selecting a subset of individuals or objects from a larger population, in order to make inferences about the entire population (Creswell, 2014). Simple random sampling is a method of selecting a sample from a population where each member of the population has an equal chance of being selected, and once a member has been selected, they are not put back into the population for subsequent selections (Sekaran and Bougie, 2016). A simple random sampling

without replacement was applied to select a sample of healthcare projects This involved listing down the names of healthcare projects and allocating a number to each of them. Then numbers were selected randomly and each number selected were removed from the population to avoid duplication, until the required number is achieved.

### 3.7 Data collection instrument

Data was collected using a self-administered questionnaire, rated using a 5-Point Likert scale ranging from; 5-strongly agree, 4-agree, 3-Not sure, 2-disagree and 1-strongly disagree. The scale is selected to provide respondents with the extent to which they agree with the different notions (Likert, 1961). The questionnaire was divided into key sections to address precisely each variable. These included; background information of the respondents, firm characteristics, information management capability, IT capabilities and knowledge management. Finally, the questionnaire instrument is embraced because it enables obtaining data from a large sample, and it is the most appropriate tool for collecting quantitative data (Saunders, Lewis &Thornhill, 2007).

#### 3.8.1Validity and reliability

The validity of the study refers to the extent to which the data collection instruments accurately measure what they intend to (Amin, 2005). In this study, expert judgment and content validity index (CVI) was used. After drafting the questionnaire, it was shared with academic supervisors and experts to provide comments regarding the appropriateness and understandability of the items contained in the instrument. Based on their comments, the questionnaire was amended. CVI was used where the researcher distributed the questionnaire to specific people who are conversant about the subject, not necessarily those targeted by the study to express the content validity. Based on the results obtained, the researcher computed CVI using the formula, K/N where; K is the number

of items identified as valid and N is the number of items under each construct. As a general rule, CVI should be 0.7 or better under to be considered valid (Creswell, 2014). The same threshold applied to this particular study. Depending on the results, the questions were rephrased.

### 3.8. 2Reliability

Reliability refers to the consistency and stability of a measure or instrument in producing the same results under consistent conditions (Trochim, 2006). It is the degree to which a research instrument or measurement tool consistently measures what it is supposed to measure. Reliability was determined using the Cronbach Alpha coefficient to check for consistency in the responses. Cronbach Alpha coefficient was computed based on the field results. Nunnally and Bernstein (1994) indicate that the instrument is regarded as reliable when the Cronbach alpha coefficient obtained under each construct and variable is at least 0.7. The same scale was used to determine the reliability of the questionnaire.

**Table 1: Reliability and Validity**

| *Variable* | *Cronbach Alpha* | *Anchor* | *Content Validity Index* |
|---|---|---|---|
| IT Capabilities | .898 | 13 | .813 |
| Knowledge Management | .775 | 13 | .846 |
| Information Management Capability | .704 | 11 | .818 |

Source: **Primary data 2023**

### 3.9 Measurements of the research variables

IT capabilities was measured using dimensions of IT infrastructure, IT human resource, IT relationship resource, and resource commitment adapted from Mao et al., (2016). Also**,** Knowledge management was measured using dimensions such as knowledge acquisition, information

distribution, shares meaning adapted from Hult et al., (2007) & Colomo-Palacios, R. (2014). Lastly, Information management capability was measured based on dimensions of collecting information, organizing information, processing information and maintaining information adapted from Kettinger et al., and Brinkhues et al., (2015).

### 3.10 Data processing and analysis

Data analysis refers to the process of examining, interpreting, and drawing conclusions from data. It involves applying statistical and analytical methods to extract meaningful insights and patterns from large volumes of data (Field, 2013). Data collected from the field was analyzed using Statistical Package for Social Sciences (SPSS v.25) so as to summarize it for quick interpretation. Further, data was aggregated to make one representation. Pearson's correlation coefficient was performed to establish the relationship between information technology capability, knowledge management and information management capability. Regression analysis was also be conducted to test information management capability and information management capability, knowledge management capability and information management capability and lastly multiple regression to test the combination effect.

### 3.12 Ethical consideration

The researcher approached respondents with clear identifications for instance an introductory letter from the Faculty of Graduate Studies and Research (FGSR). The researcher maintained a high ethical conduct through seeking permission from respondents, not mentioning names of respondents and destroying of the questionnaires after data analysis and presentation.

# CHAPTER FOUR

# DATA ANALYSIS, PRESENTATION AND INTERPRETATION OF FINDINGS

## 4.0 Introduction

This chapter presents the data analysis and interpretation of the results to answer the study objectives starting with the respondents‟ demographics and the descriptive analyses as in the preceding chapter.

## 4.1 Background characteristics

The individual and project characteristics of the respondents.

### 4.1.1 Characteristics of respondents/individuals

The results presented in table 2 below reflects the attributes of individual respondents obtained from the study. These include; age bracket, highest level of education, period worked for the project and position in project. The respondents were dominantly in the 26 – 30year age group (41.4%) and only 7.1% were aged above 40 years of age group. The results are an indication that the majority of the medical staff working in health care projects are youths and could be relied upon to give information for the study which is quite credible and constructive.

**Table 2: Age bracket**

| *Age Bracket* | Count | Valid Percent | Cumulative Percent |
|---|---|---|---|
| 20 – 25 | 8 | 11.4 | 11.4 |
| 26 – 30 | 29 | 41.4 | 52.9 |
| 31 – 35 | 17 | 24.3 | 77.1 |
| 36 – 40 | 11 | 15.7 | 92.9 |
| Above 40 | 5 | 7.1 | 100.0 |
| Total | 70 | 100.0 | |

Source: **Primary data 2023**

The results in table 3 below show that majority of the respondents (40.0%) working in health care projects hold a diploma as their highest level of education while a few (2.9%) of the respondents hold master's degree. This is an indication that majority of the respondents are able to read, understand and interpret the questionnaires thus being able to give valid information.

**Table 3: Level of education**

| *Level Of Education* | Count | Valid Percent | Cumulative Percent |
|---|---|---|---|
| Certificate | 23 | 32.9 | 32.9 |
| Diploma | 28 | 40.0 | 72.9 |
| Bachelor's Degree | 17 | 24.3 | 97.1 |
| Master's Degree | 2 | 2.9 | 100.0 |
| Total | 70 | 100.0 | |

***Source*: Primary Data 2023**

The majority of the respondents as reflected in the table 4 below have worked on health care projects between 1-5 years (45.7%), followed by 6-10 years (41.4%) and the least being 16-20 years (1.4%). This implies that majority staff on health care projects can provide reliable information concerning the different projects.

**Table 4: Period worked for this Project**

| *Tenure* | Count | Valid Percent | Cumulative Percent |
|---|---|---|---|
| 1-5 years | 32 | 45.7 | 45.7 |
| 6-10 years | 29 | 41.4 | 87.1 |
| 11-15 years | 6 | 8.6 | 95.7 |
| 16-20 years | 1 | 1.4 | 97.1 |
| Over 20 years | 2 | 2.9 | 100.0 |
| Total | 70 | 100.0 | |

***Source*: Primary Data 2023**

The majority of the respondents as reflected in the table below are data assistants (24.39%), followed by project technical officers (18.6%) and the least being Project IT Officers (7.1%). The

response of data assistants could be explained by their timely presence on the project activities in the health facilities.

**Table 5: Position in this Project**

| *Position In This Project* | Count | Valid Percent | Cumulative Percent |
|---|---|---|---|
| Project Manager | 11 | 15.7 | 15.7 |
| Project Technical Officers | 13 | 18.6 | 34.3 |
| Medical Officers | 10 | 14.3 | 48.6 |
| Project IT Officers | 3 | 4.3 | 52.9 |
| Data Assistants | 17 | 24.3 | 77.1 |
| Health Information Assistants | 9 | 12.9 | 90.0 |
| Others specify | 7 | 10.0 | 100.0 |
| Total | 70 | 100.0 | |

***Source*: Primary Data 2023**

### 4.1.2 Project characteristics

The results presented in table 3 below depict project characteristics attained from the study, including years this project has been running and nature of operations.

The results in table 6 below indicate that majority health care projects fall under the over 5years age group (81.4%) in health facilities in Eastern Uganda and only a few (2.9%) have operated for less than 2 years. This implies that majority of projects in health facilities can be relied for information since they have operated for a good number of years.

**Table 6: Project duration**

| *Project duration* | Count | Valid Percent | Cumulative Percent |
|---|---|---|---|
| 1 - 2 Years | 2 | 2.9 | 2.9 |
| 2 - 5 years | 11 | 15.7 | 18.6 |
| Over 5 years | 57 | 81.4 | 100.0 |
| Total | 70 | 100.0 | |

***Source*: Primary Data 2023**

The results in table 7 below show that majorly private health facilities (55.7) responded to the questionnaires compared to the public health facilities (41.4) and the least being Private-Public Partnership health facilities (2.9%). The high response of private health facilities could be attributed to their easy accessibility.

**Table7: Nature of operations**

| *Nature of Operations* | Count | Valid Percent | Cumulative Percent |
|---|---|---|---|
| Public | 29 | 41.4 | 41.4 |
| Private | 39 | 55.7 | 97.1 |
| Private-Public Partnership | 2 | 2.9 | 100.0 |
| Total | 70 | 100.0 | |

***Source*: Primary Data 2023**

### 4.3 Correlation Analysis

The Pearson (r) correlations coefficient was employed to examine the relationship between variables to answer research questions as presented below in table 8

**Table 8: Relationship between the study variables**

| | **Mean** | **SD** | **1** | **2** | **3** |
|---|---|---|---|---|---|
| IT *Capabilities*-1 | 3.948 | .796 | 1.000 | | |
| Knowledge *Management*-2 | 4.225 | .644 | .577** | 1.000 | |
| Information Management *Capability*-3 | 4.579 | .448 | .480** | .516** | 1.000 |

**. *Correlation is significant at the* 0.01 level (2-tailed).

***Source:* Primary Data**

The results in the table above show that there is a strong positive relationship between the study variables and this is because their Correlation coefficient values are in the range -+ 0.5 and -+ 1. Additionally, variable descriptive were (Mean = 3.948, SD = .796) and (Mean = 4.225, SD = .644) respectively are concentrated to measure of central tendency which further shows a strong relationship between variables under study. Further research shows that there is need to improve on the concepts of Information management capability (Mean = 4.579, SD = .448).

### 4.3.1 The relationship between IT capabilities and information management capability.

A positive and significant relationship is revealed between IT capabilities and information management capability (r = .480**, *p*<.01). This implies that health care projects that enhanced IT capabilities in their operations are likely to enhance information management capability.

### 4.3.2 The relationship between knowledge management and information management capability.

The results in the table above show a positive and significant relationship between knowledge management and information management capability (r =.516**, *p*<.01). This implies that health care projects that enhanced their knowledge management capabilities have a possibility of enhancing their information management capability.

### 4.4 Multiple Regression Analysis

The regression analysis was applied as reflected in table 9 below to examine the level to which the predictor variables such as IT capabilities and knowledge management can predict information management capability in health care projects. The results in table 9 reveal that IT capabilities and knowledge management can account for 29.5% of the variance in information management capability (Adjusted R Square = .295) and the remaining percentage (70.5.3%) may be attributed to other factors outside this study. Further, Knowledge management has the strongest influence on information management capability (*Beta* =.358, p < .05) compared to IT capabilities (*Beta*= .273, p < .05). Both IT capabilities and knowledge management are significant predictors of information management capability.

**Table 9: Regression model for information management capability**

| | B | *Std. Error* | *B* | t | Sig. | Tolerance | VIF |
|---|---|---|---|---|---|---|---|
| (Constant) | 2.921 | .307 | | 9.517 | .000 | | |
| IT Capabilities | .154 | .070 | .273 | 2.207 | .031 | .667 | 1.499 |
| Knowledge Management | .249 | .086 | .358 | 2.897 | .005 | .667 | 1.499 |
| ***Dependent Variable***: Information Management Capability | | | | | | | |
| R | .562 | | | | | | |
| R Square | .316 | | | | | | |
| Adjusted R Square | .295 | | | | | | |
| Std. Error | .376 | | | | | | |
| F Statistic | 15.464 | | | | | | |
| Sig. | .000 | | | | | | |

***Source:*** **Primary Data 2023**

# CHAPTER FIVE

# DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

## Introduction

This chapter provides the discussion of the findings of the study and thereafter delivers conclusions, recommendations, limitations and areas for further research are suggested.

## 5.2 Summary of findings

### 5.2.1 The relationship between information technology capabilities and information management capability.

The results suggest that information technology capabilities are positively and significantly related to information management capability. This finding implies that health care projects which build IT capabilities in their operations are likely to enhance their abilities in managing information. This finding is in line with studies by (e.g., Yasmin et al., 2020; Kettinger et al., 2021). Kettinger et al., (2021) indicates that IT capabilities builds an interface which allows information usage across enterprise functional boundaries which helps to create mutual trust and understanding. Similarly, Yasmin et al., (2020) revealed that IT capabilities enable firms to manage information by building information management abilities since firm-wide IT capabilities are critical to realize business value and sustain competitive advantage. Therefore, we can conclude that the integration of IT capabilities such as data analytics tools, systems and skilled IT employees to manage information enables organizations to effectively manage and use the analyzed data to make informed decisions thus leading to improved efficiency and reduce costs (Berdik et al., 2021).

### 5.3.1 The relationship between knowledge management and information management capability.

The results show a positive and significant relationship between knowledge management and information management capability. This implies that health care projects that enhanced their knowledge management abilities have a possibility of enhancing their information management capability. This finding relates to the study by Szymkowiak et al., (2021) who contend that organizational knowledge processes work closely with information management tools in order to distribute structural knowledge vertically and horizontally, this helps to act in response to market-related changes (Bajgoric et al., 2022). Also, Panda & Rath (2021) asserted that through knowledge management (KM) capabilities, organisations are able to improve on their agility through information management. This finding also resonates with the studies by Baharuddin (2020) who revealed that knowledge usage and dissemination plays an important role in improving information quality through identifying, assimilating and usage of knowledge which in turn improves organizational records management.

### 5.3.2 The combined effect of IT capabilities and Knowledge management on information management capability.

The results from the regression model show that IT capabilities and knowledge management are significant predictors on information management capability among health care projects. This finding resonates with Ali et al., (2020) who found that IT capabilities can enhance group members' ability to share knowledge and this facilitates information sharing, usage and dissemination since data is readily available. Also, Wang et al., (2022) noted that IT capabilities enable organizations to capture, store, and process vast amounts of data, while knowledge management enables organizations to capture, share, and leverage tacit and explicit knowledge (Hedayati & Schniederjans, 2023). Thus, the combination of these capabilities can enhance an organization's

ability to manage information effectively. Similarly, in agreement with findings, Singh and Kant, (2017) also asserted that when firms embark on integration of IT capabilities and knowledge management improves information sharing, collaboration and knowledge creation which leads to better decision-making and improved organizational information management.

### 5.4 Conclusions

The purpose of this study was to establish the relationship between information technology capabilities, knowledge management and information management capability in health care projects in eastern Uganda from a resource-based view theoretical lens. An analysis of survey data collected from a sample of 86 health care projects in Eastern Uganda revealed that IT capabilities positively and significantly influences information management capability; Knowledge management having the strongest influence on information management capability and that IT capabilities and knowledge management combined are significant predictors on information management capability among health care projects.

Lastly, since IT capabilities and knowledge management significantly predicted information management capability, it can be concluded that health care projects in Uganda can improve their information management abilities through emphasizing their information technology capabilities and their knowledge management abilities.

### 5.5 Recommendations

In light of the study findings discussed in the previous section, the following recommendations are provided;

i. To practice; health care managers need to embrace IT capabilities in terms infrastructures, resources and relationship which can be implemented through motivating IT-related employees. thus, enabling them to be proactive in their work. Hence, eemployees who can skill fully use

IT/the IT system can be good at collecting information, eliminating outdated information and are more likely to enhance abilities information management

ii. Additionally, to practice, health care projects need to adhere to their knowledge management through clearly defining knowledge management processes and ensuring that shared meaning is achieved in communication and distribution of knowledge across the concerned project stakeholders.

iii. Lastly, Ministry of Health and implementing partners should build resources in terms of IT capabilities and knowledge since facilities that embark on integration of IT capabilities and knowledge management improve information collection, sharing, collaboration and knowledge creation which leads to better decision-making and improved project performance.

### 5.6 Limitations of the study and areas for further study.

i. The study used a cross sectional research design. Some of the study variables need to be studied over time due to their inherent behavioural elements. With cross-sectional data, there is a risk of analysing a temporary situation in the organisation and not its capability for improving information management abilities over time. Hence, future research that could, where possible, collect longitudinal data on the study variables.

ii. The study was only limited to health care projects in eastern Uganda in specifically districts of Mbale, Jinja and Iganga. Further research needs to be done in other geographical locations in Uganda and other developing economies to provide more generality of the findings.

iii. Lastly, study was also based on information technology capabilities, knowledge management and information management capability. There are other variables that affect information management capability such as financial muscle and role of regulatory practices among others which can be interesting for further research.

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**Appendix I Questionnaire**
**Dear Respondent**

I am pursuing a Master of Business Administration degree in Makerere University. As one of the requirements for completion, I am undertaking a study on **"IT Capabilities, knowledge management and information management capability of Health care projects in Eastern Region".** This study is purely for academic purposes and all your responses expressed herein will be kept with ultimate confidentiality. You are requested to feel free while filling this questionnaire presented to you. Thank you so much for your cooperation in advance.

**SECTION A; Background Information characteristics**

**Please tick appropriate box for the items below;**

1) **Respondent Characteristics**

a) **What is your age bracket?**

| <20 years | 20-25 | 26-30 | 31-35 | 36-40 | Above 40 |
|---|---|---|---|---|---|
| | | | | | |

b) **What is your highest level of education level?**

| Certificate | Diploma | Bachelor's degree | Master's degree | PhD |
|---|---|---|---|---|
| | | | | |

c) **For how long have worked for this project**

| 1-5 Years | 6-10 years | 11-15 years | 16-20 years | Over 20 years |
|---|---|---|---|---|
| | | | | |

d) **What is your position/ responsibility in this project?**

1. Project manager
2. District project coordinator
3. Project technical officers
4. Project M&E officers
5. District M&E officers
6. Medical officers
7. Project IT officers
8. District IT officers
9. Data assistants
10. Health information assistants
11. Others specify……

## 2) HEALTH CARE PROJECT CHARACTERISTICS

### a) How many years has this project been in existence?

| 1-2Years | 2-5 years | 5 years | Over 5 years |
|---|---|---|---|
| | | | |

### b) Nature of operation?

| Public | Private | Private-public partnership | Above site | At site |
|---|---|---|---|---|
| | | | | |

These following sections focus your responses towards the stated study statements and your response will be guided as below;

Strongly Disagree (SD) =1, Disagree (D) =2, Not sure (NS) =3, Agree (A) =4, strongly agree (SA) =5.

Please indicate by ticking in the appropriate box to what extent you agree/ disagree to the given statement below;

| **SECTION B: INFORMATION MANAGEMENT CAPABILITY** | | **Strongly Disagree** | **Disagree** | **Not Sure** | **Agree** | **Strongly Agree** |
|---|---|---|---|---|---|---|
| **CI** | **Collecting information** | **1** | **2** | **3** | **4** | **5** |
| **CI1** | You fully understand what information you are responsible to collect. | **1** | **2** | **3** | **4** | **5** |
| **CI2** | You ensure that information is accurately collected. | **1** | **2** | **3** | **4** | **5** |
| **CI3** | You gather the right information to prevent overload. | **1** | **2** | **3** | **4** | **5** |
| **OI** | **Organizing information** | | | | | |
| **OI1** | It is relatively easy to find files you need to do work. | **1** | **2** | **3** | **4** | **5** |
| **OI2** | You really do good job organizing information so that it is useful across different facilitates or divisions | **1** | **2** | **3** | **4** | **5** |
| **OI1** | You are encouraged or rewarded by management for organizing information so it is useful to others and me | **1** | **2** | **3** | **4** | **5** |
| **PI** | **Processing information** | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **PI1** | You are good at processing information from many different sources to make the best decision or solve a problem | **1** | **2** | **3** | **4** | **5** |
| **PI2** | You always structure decision-making to make use of the best possible information available | **1** | **2** | **3** | **4** | **5** |
| **MI** | **Maintaining information** | | | | | |
| **MI1** | Your job responsibility requires that you eliminate outdated information. | **1** | **2** | **3** | **4** | **5** |
| **MI2** | When the situation arises, you immediately update old information and documents to make them current. | **1** | **2** | **3** | **4** | **5** |
| **M3** | Your routine work helps you avoid collecting of the same information over again. | **1** | **2** | **3** | **4** | **5** |

*Adopted from Kettinger et al.,& Brinkhues et al (2015)*

| | **SECTION C: INFORMATION TECHNOLOGY CAPABILITIES** | **Strongly Disagree** | **Disagree** | **Not Sure** | **Agree** | **Strongly Agree (5)** |
|---|---|---|---|---|---|---|
| **IT** | **IT Infrastructure** | | | | | |
| **ITI1** | The data management services and architectures in my organization are adequate. | **1** | **2** | **3** | **4** | **5** |
| **ITI2** | The network communication is sufficient with good connectivity, reliability, and availability | **1** | **2** | **3** | **4** | **5** |
| **ITI3** | The quality of IT application and services (e.g., ERP ) can meet the organizational needs | **1** | **2** | **3** | **4** | **5** |
| **ITI4** | IT management services can coordinate the physical infrastructure and manage its relationship with business units effectively and efficiently. | **1** | **2** | **3** | **4** | **5** |
| **ITH** | **IT Human Resource** | | | | | |
| **ITH1** | organization has an adequate IT skill base. | **1** | **2** | **3** | **4** | **5** |
| **ITH2** | organization has skilled technical support staff. | **1** | **2** | **3** | **4** | **5** |
| **ITH3** | The staff in the organization knows how to solve problems related to IT. | **1** | **2** | **3** | **4** | **5** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **ITH4** | The IT groups are knowledgeable in business strategies for IT planning. | **1** | **2** | **3** | **4** | **5** |
| **ITH5** | The staff in my organization can evaluate and control IT projects. | **1** | **2** | **3** | **4** | **5** |
| **ITR** | **IT Relationship Resource** | | | | | |
| **ITR1** | organization has technology-based links with clients | **1** | **2** | **3** | **4** | **5** |
| **ITR2** | organization has technology-based links with suppliers | **1** | **2** | **3** | **4** | **5** |
| **ITR3** | We have a good line management sponsorship of IT initiatives. | **1** | **2** | **3** | **4** | **5** |
| **ITR4** | My organization has a good relationship between line management and IT service providers | **1** | **2** | **3** | **4** | **5** |
| **RC** | **Resource Commitment** | | | | | |
| **RC1** | My organization exerts considerable effort in improving information systems. | **1** | **2** | **3** | **4** | **5** |
| **RC2** | My organization exerts considerable effort in improving IT and its application to business operations. | **1** | **2** | **3** | **4** | **5** |
| **RC3** | My organization exerts considerable effort in improving the IT skills of employees through training. | **1** | **2** | **3** | **4** | **5** |

*Adopted from Mao et al., (2016)*

| | **SECTION D: KNOWLEDGE MANAGEMENT** | **Strongly Disagree** | **Disagree** | **Not Sure** | **Agree** | **Strongly Agree (5)** |
|---|---|---|---|---|---|---|
| **KA** | **Knowledge acquisition** | | | | | |
| **KA1** | You meet regularly to find out what services we need in the future. | **1** | **2** | **3** | **4** | **5** |
| **KA2** | You do a lot of in-house research on services we may need. | **1** | **2** | **3** | **4** | **5** |
| **KA3** | You are fast to detect changes in our services preferences. | **1** | **2** | **3** | **4** | **5** |
| **KA4** | You poll participants once a year to assess the quality of our services. | **1** | **2** | **3** | **4** | **5** |
| **ID** | **Information distribution** | | | | | |
| **ID1** | You frequently have interdepartmental meetings to discuss trends in service management. | **1** | **2** | **3** | **4** | **5** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **ID2** | You spend time discussing future service management needs | **1** | **2** | **3** | **4** | **5** |
| **ID3** | You immediately know when something important happens in your service management process | **1** | **2** | **3** | **4** | **5** |
| **ID4** | You share data on participants satisfaction in the service management process on a regular basis | **1** | **2** | **3** | **4** | **5** |
| **ID5** | You alert participants when something important happens in the service management process. | **1** | **2** | **3** | **4** | **5** |
| **SM** | **Share meaning** | | | | | |
| **SM1** | You ensure that shared meaning is achieved in your communication with others | **1** | **2** | **3** | **4** | **5** |
| **SM2** | You measure the success of achieving shared meaning in communication | **1** | **2** | **3** | **4** | **5** |
| **SM3** | You ever experienced miscommunication due to a lack of shared meaning | **1** | **2** | **3** | **4** | **5** |
| **SM4** | Organization accounts for cultural or language differences in communication to ensure shared meaning | **1** | **2** | **3** | **4** | **5** |

*Adapted from Hult et al., (2007); & Colomo-Palacios, R. (2014)*