UGANDA MANAGEMENT INSTITUTE

FACTORS AFFECTING THE IMPLEMENTATION OF AN INTEGRATED WATER MANAGEMENT INFORMATION SYSTEM AT MINISTRY OF WATER AND ENVIRONMENT, UGANDA

BY

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DECLARATION

I, Loy Asiimwe, declare that this dissertation is original and has not been submitted to any University or Institution of higher learning for any award.

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APPROVAL

This dissertation has been submitted for examination with our approval as the Institute supervisors.

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Date……

DEDICATION

This work is dedicated to my parents; Mr. and Mrs. Kapimpina, my siblings; Aarone Kwesiga, Vernita Kamukama and Brenda Kajumba, and my child Timothy Atugonza.

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My sincere thanks go to my supervisors Dr. Gerald Karyeija and Ms. Jennifer Rose Aduwo for guiding me through this research study. My appreciation goes to the management of the Directorate of Water Development- Ministry of Water and Environment too, for granting me an opportunity to undertake this program and carry out my study within the DWD. All your contributions made this work a reality.

May the Almighty God reward them in abundance.

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ACRONYMS & ABBREVIATIONS

DSS : Decision Support System

D.V : Dependent Variables

DWA : Department of Water Affairs

DWD : Directorate of Water Development

DWOs : District Water Officers

ICT : Information Communication Technology

IMIS : Integrated Management Information System

I.V : Independent Variables

IWMIS: Integrated Water Management Information System

MIS : Management Information Systems

WSDB : Water Supply Data Base

MWE : Ministry of Water and Environment

ABSTRACT

This study investigated factors affecting the implementation of an Integrated Water Management Information System in Ministry of Water and Environment. Factors affecting involved performance expectancy, effort expectancy and facilitating conditions which were the Independent Variables (IV) while Integrated Water Management Information System was the Dependent Variable (DV). The objectives of the study were: to investigate how performance expectancy affects the implementation of an integrated water management information system at Ministry of Water and Environment in Uganda, to establish how effort expectancy affects the implementation of an integrated water management information system at Ministry of Water and Environment in Uganda and to find out how facilitating conditions affect the implementation of an integrated water management information system of Ministry of water and environment in Uganda. The researcher used a cross sectional survey design and collected data from 104 respondents as the response rate. Both qualitative and quantitative techniques were used. The study revealed a positive relationship between performance expectancy and IWMIS with a standardized coefficient (B) of 0.73, implying an effect on IWMIS by73%. Nevertheless, facilitating conditions were found to have an impact on IWMIS as there is a challenge of equipment and associated with costs of maintenance of the equipment. It was found to have an Adjusted R square of 0.351, implying that it affects IWMS by 35.1%. It was concluded that performance expectancy, effort expectancy and facilitating conditions negatively affect the implementation of an IWMIS. It was recommended that management encourage employees to be creative to use innovations, give constant positive feedback to employees in order to adjust efforts and establishment of a structure that cuts across all the departments that will see a developing IWMIS.

CHAPTER ONE

INTRODUCTION

1.1. Introduction

In this 21st century, Management Information Systems have become part and parcel of all organizations in a bid to improve the quality of services to the users. Whether private or public, organizations must have Management Information Systems in order to cope well in this changing world of technology and in the effective delivery of services.

The Ministry of Water and Environment in Uganda had to adapt an Integrated Management Information System in a bid to effectively deliver services to the public as well as meet the millennium development goal, pillar 7 of reducing by half the percentage of population without access to clean water by 2015.

This chapter presents the historical background, theoretical background, conceptual background, contextual background, the problem statement, the conceptual framework, purpose of the study, objectives of the study, research questions, hypothesis, significance of the study, justification of the study, scope of the study and operational definitions of terms and concepts.

1.1.1 Historical Background

Today's information flow in a global economy requires in built systems for overall performance of any organization. Information is driving both daily operations and organizational long term strategies. Computer software and networks have helped

organizations to become flexible, separate work from location, improve efficiency and restructure work flow giving the powers to both the line workers and management. Use of data sources for both enterprise level planning and decision making has become increasingly important. Information sharing among organizations can help achieve important public benefits such as increased productivity, improved policy making and integrated public service.

Heavy investment in Information communication and technology by many organizations has been done but results reaped don't match the inputs, mainly due to poor information management systems. To maximize the advantages of Information communication and technologies, there is much need to plan for the whole information structural design of most organizations. Such a design needs to integrate all the management information systems (MIS) so that they operate in unison if they are to effectively support the organization goals and objectives.

Globally, in United Kingdom (UK), given the importance of information to the public sector, there is therefore clearly a need for it to be consistently and effectively managed, protected and exploited. For the first time, there is an overarching set of Information Principles for the UK public sector. The content described here forms a key element of the overarching Government ICT Blueprint. This blueprint was developed and managed using Enterprise Architecture based governance practices, which require that clearly defined principles are established and complied with. These principles are intended to express timeless truths to which all public sector organizations can subscribe, but also to provide, as a consequence, concrete implications for implementation. The principles are intended to be bold and challenging and to set direction. They are not however intended to be directives, and it is for

each organization to consider the principles and to set the extent of their own ambition, interpreting the implications in the light of their own unique organizational context. The principles provide high level guidance and therefore their scope is intentionally broad. They apply to all information that is created, collected, held, used, shared, transformed, published or processed by a UK public sector organization. They apply to both structured and unstructured information, and to information at all stages of its lifecycle. It is again for each organization to interpret the precise implications in the light of their own unique organizational context and information usage. As a result, the aim is to enable organizations across the public sector to become increasingly aligned in their use and management of information, drawing their own local strategy and practices from a common set of principles and best practices (HM Government 2011).

On the African continent, The Ghana Statistical Service (2010), Ghana has introduced a new system of accessing information either through the Internet or the Intranet. The Integrated Management Information System (IMIS) using REDATAM + SP has been applied with the help of UNFPA to come up with a very flexible system that enables every person to have access to Census and or Survey information over the net. The user can easily generate information in form of Frequencies, Cross Tabs, Indicators and get output either in form of Tables, Graphs or Maps or a combination of any two or all the three options. By opening the main web page, the user will see options about the different Database Groups. Select the group of your interest and click the button. This will lead you to other sub databases that fall under the main database group selected. Select the sub database of your choice and continue to the detailed web page. The user will find different options such as Frequencies, Cross

Tabulations and Indicators. By selecting any of them, you will open other pages on which you will find selection boxes for variables that will enable you to generate the required information. On the same page you will find selection boxes for the output level, such as Region and District and also the type of output.

The National Water Act and the White Paper on National Water Policy require/provide for the development of various national water information systems to provide information for the sustainable and equitable management of water in South Africa. The disparate water information systems were historically developed to provide with water information to achieve unrelated objectives. Thus, these systems contain "silos" of data which are managed by different functional areas within the Department of Water Affairs (DWA) and in various institutions of the water sector. A process to coordinate and integrate these systems to establish a National Integrated Water Management Information System (NIWMIS) has been initiated. In order for the Department of Water Affairs to better leverage the wealth of information being collected by various operational source of water information systems, a high priority initiative led by the Policy & Regulation (Water Resources Management) Branch was, during March 2011, launched to establish a NIWMIS. The entire project is envisaged to be delivered within 4½ years from the date of commencement. The project is divided into three major phases namely, Business Analysis Phase, Prototype Design Phase and NIWIS Full System Design Phase. The Business Requirements Specification document, which marked the closure of this first project phase, is together with other related documents already obtainable on request, from DWA. The DWA establishes various national water information systems to address the management, use, development, conservation, protection

and control of South African waters in a most possible sustainable and equitable manner. Various water information systems were and are still being developed, with the aim of providing meaningful information to water practitioners and managers. However with established systems, a new data landscape has emerged in the DWA reflecting numerous "islands" or "silos" of data by functional area. Sources of data and information are often not known due to dispersal and disintegration of systems throughout the DWA business units. Information stored in different sources and formats not only hinders decision support but also deters improvement in service delivery (Nungu et al, 2012).

1.1.2 Theoretical background

The Unified Theory of Acceptance & Use of Technology (UTAUT)

UTAUT proposed by Venkatesh et al. (2003) contains four core determinants of intention and usage- performance expectancy, effort expectancy, social influence and facilitating conditions.

Performance expectancy is defined as "the degree to which an individual believes that using the system will help him or her attain gains in job performance" (Venkatesh et al., 2003).End users are more concerned with whether a system can help them their daily job routines. This is normally subjective as user perception of performance gain is unique to a person.

Effort expectancy is defined as "the degree of ease associated with the use of the system" (Venkatesh et al., 2003). Effort expectancy is derived from the perceived ease of use

constructed proposed by Davis's 1989 TAM model. Venkatesh et al., (2003) found that effort expectancy determined end-users' intention to use an information system.

Social influence is defined as the degree to which an individual perceives that it is important others believe he or she should use the new system. Social influence as a direct determinant of behavioural intention is represented as subjective norm in Fishbein and Ajzen's (1975) theory of reasoned action (TRA). Venkatesh et al (2003) found that there is a strong relation between a user's reaction to information technology and the attitude and behaviours of other people within the users social and work environment. This is because at inception of new information systems, users are unsure how to act; in the process, users will make decisions based on how existing social circles are behaving.

According to Venkatesh et al, (2003), social influence has three constructs – subjective norms, social factors and image. The study found when system usage was voluntary; the influence of these constructs was not significant. However, when system usage was enforced, the influence of these constructs was significant (Venkatesh et al, 2003). This could in part be explained by compliance to laid out institutional norms, whereby the need to comply leads social influence to have a direct influence on system usage. In contrast, whenever system usage is voluntary, the usage is determined by how a user perceives the technology will improve his or her social standing (Venkatesh et al, 2003).

Facilitating conditions are defined as the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system (Venkatesh et al., 2003). Facilitating conditions represents organizational and technical support and is

typically significant in the initial usage period. Facilitating conditions are non-significant in predicting intention (Venkatesh et al. 2003).

Three constructs contribute to facilitating conditions: training and support, belief in the system and project communication.

Training has been found to have a significant influence especially during the implementation of an information system, such as a MIS. It is important to get the correct length, time and depth of training prior to implementing a MIS. This would give a positive influence on the user acceptance of the system and give users time to adjust to the change that occurs when the MIS is to be used as part of the daily routines. In addition, providing adequate support to users allows them to gain experience and comfort with the system, and will enable end-users appreciate the system as they better understand how the system simplifies the daily job routines.

Shared belief is the user belief that the system will have an overall positive effect on the organization. As users usually come from different functional and management levels in an organization, information systems such as MIS, have to be designed with these functions in mind. Users at all functional and management levels need to believe the MIS will bring positive impacts to the entire organizations in order to get buy-in from the users. The belief in a system may influence the users' attitude towards the information system and its use.

Communication about the MIS is vital because it provides information about the new information system and enables users provide feedback about issues they face during system usage. By identifying these issues early on, an organization can fix them and reduce the likelihood of rejection of the MIS. In addition, communication about the benefits of the

system will increase the shared belief within an organization. Users would feel a sense of ownership and involvement in the decision making process.

Venkatesh et al. (2003) emphasizes on adoption and utilization of technology among which Information Communication Technology lies. This is highly in line with behavioural change where by issues like individual beliefs, and behavioural intention are brought about as determinants people express when exposed to an innovation. This led to the adaption of: performance expectancy, effort expectancy and facilitating conditions as spelt out in the Unified Theory of Acceptance & Use of Technology to guide the study through provision of the identified variables which included performance expectancy, effort expectancy and facilitating conditions.

1.1.3 Conceptual Background

The study focused on two broad concepts; "factors affecting" and the "national integrated water management information systems." The two constituted the independent variables (I.V) and the Dependent Variables (D.V) respectively. The Independent variables included: performance expectancy, effort expectancy and facilitating conditions.

Performance expectancy was conceptualized as the way individuals within MWE believe that using a national integrated water management information system will help them attain better results alongside other stakeholders who utilize the work of the ministry (Venkatesh et al, 2003).

Effort expectancy was conceptualised as the extent to which the system is easy to be used by individuals and determined by end-users' intention to use an information system (Venkatesh et al, 2003).

Social influence is the extent to which an individual perceives that it is important others believe that one should use the new system. Social influence as a direct determinant of behavioural intention is represented as subjective norm (Fishbein & Ajzen, 1975).

The national integrated water management information system will involve data processing, data storage, and data dissemination.

Data processing is a combination of machines and people that for a set of inputs produces a defined set of outputs. The inputs and outputs are interpreted as data, facts, information, depending on the interpreter's relation to the system. Data storage can refer to: Computer data storage; memory, components, devices and media that retain digital computer data used for computing for some interval of time. Any data storage device; that records (stores) or retrieves (reads) information (data) from any medium, including the medium itself. Data dissemination means the release of data obtained from a statistical activity to users through various media. For each data release there is also a need to effectively communicate the data to data users and a requirement to make known the availability of the release. Data dissemination is the process of transfer of data between users.

1.1.4 Contextual Background

The Ministry of Water and Environment; specifically the Directorate of Water Development has an information tracking system which is semi-autonomous to each department, (SPR

MWE, 2010). Coordination between the different departments in terms of how they collect data and how it's all integrated into the various ministry databases or how they use this scattered information from different departments to compile reports especially the annual Sector Performance Reports in the ministry is still a major challenge. Thus there is need for one central system that can be used to compile data in a comprehensive way, rather than have scattered means of collecting it using the different department systems that have their own problems and are not interlinked. As noted by James Robertson (2005) projects have a poor track record of success, and most organizations are still struggling to deliver an integrated information management environment; this is also a real factor facing MWE as the ministry does not have an Integrated Management Information system (MWE, Sector Performance Report, 2011).

1.2 Statement of the problem

Over the past decade, MWE through the Directorate of Water Development (DWD) has undertaken several initiatives to improve information management related to water supply and sanitation. Currently, two activities are in progress: Revitalization of Water Supply and Sanitation Management Information System (WSS-MIS) which involves assessing constraints, redefining the vision and strengthening capacity for data management in the sector. Since FY 2007/8 the focus has been on sub-sector specific databases. In this regard MWE has improved the information flow between Local and Central Governments through a revised reporting system for the DWSCDG. Data collection, validation and dissemination strategies have been formulated for water supplies. The 2006 Joint Sector Review (JSR) resolved to "Revise sector performance measurement framework, the criteria and the way it defines, establishes, validates and harmonizes information regarding access to and use of

safe water and sanitation in Uganda" as one of its undertakings. This has been undertaken over the last two years and has resulted in new definitions and calculation methods for five of the Golden Indicators (Ministry of water and Environment- National Framework for Operation & Maintenance of Rural Water Supplies in Uganda, 2011).

The District MIS is based on information collected by the District Water Officers (DWOs) and stored in the ministry's Water Supply Data Base (WSDB). The DWO collects the information for the MIS through Form 1, 2 and Form 4. Form 1 is for new water sources or sources not yet stored in the WSDB, while Form 4 is for marking changes in the status of functionality, management and gender; while Form 2 is for piped water supply systems (Ministry of Water and Environment- District Implementation Manual, 2013). Given the above scenario, it indicates that the integrated management information system (IMIS) is still underdeveloped as it first focused on MIS revitalization that has not fully taken off and use of manual methods that are problematic. These called for this study so that information can be availed to find out where the challenge is that hinder the development of IWMIS for MWE and suggest possible solutions.

1.3 Purpose of the study

The purpose of the study was to investigate the factors influencing the implementation of the integrated water management information system at MWE.

1.4 Objectives of the study

I. To investigate how performance expectancy affects the implementation of an integrated water management information system at MWE.

II. To establish how effort expectancy affects the implementation of an integrated water management information system at MWE.

III. To find out how facilitating conditions affect the implementation of an integrated water management information system at MWE.

1.5 Research questions

I. How does performance expectancy affect the implementation of an integrated water management information system of ministry at MWE?

II. How does effort expectancy affect the implementation of an integrated water management information system at MWE?

III. What effect does facilitating conditions have on the implementation of an integrated water management information system at MWE?

1.6 Hypotheses of the study

I. Performance expectancy has a significant effect on the implementation of an integrated water management information system at Ministry of Water and Environment in Uganda.

II. Effort expectancy has no significant effect on the implementation of an integrated water management information system at Ministry of Water and Environment in Uganda.

III. Facilitating conditions significantly affect the implementation of an integrated water management information system of Ministry of water and environment in Uganda.

1.7 Conceptual Framework

The conceptual framework is the diagrammatic presentation that shows the relationship between factors affecting which are the independent variables and integrated water management information system which is the dependent variable and is presented in Fig. 1 below.

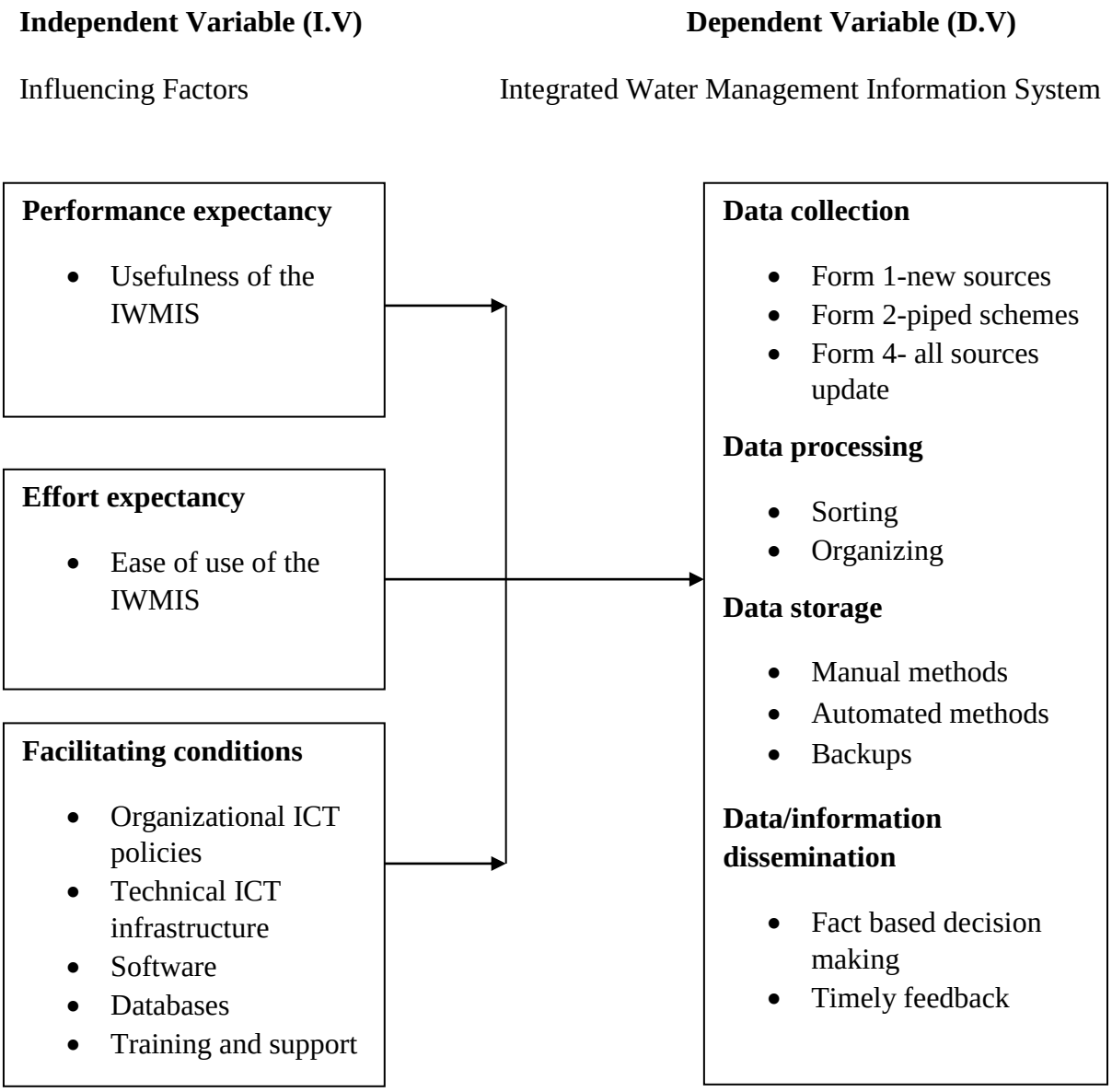

Fig. 1. The conceptual framework

Source: The conceptual framework as adapted from Venkatesh et al, (2003) and modified by the researcher.

In the above framework, the independent variables (IV) performance expectancy, effort expectancy and facilitating conditions which may either work in isolation or in unison to affect the dependent variable (DV) which is the integrated water management information system. The

study found out the factors; which included performance expectancy, effort expectancy and facilitating conditions and how they affect the implementation of the national integrated water management information system in Ministry of Water and Environment of Uganda.

1.8 Significance of the study

The study findings contribute to the solutions towards Integrated Water Management Information Systems in the Ministry of Water and Environment. The study findings add on the existing body of knowledge relating to knowledge management and organizational effectiveness as well as being a basis for calling for further research by academics. The study findings also inform policy makers and policy advocates in designing and reviewing policies that can improve on the contribution of MIS departments in Uganda.

1.9 Justification of the study

Integrated Water Management Information System is an important tool in all sectors of an economy. This is so because it creates automation of work which leads to efficiency and effectiveness hence cost effectiveness.

1.10 Scope of the study

1.10.1 Geographical scope

The study was limited to Directorate of Water Development within the Ministry of Water and Environment of Uganda, which is located in Luzira in the out skirts of Kampala.

1.10.2 Time scope

The study was limited from the time of 2006 to 2015. This is the period when the latest performance reports were made and the current MIS policies were revised /amended. In

2007/2008, MWE undertook initiatives to improve information management starting with assessing constraints, redefining the vision and strengthening capacity for data management in the sector (Ministry of water and Environment- National Framework for Operation & Maintenance of Rural Water Supplies in Uganda, 2011).

1.10.3 Content scope

The study mainly focused on the factors influencing the implementation of the Integrated Water Management Information System. These factors included; usefulness of the IWMIS, ease of use of the IWMIS, Organizational ICT policies, technical ICT infrastructure, software, databases, training and support.

1.11 Operational definitions

Data **:** Data is distinct pieces of information, usually formatted in a special way.

Efficiency **:** Doing something or in producing a desired result in a more general sense; well, successfully, and without waste.

Information : Processed data that is accurate and timely, specific and organized for a purpose, presented within a context that gives it meaning and relevance, and can lead to an increase in understanding and decrease in uncertainty.

Management Information Systems: An organized way of capturing data, processing it, storing, retrieving and sharing it in a more efficient way.

Policies **:** Guidelines in place that provide direction on accomplishing a given role.

Processing **:** Organizing data into meaningful information.

Reporting **:** Presenting required information to the right end user in the required time and place.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of literature on different aspects of challenges of MIS in the DWD Ministry of Water and Environment. The researcher reviewed a selection of literature as presented in the text books, journals, magazines, internet and articles on Management Information Systems with focus to Directorate of Water Development (DWD). This Chapter is arranged under theoretical review, actual literature review done on objective by objective and a summary of the literature.

2.2 Theoretical Review

Innovation Diffusion (Diffusion of Innovation) Theory (IDT)

Rogers (1995) defined Diffusion of Innovation Theory as "the process by which an innovation is communicated through certain channels over time among the members of a social system."

Individuals are seen as possessing different degrees of willingness to adopt innovations and thus it is generally observed that the portion of the population adopting an innovation is approximately normally distributed over time (Rogers, 1995).

The IDT has been extended to information system research. Moore and Benbasat (1991), expanded upon the five factors impacting the adoption of innovations presented by Rogers,1995, generating eight factors namely voluntariness, relative advantage,

compatibility, image, ease of use, result demonstrability, visibility, and Trial ability that impact the adoption of information systems.

Brent Furneaux of the University of York, (www.fsc.yorku.ca) states IDT has been applied in numerous ways, however research has, consistently found that technical compatibility (facilitating conditions), technical complexity(ease of use), and relative advantage (perceived need) are important antecedents to the adoption of innovations according to Bradford and Florin, 2003 and Crum et. al (1996).

2.3 Performance expectancy and the implementation of national water integrated management information system.

Whenever an individual chooses between alternatives that involve uncertain outcomes, it seems clear that his/her behaviour is affected not only by his preferences among these outcomes but also by the degree to which he/she believes these out comes to be probable(Vroom, 1964 as cited by Grant & Shin, 2011).

An individual makes choices based on estimates of how well the expected results of a given behavior are going to match up with or eventually lead to the desired results. Motivation is a product of the individual's expectancy that a certain effort will lead to the intended performance, the instrumentality of this performance to achieving a certain result, and the desirability of this result for the individual, known as valence (Condrey, 2005).

Individuals can be motivated towards goals if they believe that there is a positive correlation between efforts and performance, the outcome of a favourable performance

will result in a desirable reward, a reward from a performance will satisfy an important need, and/or the outcome satisfies their need enough to make the effort worthwhile (Subba, 2000). Instrumentality a person receives a reward if the performance expectation is met. This reward may present itself in the form of a pay increase, promotion, recognition or sense of accomplishment. Another way that instrumental outcomes work is commissions. With commissions performance is directly correlated with outcome (how much money is made). If performance is high and many goods are sold the more money the person will make. Factors associated with the individual's instrumentality for outcomes are trust, control and policies. Trusting the people who will decide who gets what outcome, based on the performance. Control of how the decision is made, of who gets what outcome. Policies go with understanding of the correlation between performance and outcomes (Subba, 2000).

According to Holdford and Lovelace-Elmore (2001, p. 8), in order to enhance the performance-outcome tie, managers should use systems that tie rewards very closely to performance. Managers also need to ensure that the rewards provided are deserved and wanted by the recipients. In order to improve the effort-performance tie, managers should engage in training to improve their capabilities and improve their belief that added effort will in fact lead to better performance.

Stone, R. W. & Henry, J. W. (1998) conducted an empirical study on 154 faculty members' behavioural intentions/responses to use of new software. The antecedents with previous computer experience ease of the system and administrator support for they are linked to behavioural intentions to use the software through self-efficacy and outcome

expectancy. Employees will accept technology if they believe the technology is a benefit to them. If an employee is mandated to use the technology, the employees will use it but may feel it is not useful. On the other hand, when an employee is not mandated, the employee may be influenced by other factors that it should be used.

The self-efficacy theory can be applied to predicting and perceiving an employee's belief for computer use (Bandura, 1986; Bates & Khasawneh, 2007). This theory associates an individual's cognitive state affective behavioural outcomes (Staples, Hulland, & Higgins, 1998). Motivation, performance, and feelings of failure are examples of self-efficacy theory expectations. The following constructs of the self-efficacy theory that impact attitudes and intentions to perform: past experience or mastery with the task, vicarious experience performing the task, emotional or physiological arousal regarding the task, and social persuasion to perform the task.

The concepts identified in performance expectancy statements as put across by different scholars and theorists were broken down to guide the study on whether they are applicable and relevant to MWE. These formed the guidelines to approaches towards issues raised in the study to investigate their contributions towards the implementation of the IWMIS at MWE. Some of the identified concepts include among others; belief in outcomes before utilization, expectation/estimation of results, and rewards provided in order to be motivated to use an innovation. The results realised from these concepts are presented and discussed in chapter four and five.

2.4 Effort expectancy and the implementation of national water integrated management information system.

Effort is encouraging the belief that making more effort will improve performance. If people expect a positive and desirable outcome, they will usually work hard to perform at the level expected of them.

Employees choose to invest effort in courses of action by weighing their relative utilities- i.e., their probabilities of achieving desired outcomes (Vroom, 1964). Effort is a function of three beliefs: expectancy (effort will lead to performance), instrumentality (performance will lead to outcomes), and valence (these outcomes are important or valued). These beliefs are thought to interactively influence effort, such that if any one of the beliefs is missing, the course of action will not be selected (Porter & Lawler, 1968). Without expectancy beliefs, employees feel that effort is futile; without instrumentality and valence beliefs, employees question whether performance is worth the effort. Critically, expectancy theory is designed to account for the within-person decisions that employees make about whether, where, and how to invest their time and energy, rather than for differences in effort between employees. Difficult, specific goals are most likely to produce these effects when employees are committed to them, when they receive feedback, and when tasks are simple rather than complex. Without commitment, employees question whether it is worthwhile to work toward difficult goals. Without feedback, employees cannot gauge their progress and adjust effort, persistence, and task strategies accordingly. When tasks are simple, effort is a key determinant of performance, but when tasks are complex, ability and task strategies become more influential (Porter & Lawler, 1968).

Easy goals yield greater effort-to-performance expectancy beliefs, and thus greater motivation and performance, than difficult goals. This tension by showing that when goal difficulty is held constant, higher expectancy beliefs are associated with higher performance, but when goal difficulty varies, more difficult goals are linked with higher performance, as the attention, effort, persistence, and task strategy benefits of difficult goals appear to outweigh the costs of lower expectancy beliefs (Locke, Motowidlo, & Bobko, 1986). Furthermore, expectancy beliefs moderate the effects of goal difficulty on performance, such that setting difficult goals only motivates employees to take action if they believe such action has the potential to achieve the goals (Locke & Latham, 2009).

According to Ashford et al. (1998); Mitchell & Daniels (2003); Staw (1984), effort creates a picture of how employees actually make decisions and experience motivation. With the possible exceptions of mathematicians, engineers, financial analysts, and economists, rarely employee are seen sit down and calculate the probabilities of effort leading to performance and performance leading to outcomes, and the utility of these outcomes. It would be even more uncommon for an employee to perform these calculations for multiple possible courses of action.

Employees can attach valence not only to outcomes of performance, but also to effort and performance as ends in and of themselves. Eisenberger's (1992) explained how, when employees are rewarded for effort over time, hard work can take on secondary reward properties, such that employees naturally enjoy the very experiencing of expending effort. In addition, employees tend to view performance as a reward in and of itself when they are growth-oriented (Hackman & Oldham, 1976), conscientious (Grant, 2008b), and

achievement-motivated (McClelland, 1961), suggesting that they will place valence on performance even when there are no external outcomes attached to it.

Previous scholars' work was revised in relation to effort expectancy and implementation of an innovation. This formed a platform on where an establishment towards the how the raised concepts by different scholars stated above is reflected at MWE as far as implementation of an IWMIS is concerned. Some of the identified concepts as revised from the previous scholars that formed a basis for the study to establish how effort expectancy affects the implementation of an IWMIS at MWE included; expectant of desirable out comes from an innovation, weighing of the would be required efforts to utilize an innovation, realization of rather difficult goals and rewards.

2.5 Facilitating conditions and the implementation of a national integrated management information system.

Facilitating conditions are defined as the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system (Venkatesh et al., 2003:453).

Davis (1989) found a widespread use in the information systems field. He modelled the effect of perceived usefulness (PU) and perceived ease of use (PEU) of information technology on each other, and on actual usage through intention to use. Venkatesh and Davis (2000) showed that PU was also affected by the social influence processes (subjective norm, image and voluntariness), by job relevance, output quality and result demonstrability, and to some extent by experience as a moderating variable. Venkatesh (2000) examined a number of "anchors and adjustments" as determinants of PEU.

Mathieson, et al (2001) developed Perceived Resources available as hardware, software, knowledge, time, data, finance, support and documentation as facilitating conditions to the utilization of an information system.

Power (2003) noted that a brief definition of a decision support system (DSS) is difficult to locate. DSS is a general term encompassing a wide set of converging technologies which aim to provide integrated support for managers working alone, in teams and in organization hierarchies to manage organizations and make more rational decisions (Power, 2003). Mann and Watson (1993) state: "A decision support system is an interactive system that provides the user with easy access to decision models and data in order to support semi-structured and unstructured decision-making tasks." Power (2003) identifies five categories of DSS applications: communications-driven DSS, data driven DSS, document-driven DSS, knowledge-driven DSS and model-driven DSS. A decision support system thus covers a large variety of both software and terminology. Included in this arena can be spreadsheet programs, business intelligence, on-line analytic processing (OLAP), data mining, executive information systems (EIS), management information systems, data warehousing technology, query and reporting systems. Other DSS characteristics include (Sprague and Watson, 1993; Mallach, 1994; Sauter 1997): combining use of analytic techniques with data access and retrieval functions exhibiting flexibility and adaptability to accommodate changes in the environment and the decision making approach of the user assisting, not replacing, the decision making process and responsiveness in terms of speed and access to information utilizing multiple data sources.

Turban and Aronson (2001) include the following under the umbrella term of Management Support Systems: DSS, group support systems, enterprise (executive) information systems, ERP and SCM, knowledge management systems, expert systems, artificial neural networks, hybrid support systems and intelligent DSS. The term "business intelligence" is however currently used more widely in industry than DSS, focusing mainly on OLAP, data mining, business performance management and data warehousing technologies. This coincides largely with Power's (2003) data-driven DSS. There is clearly a lack of uniformity in terminology used, which differs over time, and between academia and industry.

Literature by different scholars was revised about facilitating conditions towards the support for the implementation of an innovation. Some of the concepts that were identified in the literature include; organizational policies, laid down structures in an organization, presence of software programs, availability of databases, training and empowerment and overall support provided to employees to utilize innovations. These formed a ground on which the study based to find out how these facilitating conditions' presence in MWE and how they affect the implementation of an IWMIS as presented and discussed in chapters four and five.

2.6 Summary of Literature Review

The literature revised focused on performance, effort and facilitating conditions on the implementation of an integrated management information system. However, it is too abstract. It shows how they contribute or guide in the utilization of an information system there is no specific study that targets the implementation of an integrated information

system in Uganda particularly the ministry of water and environment in Uganda. This is a clear indication that the implementation of an integrated water information management system was a virgin area which needed to be filled.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter presents the information concerning the methodology to be used in this study. It presents the research design, study population, area of study, sample size determination & sampling techniques, data collection methods and instruments, data collection procedures, data analysis and measurement of variables.

3.2 Research Design

This study used a cross sectional survey design. The researcher used this design because it is relatively inexpensive, takes a short period of time to conduct and data can be collected only once (Sekaran, 2003). The researcher employed both qualitative and quantitative approaches to investigate the factors influencing the implementation of the national integrated water management information system in DWD. According to Denscombe (1998) a triangulation of methods of data collection enhances the reliability of the data for investigation of research problems. This study will therefore use a triangulation of methods.

3.3 Study Population

This study was carried out in Directorate of Water Development with a population of 153 staff comprising of 1Director, 4 Commissioners, 8 Assistant Commissioners, 10 principle engineers, 15 senior engineers, 41engineers and 74 other workers within the department who include line managers and sociologists.

3.4 Sample size

The sample size for this study was determined using the Krejcie and Morgan (1970) sample size determination table. The sample was drawn using stratified random sampling to ensure that the interests of the population are represented. The strata included commissioners, assistant commissioners, principle engineers, senior engineers, line managers and sociologists. Purposive sampling was used for the selection of Commissioners and Assistant Commissioners. These were the key informants who are knowledgeable and believed to have relevant information needed in this study. Simple random sampling was used to select the rest of the respondents from Principle engineers to sociologists. This is due to the larger size of the respondents and it helped to avoid possible biases of the researcher in selecting the respondents.

Table 1: Research respondents by category and sample

Category	**Population**	**Sample**	**Sampling technique**
Director	1	1	Purposive
Commissioners	4	4	Purposive
Assistant Commissioners	8	8	Purposive
Principle Engineers	10	10	Simple random
Senior Engineers	15	14	Simple random
Engineers	41	36	Simple random
Managers & Sociologists	74	59	Simple random
Total	153	132	

Source: The New MWE Structure (2012)

3.5 Sampling Techniques and procedures

The sample to be used for the study was derived using stratified random sampling for the employees to ensure that the interests of the population are represented in the sample to enable valid generalizations (Amin 2005). The different strata included the Director, Commissioners, Assistant Commissioners, Principle engineers, Senior engineers, Engineers, Managers and Sociologists. Commissioners and Assistant Commissioners were selected purposively subject to availability. All other categories were chosen using simple random sampling to allow for equal opportunities for any member to participate hence making generalizations of findings possible. A list of all staff was obtained from the Human Resource office which will constitute the sampling framework. Then each member was assigned a number which was written on a small piece of paper, put into a container, shaken and a second party requested to pick a paper without replacing it until the sample size quota has been constituted.

3.6 Data Collection Methods

The researcher used multiple data collection methods so that validity of findings was assured. Primary data was collected using the questionnaire survey and interview methods and secondary data through documentary review method.

3.6.1 Questionnaire Survey

This method was used to collect primary data from about 132 respondents comprising of a Director, Commissioners, Assistant Commissioners, Principle engineers, Senior engineers, Engineers, Line managers and Sociologists in DWD. This method was

selected because it will allow the researcher to collect data systematically and address the research issues in a standardized and economical way. The method will also be used because it is easy to administer to such a large number of respondents in a short period of time. It is also flexible and can be used to collect data within a short time (Sekaran, 2003). Questions are also helpful in collecting sensitive information from respondents. Honesty and confidentiality can easily be achieved.

3.6.2 Interviews

Face to face interviews was used to supplement the questions. This method was used on about 13 senior management staff of DWD comprising of Commissioners and Assistant Commissioners. These were key respondents in this study because they are expected to be more knowledgeable and provide insight on the variables. Mugenda and Mugenda (1999) states that interviews provide in depth data which is not possible to get using questions and the beauty about it is that interviews can take advantage of the interactive situation to get further information or clarification on responses given thereby enriching the findings. This method allowed for an in-depth assessment and critical analysis of the subject. Interviews were carried out by the researcher herself to save on time and costs, but also to allow for an in-depth study and clarification on issues hence enriching the findings.

3.6.3 Documentary Review

This method involved the researcher looking at written sources of data such as books, reports, plans, journals and other official company records like statistics (Denscombe,

2000). The researcher reviewed documents and extract data to supplement questions and interviews hence enriching the findings. Some of the documents were reviewed which include annual ministerial reports and other publications on MWE in relation to information management. As other academicians have found out, the advantage with documentary review is that data can be verified by other scholars; saves time and costs of acquiring information(Sekaran, 2003) and is flexible since data can be accessed at any suitable times (Oso & Onen, 2009)

3.7 Data Collection Instruments

3.7.1 Questionnaire

The first research instrument that was used in this study is a structured questionnaire. The instrument was developed based on the constructs identified in the literature review. The questionnaire allowed the researcher to collect data systematically and address the research issues in the standardized and economical way as it is easier, cheaper to collect data from a large group of respondents in a limited time. According to Mugenda and Mugenda (1999) structured or close ended questions are easier to analyze since they are in an immediate usable form. They are easier to administer as possible answers follow each item. Also this will be useful due to limited time and resources. Questions were scored on a five point likert scale ranging from 5-1 i.e. strongly agree-5, agree-4, not sure-3, disagree-2 and strongly disagree-1. The researcher administered some of the questionnaires by herself while the assistants will administer to others especially those who are very far geographically. The questionnaire was pre-tested in order to ensure reliability and validity and to be able to build confidence that the instruments yielded good results.

3.7.2 Interview Guide

The researcher used interview guide especially in collecting data from DWD senior management staff. The researcher developed the interview guide based on the constructs identified in the literature review. The guide assisted the researcher to remain on track while conducting the interviews. Interviews with DWD senior management staff were conducted by the researcher herself to allow the respondent a free associative environment.

3.7.3 Documentation Checklist

The researcher also used a documentary review checklist to guide the extraction of data that was relevant to this study. The researcher obtained data from reviewing records of the organization like corporate plans, reports, journals, work plans. These helped to give the vivid picture of the situation on the ground and help to cross check data collected through the primary sources.

3.8 Validity and Reliability

3.8.1 Validity

Validity refers to the appropriateness of the research instruments (Amin 2005). In this study, validity tests were carried out prior to the administration of these instruments. This was done to find out whether the questions will be capable of capturing the intended responses. The researcher consulted expert judgement in order to assess the content validity index (CVI) for each item using the SPSS program. For the instrument to be

acceptable as valid, CVI of at least 0.7 or above will be considered (Amin, 2005). Below is the CVI the statistics produced:

Table 2: Validity statistics

Validity Statistics

Validity	N of Items
.811	7

Source: Primary Data

The CVI was found to be at 0.811 which is over and above the requires 0.7

3.8.2 Reliability

Sekaran (2003) defines reliability as the measure of the degree to which a research instrument yields consistent results. It is an indicator of the suitability, repeatability and consistency with which the instrument measures concepts. The researcher conducted a pre-test of the instruments with 10 respondents within MWE to help uncover and identify the inconsistencies that were in turn corrected. The Cronbach Alpha coefficient was computed until at least the minimum reliability index of 0.7 is got which is always required (Amin, 2005) and is reflected below:

Table 3: The reliability statistics

Reliability Statistics

Cronbach's Alpha	N of Items
.846	9

Source: Primary Data

The Cronbach's Alpha stood at 0.846 which is over 0.7 that is recommended hence the tools used in the study were reliable.

3.9 Procedure of Data Collection

Upon approval of the proposal by Uganda Management Institute, the researcher obtained a letter of introduction. This was used to get permission to carry out research in DWD. The researcher proceeded to fine tune the instruments and test run them before administering them to the respondents.

The researcher went to the field to collect data on the study subject with the help of research assistants. Questionnaires were administered to respondents who were given a timeframe within which to complete and return them. The data collected was sorted, coded for analysis using SPSS computer package. The researcher intends to hold face to face interviews herself with senior management of DWD based on their conveniences. Appointment dates were set before proceeding to hold the interviews as agreed. After collecting data, the researcher then edited, analyzed and interpreted it for the findings.

3.10 Data Analysis

3.10.1 Quantitative Data Analysis

Upon completion of the data collection from the field the researcher proceeded to data analysis. All data was checked, edited, coded and entered into the computer for processing and analysis in order to make meaning out of it. All quantitative data consisting of numeric values was analysed using descriptive statistics and inferential statistics such as regression analysis especially when testing hypotheses and the

relationship between variables. Data was also exported to SPSS for final analysis and interpretation and was presented using figures and tables.

3.10.2 Qualitative Data Analysis

Qualitative data was analyzed systematically and thematically based on objective by objective of the study. The researcher categorised and summarised all the data collected for ease of analysis. During and after, the researcher recorded observations, made general summaries, coded the data where applicable and summarised data. Analysis involved identifying patterns, inconsistencies and relationships and reasons for their occurrences with the aim of explaining the challenges of the Integrated Management Information Systems in DWD. Using content analysis, data was critically studied, analysed and interpreted to generate meaning and conclusions made thereafter in line with the objectives of the study.

3.11 Measurements of Variables

For qualitative data, codes and labels were assigned to emerging themes, while for quantitative data; a likert scale was used to measure the variables. The variables were measured by a five point likert scale of 5-1 (i.e. strongly agree-5, agree-4, not sure-3, disagree-2, strongly disagree-1).

3.12 Ethical Considerations

3.12.1Consent

The respondents' consent was first sought before engaging them into any exercise of seeking information from them. This was done both verbally and written. Every respondent was at liberty to give information or not.

3.12.2 Privacy

Carrying out a study in most cases becomes a sensitive issue. This required privacy and confidentiality of the information given by the respondents. To ensure privacy, the respondents were informed that their names were not required. The respondents were not forced to give responses to the questions that were asked in the study as recommended by Mugenda and Mugenda (2003).

3.12.3 Confidentiality

To ensure more confidentiality, the respondents were informed that the information sought is for academic purposes and the data obtained would be treated with confidence as recommended by Amin (2005).

CHAPTER FOUR

PRESENTATION, ANALYSIS AND INTERPRETATION OF RESULTS

4.1 Introduction

This chapter presents analyses and interprets the study findings arising from the field information collected from respondents on factors affecting the implementation of an Integrated Management Information System in MWE.

4.2 Response rate

A total of 119 questionnaires were distributed and 92 were returned. 10 interviews were conducted from 13 key informants that included 1 Director, 4 commissioners, and 8 Assistant Commissioners. This put the overall response rate of 77.3% suggesting that the results contain substantial information and the survey results were representative of the population. The higher response rates also suggested a more accurate survey results (Weller & Romney, 1988).

4.3 Background characteristics of respondents

This section presents the characteristics of the respondents in relation to gender, education level, duration of work with MWE and the department they belonged.

4.3.1 Gender of the respondents.

The researcher was interested in the gender of the respondents. 33(35.9%) were males, 58(63.0%) were females, 1(1.1%) of the respondents didn't indicate the gender. This indicates that there was a fair distribution of both gender; males and females in the study. That percentage also came as a result of randomly selecting of the respondents and others could not return their questionnaires hence coming up with such an imbalance. Table 4below indicates the gender of the respondents.

Table 4: Gender of the Respondents

Gender of the respondents

		Frequency	Percent
	Male	33	35.9
	Female	58	63.0
	Total	91	98.9
	Non-response	1	1.1
Total		92	100.0

Source: Primary Data

4.3.2 Age groups of the respondents

Table 5: Age category of the respondents

Age category of respondents

	Frequency	Percent
20 - 29 years	35	38.0
30 - 39 years	31	33.7
40 - 49 years	19	20.7
50 - 59 years	6	6.5
60 years and above	1	1.1
Total	92	100.0

Source: Primary data

The researcher was interested in the age of the respondents and table 5 above reflects the findings. From table 5 above, 35(38.0%) of the respondents were 20-29 years, 31(33.7%) of the respondents were between 30-39 years, 19(20.7%) of the respondents were between 40-49 years,

6(6.5%) of the respondents were between 50-59 years and 1(1.1%) of the respondents was above 60 years of age. This implies that the information which was given was of quality as majority of the respondents were of mature age as 62% of the respondents were above 30 years of age that has high chances of responding with experience. In relation to the IWMIS, the majority of the respondents have operated in the generation of transformation from traditional/manual methods of approaching to work to automated methods of doing work. Therefore, they were in position to tell the different issues within the ministry that would affect the implementation of the IWMIS.

4.3.3 Education of the respondents

Table 6: Education of the respondents

Education of the respondents

		Frequency	Percent
Valid	Bachelor's degree	74	80.4
	Postgraduate level	16	17.4
	Total	90	97.8
Missing	Non-response	2	2.2
Total		92	100.0

Source: Primary data

From the table 6 above, 74 (80.4%) of the respondents possessed a bachelor's degree level, 16(17.4%) had a post-graduate and above level of education, 2 (2.2%) didn't indicate their level of education since they were not obliged to state it. However, the majority of the respondents of (97.8%) that indicated their education level possess a high level of education that is at a bachelor's degree level and above which provided good responses on the understanding of the factors that affect the implementation of an IWMIS in MWE.

4.3.4 Period worked at MWE

Table 7: Period worked at MWE

Period worked with Ministry of Water

		Frequency	Percent
Valid	Less than one year	17	18.5
	1 - 4 years	27	29.3
	5 - 9 years	33	35.9
	10 years and above	6	6.5
	Total	83	90.2
Missing	Non-response	9	9.8
Total		92	100.0

Source: Primary data

From the table above, 17(18.5%) of the respondents had spent less than one year with MWE, 27(29.3%) of the respondents had spent between one to four years with MWE, 33(35.9%) of the respondents had spent between 5-9 years with MWE, and 6(6.5%) of the respondents had spent 10 years and above working with MWE, while 9(9.8%) didn't indicate their position. Majority of the respondents (71.7%) had spent more than one year with MWE implying that the data that was collected came from experienced people hence giving vital information regarding factors that affect the implementation of IWMIS which was good for the study findings.

4.3.5 Departments of the respondents

The researcher was interested in the departments the respondents were got from at MWE and the table below presents the findings.

Table 8: Departments of the respondents

		Frequency	Percent
Valid	Urban Water Supply and Sanitation Department	18	19.6
	Rural Water Supply and Sanitation Department	28	30.4
	Water for Production Department	12	13.0
	Water and Environment Sector Liaison Department	26	28.3
	Policy and Planning Department	8	8.7
	Total	92	100.0

Source: Primary Data

From the above table 8, 18(19.6%) of the respondents came from the Urban Water Supply and Sanitation Department, 28(30.4%) came from Rural Water Supply and Sanitation Department, 12(13.0%) came from Water for Production Department, 26 (28.3%) came from Water and Environment Sector Liaison Department while 8(8.7%) came from Policy and Planning Department. This is an indication that all departments from DWD were represented hence removing a bias of having information that comes from a few departments leaving out some.

4.4 Empirical findings on factors influencing the implementation of an integrated water management information system of ministry of water and environment, Uganda

The overall purpose was to investigate the factors influencing the implementation of the national integrated water management information system in the ministry of water and environment. The

findings were obtained from questionnaires, interviews and documentary reviews. They were discussed as follows:-

4.4.1 Objective one: To investigate how performance expectancy affects the implementation of an integrated water management information system of ministry of water and environment in Uganda.

To investigate how performance expectancy affects the implementation of an integrated water management information system of ministry of water and environment in Uganda, the responses derived from the questionnaires are presented in a percentage table, Pearson Correlation and regression analysis as follows:-

4.4.1.1 The frequency and percentage analysis of the performance expectancy and how it affects the implementation of an integrated water management information system of ministry of water and environment in Uganda.

The frequency and percentage analysis was used to assess performance expectancy affects the implementation of an integrated water management information system of ministry of water and environment in Uganda as a study objective whose data is analyzed under the frequency and percentage in table 9 presented below:

Table 9: The frequency and percentage of performance expectancy

SN	Concerns/statements	Responses				
		SA(%)	A(%)	N(%)	D(%)	SD(%)
1	Usefulness of an incoming innovation is a concern in this ministry	21(22.8)	41(44.6)	2(2.2)	15(16.3)	12(13.0)
2	There is always an estimation of results of an innovation in this ministry	8(8.7)	36(39.1)	15(16.3)	19(20.7)	14(15.2)
3	Individuals' expectancy towards an innovation motivates them in this ministry	20(21.7)	30(32.6)	14(15.2)	17(18.5)	11(12.0)
4	Individuals can be motivated if they believe in a positive results out of an innovation	32(34.8)	30(32.6)	7(7.6)	12(13.0)	11(12.0)
5	Control and policies in this ministry are associated with the individual's expectations out of an innovation	5(5.4)	21(22.8)	16(17.4)	19(20.7)	31(33.7%)
6	Rewards are provided to employees in order to adopt and use an innovation in this ministry	8(8.7)	10(10.9)	13(14.1)	10(10.9)	51(55.4)
7	Employees will accept an innovation if they believe it is a benefit to them	32(34.8)	31(33.7)	8(8.7)	6(6.5)	15(16.3)

Source: Primary data

Key:

SA (%)	**A**	**N**	**D**	**SD**	**(%)**
Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	Percent

Question one: Usefulness of an incoming innovation is a concern in MWE

On whether the usefulness of an incoming innovation is a concern in MWE; 62(67.4%) of the respondents agreed, 2(2.2%) remained neutral while 27(29.3%) of the respondents disagreed. This implies that as an innovation comes at MWE, how useful it is going to be becomes a concern to the employees basing on the agreement of the majority of the respondents that stand at 67.4%. This concern first creates some anxiety among the employees of the ministry and creates time of having an innovation studied and later implemented.

Question two: There is always an estimation of results of an innovation in MWE

On whether there is always an estimation of results of an innovation in MWE; 44(47.8%) of the respondents agreed, 15(16.3%) remained neutral while 33(35.9%) of the respondents disagreed. This implies that there is a generally high degree of estimating the results of an innovation at MWE as the majority of the respondents (47.8%). However, this estimation is limited but has an impact on the embracement of an innovation as there is a provision of estimations that can hinder the implementation.

Question three: Individuals' expectancy towards an innovation motivates them in MWE

On whether individuals' expectancy towards an innovation motivates them MWE; 50(54.3%) of the respondents agreed, 14(15.2%) remained neutral while 28(30.5%) of the respondents disagreed. This implies that individual expectations out of an innovation have an impact on the implementation of an innovation at MWE as stated by the majority 54.3% of the respondents. For an innovation to be adopted, it starts with an individual, and then spreads throughout an organization. Since there is an initial motivation at an individual basis, then slow adoption at an organisational level is expected.

Question four: Individuals being motivated by the belief in positive results out of an innovation

On whether individuals can be motivated if they believe in positive results out of an innovation; 62(67.4%) of the respondents agreed, 7(7.6%) remained neutral, while 23(25%) of the respondents disagreed. Basing on the response of the majority 67.4%, it implies that individuals can be motivated to utilise an innovation if they believe that it can be of positive results. Having individuals' belief in positive results, it enables an innovation get implemented as the inputs and suggestions of the individuals are the ones that the management may consider in order to let an implementation of an innovation take place.

Question five: Control and policies in this ministry are associated with the individual's expectations out of an innovation

On whether control and policies in this ministry are associated with the individual's expectations out of an innovation; 26(28.2%) of the respondents agreed, 16(17.4%) remained neutral while 50(54.4%) of the respondents disagreed. This implies that controls and policies in MWE are not associated with the individual's expectations out of an innovation basing on the response of majority 54.4% of the respondents that disagreed. Having such a scenario in place, it means that however much the policies and controls are implemented, there will always be a challenge of having an innovation adopted as the individuals play a vital role in adoption of an innovation.

Question six: Rewards are provided to employees in order to adopt and use an innovation in MWE

On whether rewards are provided to employees in order to adopt and use an innovation MWE; 18(19.6%) of the respondents agreed, 13(14.1%) remained neutral while 61(66.3%) of the respondents disagreed. This implies that there are no rewards provided to employees in order to adopt an innovation at MWE basing on the majority 66.3% of the respondents that disagreed. Having no rewards provided to employees in order to adopt an innovation, the employees become less motivated hence having a set back of an incoming innovation that would rather be utilised by the same employees who are not motivated to take it up.

Question seven: Employees will accept an innovation if they believe it is a benefit to them

On whether employees will accept an innovation if they believe it is a benefit to them; 63(68.5%) of the respondents agreed, 8(8.7%) remained neutral while 21(22.8%) of the respondents disagreed. This implies that employees can easily adopt an innovation once they get to know that it will be of a benefit to them. Once employees get positive information about an innovation and get to be part of it, they will accept to use it hence easy implementation in the entire organization as stated by 68.5% majority of the respondents.

4.4.1.2 Testing hypothesis one: Performance expectancy has a significant effect on the implementation of an integrated water management information system of ministry of water and environment in Uganda.

To provide more substantiated analysis on the effect performance expectancy on the implementation of an IWMIS in MWE, Pearson correlation analysis was also used as shown in table 10 below:

Table 10: The correlations between performance expectancy and implementation of an IWMIS

Correlations

		Performance Expectancy	Integrated Water Management Information System
Performance Expectancy	Pearson Correlation	1	.730**
	Sig. (2-tailed)		.000
	N	92	92
Integrated Water Management Information System	Pearson Correlation	.730**	1
	Sig. (2-tailed)	.000	
	N	92	92

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

Source: Primary Data

The study revealed that there is a positive correlation between performance expectancy and Integrated Water Management Information System at 0.730** with a significance level of 0.000 at the level of 0.01. The implication is that with the performance expectancy in place taking a positive direction, Integrated Water Management Information System implementation also takes a positive direction. This implies that in presence of performance expectancy, implementation of Integrated Water Management Information System also improves.

4.4.1.3 Regression analysis showing performance expectancy and Integrated Water Management Information System

Regression analysis was also used to analyze the data on the effect of performance expectancy and Integrated Water Management Information System implementation and table 11 below presents the findings:

Table 11: Regression of availability of performance expectancy and Integrated Water Management Information System

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.730[a]	.534	.528	.62017	.534	102.972	1	90	.000

a. Predictors: (Constant), Performance Expectancy

Source: Primary Data

From the above table, the Adjusted R Square, (which tells how a set of independent variables explains variations in the dependent variable) was 0.528. This means that performance expectancy as a dimension of the independent variable accounts for 52.8% of the variations in affecting the implementation of the IWMIS. The finding suggests that currently, performance expectancy affects the implementation of the IWMIS at 52.8%. The hypothesis that performance expectancy has a significant effect on the implementation of an integrated water management information system of ministry of water and environment in Uganda is therefore accepted.

The analysis of variance "F" as shown in table 12 below is 102.972 with a significance of 0.000. This shows that "F" is statistically significant and implies that performance expectancy as a dimension of the independent variable has a statistically significant effect on the implementation of the IWMIS.

Table 12: Regression analysis of performance expectancy and the implementation on the IWMIS

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	39.604	1	39.604	102.972	.000[a]
	Residual	34.615	90	.385		
	Total	74.219	91			

a. Predictors: (Constant), Performance Expectancy

b. Dependent Variable: Integrated Water Management Information System

Source: Primary Data

Table 13: Regression analysis showing the effect of performance expectancy on the implementation of the IWMIS

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	.663	.234		2.835	.006	.198	1.127
	Performance Expectancy	.736	.073	.730	10.148	.000	.592	.880

a. Dependent Variable: Integrated Water Management Information System

Source: Primary Data

The table 13 above shows the effect of performance expectancy as measured by a standardized regression (B). This was used to find out the effect of performance expectancy on the dependent

variable- IWMIS. The results show that statistically, performance expectancy has a standardized coefficient (B) of 0.730, meaning that performance expectancy as a dimension of the independent variable explains the variations of the dependent variable by 73%. Therefore, this implies that performance expectancy is positively related to IWMIS in MWE. Hence, if there is an improvement in performance expectancy, there would be a positive effect/improvement in the implementation of IWMIS. This is in agreement with the results from correlation and regression analyses which indicated a positive relationship between performance expectancy and IWMIS with correlation co-efficiency of 0.730** implying that as an independent dimension explained effect by 73%. Thus improving on the performance expectancy would improve on IWMIS implementation.

4.4.1.4 Qualitative findings on performance expectancy

To provide more substantiated information on the effects of performance expectancy on the implementation of IWMIS at MWE, interviews with key informants were held and the following were discovered.

Perceived expectations and improvements out of an IWMIS:

Efficiency and effectiveness

IWMIS is estimated to bring about improvement on efficiency, availing timely information for decision making and improved/speedy delivery of public water services.

Communication enhancement

IWMIS is seen as mode that will make communication much easier as it will be good in compiling data, swift sharing of information across the entire ministry's department and external stakeholders.

Tool of analysis

IWMIS will act as a basis to analyse the achievements of the ministry. This is because it will make quick tracking of all the processes and procedures and avail timely information that will be used in monitoring of the progress of different departments.

The above is what is expected out of the IWMIS but as for the time being, all this is still in a dim light. This is because of the challenge of transformation that the ministry is faced with that requires intense study on how best it can be tackled.

There is a similarity between quantitative results and qualitative results generated from the study. From the quantitative results, it was brought out clearly that anxiety among the employees creates time of having an innovation studied and later implemented, presence of a high degree of estimating the results of an innovation before being tried and lack of rewards provided to employees as a motivation to utilise an innovation. In the correlation results, there is a positive correlation between performance expectancy and IWMIS at 0.730** implying that performance expectancy has an effect on the implementation of IWMIS. Furthermore, in the qualitative results, IWMIS was perceived as a mode of communication and a basis of but for the time being, these have not been reached upon because of the challenge of transformation that the ministry is faced with. These challenges related to transformation are highly reflected in the opinions raised in the quantitative results among the concepts raised by the researcher that the majority of the respondents are in agreement with.

4.4.2 Objective two: To establish how effort expectancy affects the implementation of an integrated water management information system of Ministry of Water and Environment in Uganda.

To establish how effort expectancy affects the implementation of an integrated water management information system of Ministry of Water and Environment in Uganda the responses derived from the questionnaires are presented in a percentage table, Pearson Correlation and regression analysis as follows:-

4.4.2.1 The frequency and percentage table showing the effects of effort expectancy on the implementation of an integrated water management information system of Ministry of Water and Environment in Uganda.

Table 14: The frequency and percentage table showing the effect of effort expectancy on implementation of IWMIS.

SN	Opinions/statements	Responses				
		SA(%)	A(%)	N(%)	D(%)	SD(%)
1	It is usually easy for employees here to use an introduced innovation	6(6.5)	25(27.2)	8(8.7)	26(28.3)	27(29.3)
2	Employees first take time to weigh the required efforts to use an introduced innovation	18(19.6)	32(34.8)	16(17.4)	11(12.0)	15(16.3)
3	Employees have a belief in achieving results before taking an action	21(22.8)	35(38.0)	15(16.3)	9(9.8)	12(13.0)
4	Employees get feedback to gauge their progress and adjust effort while doing any task	13(14.1)	27(29.3)	15(16.3)	18(19.6)	19(20.7)
5	The employees usually have knowledge and skills to use any introduced innovation in this ministry	9(9.8)	23(25.0)	11(12.0)	28(30.4)	21(22.8)
6	Difficult goals are set to motivates employees to take action if they believe such action has the potential to achieve the goals in this ministry	4(4.3)	18(19.6)	20(21.7)	19(20.7)	31(33.7)

Source: Primary data

Key:

SA (%)	**A**	**N**	**D**	**SD**	**(%)**
Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	Percent

Question one: It is usually easy for employees here to use an introduced innovation

On whether it is usually easy for employees here to use an introduced innovation; 31(33.7%) of the respondents agreed, 8(8.7%) remained neutral while 53(57.6%) of the respondents disagreed. This implies that employees at MWE find it rather not easy to use an innovation that is introduced in the ministry as stated by majority 57.6% of the respondents that disagreed. This is because the employees lack information about an upcoming innovation and they therefore have to wait for an arrangement to be trained about an innovation and having to draw examples from others that have tried to utilise the innovation and later come in to use it too. Even adjusting from a rather usual trend also makes it for employees to be hesitant to use an innovation hence making it take some time to be adopted and implemented.

Question two: Employees first take time to weigh the required efforts to use an introduced innovation

On whether employees first take time to weigh the required efforts to use an introduced innovation; 50(54.4%) of the respondents agreed, 16(17.4%) remained neutral while 26(28.3%) of the respondents disagreed. Having the majority of the respondents (54.4%) agreeing, it implies that employees first take time to weigh the required efforts to use an introduced innovation. This is so because the innovation being new, time has to be taken to study and know how much it may need in order to be incorporated into the organizational running.

Question three: Employees have a belief in achieving results before taking an action

On whether employees have a belief in achieving results before taking an action; 56(60.8%) of the respondents agreed, 15(16.3%) remained neutral while 21(22.8%) of the respondents disagreed. This implies that employees have a belief in achieving results before taking an action as agreed by the majority 60.8% of the respondents. Therefore, having such in mind, when

employees are exposed to an innovation, they develop some anxiety of using it and at the end of the day; they yield less hence being regarded as non-productive. This justifies the reason as to why an innovation takes some time to be utilised from the time it is introduced.

Question four: Employees get feedback to gauge their progress and adjust effort while doing any task

On whether employees get feedback to gauge their progress and adjust effort while doing any task; 40(43.4%) of the respondents agreed, 15(16.3%) remained undecided while 37(40.3%) of the respondents disagreed. This is an implication that there is limited feedback given to employees that helps them gauge their progress and adjust efforts while undertaking a task. This is so because the percentage of the majority that agreed is weak enough to convince the study plus the gap between those that agreed and those that disagreed is too small. Having limited feedback given to employees to gauge their progress, it puts them in a dilemma of adjusting their efforts which would be good for the adoption of an innovation.

Question five: The employees usually have knowledge and skills to use any introduced innovation in this ministry

On whether the employees usually have knowledge and skills to use any introduced innovation in this ministry; 32(34.8%) of the respondents agreed, 11(12.0%) remained neutral while 49(53.2%) of the respondents agreed. This implies that there is usually knowledge and skill gap among the employees that would enable them use an innovation. Because of this gap coupled with a desire to achieve results at the end of the day, employees find it hard to use an innovation which leads to the delay of its implementation.

Question six: Difficult goals are set to motivate employees to take action if they believe such action has the potential to achieve the goals in this ministry

On whether difficult goals are set to motivate employees to take action if they believe such action has the potential to achieve the goals in this ministry; 22(23.9%) of the respondents agreed, 20(21.7%) remained undecided while 50(54.4%) of the respondents disagreed. This implies that difficult goals are not set to motivate employees to take action if they believe such action has the potential to achieve the goals in MWE as stated by the majority 54.4% of the respondents that disagreed. Because difficult goals are not set for the employees, they don't find their own way to creativity that would otherwise help them try to use an innovation which would ensure a smooth entry and implementation in MWE.

4.4.2.1 Testing Hypothesis two: Effort expectancy has no significant effect on the implementation of an integrated water management information system of Ministry of Water and Environment in Uganda.

To provide more substantiated analysis on the effects of effort expectancy on the implementation of IWMIS in MWE, Pearson correlation analysis was also used.

The results in table 15 below indicate that there is a significant positive correlation between effort expectancy and IWMIS at 0.693** with a significance of 0.000 at the level of 0.01. This implies that the effort expectancy has a significant effect on IWMIS. Positive direction means as one variable increases, the other also increases. From the above results, it indicates that as effort expectancy increases, IWMIS implementation also increases.

Table 15: Correlation between effort expectancy and IWMIS

Correlations

		Effort Expectancy	Integrated Water Management Information System
Effort Expectancy	Pearson Correlation	1	.693**
	Sig. (2-tailed)		.000
	N	92	92
Integrated Water Management Information System	Pearson Correlation	.693**	1
	Sig. (2-tailed)	.000	
	N	92	92

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

Source: Primary Data

4.4.2.3 Regression analysis showing the effect of effort expectancy and IWMIS

Regression analysis showing the effect of effort expectancy and IWMIS was used as shown in the tables below:-

Table 16: Regression analysis showing the effect of effort expectancy and IWMIS

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.693[a]	.480	.474	.65506	.480	82.962	1	90	.000

a. Predictors: (Constant), Effort Expectancy

From the model summary, effort expectancy as a dimension of the independent variable- has the Adjusted R square of 0.474. This means that the independent variable effort expectancy accounts for 47.4% on the implementation of IWMIS at MWE. The hypothesis that Effort expectancy has no significant effect on the implementation of an integrated water management information system of Ministry of Water and Environment in Uganda is therefore rejected, an alternative is accepted.

Table 17: Regression analysis showing the effect of effort expectancy on IWMIS

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	35.600	1	35.600	82.962	.000[a]
	Residual	38.620	90	.429		
	Total	74.219	91			

a. Predictors: (Constant), Effort Expectancy

b. Dependent Variable: Integrated Water Management Information System

Source: Primary Data

The analysis of variance "F" as shown in the table 17 is 82.962 with a significance of 0.000. This shows that "F" is statistically significant and implies that effort expectancy as a dimension of independent variable has an effect on the implementation of an IWMIS.

Table 18: Regression analysis showing the effect of effort expectancy and IWMIS

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	.903	.234		3.857	.000	.438	1.368
	Effort Expectancy	.705	.077	.693	9.108	.000	.551	.859

a. Dependent Variable: Integrated Water Management Information System

Source: Primary Data

The table 18 above shows the effect of effort expectancy as measured by a standardized regression (B). This was used to find out the effect of effort expectancy on the dependent variable- IWMIS. The results show that statistically, effort expectancy has a standardized coefficient (B) of 0.693, meaning that effort expectancy as a dimension of the independent variable explains the variations of the dependent variable by 69.3%. Therefore, this implies that effort expectancy is positively related to IWMIS at MWE. Hence, if there is any alteration in effort expectancy, there would be a corresponding effect in IWMIS implementation. This is in agreement with the results from correlation and regression analyses which indicated a positive relationship between the effects of effort expectancy and IWMIS with correlation co-efficiency of 0.693** implying that as an independent dimension explained variations in IWMIS by 69.3%.

4.4.2.2 Qualitative findings on effort expectancy

To find more substantial information on effort expectancy and the implementation of an IWMIS at MWE, interviews were held with key informants and the following was discovered.

Definition of the IWMIS

There is a challenge of streamlining what each department within the ministry will need for the IWMIS. Each department has its own roles and responsibilities. There is a need of identifying the stages under which each role is to be incorporated and this requires time to make an intense study of each department and later the ministry. This makes the implementation rather stagger.

Involved costs

IWMIS requires trained personnel, purchasing of the necessary equipment like computers and servers and constant maintenance to keep it functional. It will also tend to shift the goals of the current ministry if is to be done in a short term whereby too much attention will be put on IT rather than water development. Compliance with technology tends to be a slower process as the majority of the current personnel in the ministry is not technological advanced basing on the required rate of IWMIS implementation.

Priority

The importance of IWMIS is known to the managers but allocation of the first priority to it is still a challenge. Priorities are usually allocated to other departments and ICT finds it hard to be on top of the agenda.

From the concepts raised by the researcher in the quantitative results, it was found out that employees have an information gap and this results into taking time to weigh the required efforts to use an innovation, employees have a belief in achieving results before

taking action and presence of limited feedback given to employees to gauge their progress and adjust efforts while undertaking a task. From the model summary, effort expectancy as a dimension of the independent variable- has the Adjusted R square of 0.474 meaning that effort expectancy accounts for 47.4% on the implementation of IWMIS at MWE.

In the qualitative results, it was discovered that there is a challenge of streamlining roles and responsibilities of each department, financial requirements involved in the implementation being a challenge, an giving a priority to the long existing function of the ministry rather than the implementation of the IWMIS.

Both quantitative and qualitative results pose a similarity in a sense that as there is an information gap among the employees of the ministry, time taken to weigh the importance of an IWMIS are represented in the qualitative findings in a manner that the departments within the ministry gauge their own roles first which reflects an information gap about the importance of an IWMIS, allocating priorities to the IWMIS which can be taken back to lack of feedback given to those that are trying out innovations in order to progress. All these are concurring as to why the implementation of an IWMIS is trailing at MWE.

4.4.3 Objective three: To find out how facilitating conditions affect the implementation of an integrated water management information system of Ministry of Water and Environment in Uganda.

To find out how facilitating conditions affect the implementation of an integrated water management information system of Ministry of water and environment in Uganda, the

responses derived from the questionnaires are presented in a percentage table, Pearson Correlation and regression analysis as follows:

4.4.3.1 The frequency and percentage analysis of facilitating conditions and the implementation of an integrated water management information system at MWE

The frequency and percentage analysis was used to find out how facilitating conditions affect the implementation of an integrated water management information system MWE as a study objective whose data is analyzed under the frequency and percentage in table 19 presented below:

Table 19: The frequency and percentage of facilitating conditions and IWMIS

SN	Opinions/statements	Responses				
		SA(%)	A(%)	N(%)	D(%)	SD(%)
1	There are policies that support innovations in this ministry	12(13.0)	40(43.5)	15(16.3)	6(6.5)	18(19.6)
2	Policies that support innovations in this ministry are well implemented	7(7.6)	33(35.9)	20(21.7)	15(16.3)	17(18.5)
3	There is a well laid down structure that provides for innovations in this ministry	6(6.5)	29(31.5)	17(18.5)	17(18.5)	23(25.0)
4	Software programs that support innovations are present in this ministry	4(4.3)	31(33.7)	16(17.4)	19(20.7)	22(23.9)
5	There is availability of databases that enable the implementation and utilization of an innovation in this ministry	20(21.7)	35(38.0)	9(9.8)	14(15.2)	14(15.2)
6	Training is provided to employees to empower them utilize innovations	21(22.8)	37(40.2)	13(14.1)	14(15.2)	7(7.6)
7	Employees are supported to utilize innovations in this ministry	16(17.4)	45(48.9)	10(10.9)	8(8.7)	13(14.1)

Source: Primary data

Key: SA (%)	**A**	**N**	**D**	**SD**	**(%)**
Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	Percent

Question one: There are policies that support innovations in this ministry

On whether there are policies that support innovations in MWE; 52(56.5%) of the respondents agreed, 15(16.3%) remained neutral while 24(26.1%) of the respondents disagreed. This implies that there are policies in MWE that support innovations basing on the response of the majority at 56.5% of the respondents that agreed.

Question two: Policies that support innovations in this ministry are well implemented

On whether policies that support innovations in MWE are well implemented; 40(43.5%) of the respondents agreed, 20(21.7%) remained neutral while 32(34.8%) of the respondents disagreed. This implies that there is limited implementation of the policies that support innovations at MWE. This is so because the percentage of the majority that agreed at 43.5% indicates that the percentage of those that are aware of the policy implementation are few hence cannot convince the study that there is a higher implementation of the policies that support innovations at MWE.

Question three: There is a well laid down structure that provides for innovations in this ministry

On whether there is a well laid down structure that provides for innovations in MWE; 35(38.0%) of the respondents agreed, 17(18.5%) remained neutral while 40(43.5%) of the respondents disagreed. This implies that there is no well-established structure that supports innovations basing on the response of the majority that disagreed. This is so because different innovations at MWE come under different programs that are implemented through different departments. Therefore, this kind of scenario makes it hard to have a uniform structure for the implementation of an innovation throughout the ministry.

Question four: Software programs that support innovations are present in this ministry

On whether software programs that support innovations are present in MWE; 35(38%) of the respondents agreed, 16(17.4%) remained neutral while 41(44.6%) of the respondents disagreed. This implies that there are limited software programs at MWE that support innovations as majority of the respondents (62%) are not aware and disagree. This further indicates that these limited software programs are only concentrated in given departments and lack in other departments since respondents were drawn from different departments across DWD.

Question five: There is availability of databases that enable the implementation and utilization of an innovation in this ministry

On whether there is availability of databases that enable the implementation and utilization of an innovation in MWE, 55(59.7%) of the respondents agreed, 9(9.8%) remained neutral while 28(30.4%) of the respondents disagreed. This implies that there is a documentation of all the processes in the ministry from where information is being drawn to get precedence on how to go about an incoming innovation as stated by the majority 59.7% of the respondents that agreed.

Question six: Training is provided to employees to empower them to utilize innovations

On whether training is provided to employees to empower them to utilize innovations; 58(63%) of the respondents agreed, 13(14.1%) remained neutral while 21(22.8%) of the respondents disagreed. This implies that there are training programs at MWE that aim at empowering employees with necessary knowledge for the utilization of an innovation as stated by 63% majority of the respondents.

Question seven: Employees are supported to utilize innovations in this ministry

On whether employees are supported to utilize innovations in MWE; 61(66.3%) of the respondents agreed, 10(10.9%) of the respondents remained neutral while 21(22.8%) of the respondents disagreed. This implies that employees are supported to utilise an innovation as stated by 66.3% majority of the respondents that agreed. This kind of support comes in form of mentoring by the managers to enable employees get used and introduced to an incoming innovation so that the employees are in position of utilizing it.

4.4.3.1 Testing Hypothesis three: Facilitating conditions significantly affect the implementation of an integrated water management information system of Ministry of water and environment in Uganda.

To provide more substantiated analysis on the effect of facilitating conditions on the implementation of an integrated water management information system of Ministry of water and environment in Uganda, Pearson correlation analysis was also used as shown in table 20.

The results in table 20 below indicate that there is a significant positive correlation between facilitating conditions and IWMIS at 0.598** with a significance of 0.000 at the level of 0.01. This implies that facilitating conditions affects the implementation of IWMIS at MWE. With the increase of facilitating conditions, the implementation of IWMIS also increases. The positive direction means as one variable increases, the other also increases. From the above results, it indicates that as facilitating conditions increases, the implementation of the IWMIS increases. The hypothesis that facilitating conditions significantly affect the implementation of an integrated water management information system of Ministry of water and environment in Uganda is therefore accepted.

Table 20: The correlation between facilitating conditions and IWMIS

Correlations

		Facilitating Conditions	Integrated Water Management Information System
Facilitating Conditions	Pearson Correlation	1	.598**
	Sig. (2-tailed)		.000
	N	92	92
Integrated Water Management Information System	Pearson Correlation	.598**	1
	Sig. (2-tailed)	.000	
	N	92	92

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

Source: Primary Data

4.4.3.2 Regression analysis showing the effect of facilitating conditions on IWMIS

To get more substantial information on facilitating conditions and IWMIS, a regression analysis was used and the results are reflected in tables below:-

Table 21: The regression analysis showing the effect of facilitating conditions on IWMIS

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.598[a]	.358	.351	.72774	.358	50.140	1	90	.000

a. Predictors: (Constant), Facilitating Conditions

From the model summary, facilitating conditions as a dimension of the dependent variable- IWMIS has an Adjusted R square of 0.351. This means that the independent variable facilitating conditions accounts for 35.1% on IWMIS. The finding suggests that facilitating conditions affects the implementation of IWMIS by 35.1%. The hypothesis that facilitating conditions significantly affect the implementation of an integrated water management information system of Ministry of water and environment in Uganda is therefore accepted.

Table 22: The regression analysis showing the effect of facilitating conditions on IWMIS

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	26.555	1	26.555	50.140	.000[a]
	Residual	47.665	90	.530		
	Total	74.219	91			

a. Predictors: (Constant), Facilitating Conditions

b. Dependent Variable: Integrated Water Management Information System

Source: Primary Data

The analysis of variance "F" as shown in the table 22 is 50.140 with a significance of 0.000. This shows that "F" is statistically significant and implies that facilitating conditions as a dimension of independent variable has a significant effect on IWMIS.

The table 23 below shows the effect of facilitating conditions as measured by a standardized regression (B). This was used to find out the effect of facilitating conditions on the dependent variable- IWMIS. The results show that statistically, facilitating conditions has a standardized coefficient (B) of 0.598, meaning that facilitating conditions as a dimension of the independent

variable explains the variations of the dependent variable by 59.8%. Therefore, this implies that facilitating conditions is positively related to IWMIS in MWE. Hence, if there is any alteration in facilitating conditions, there would be a corresponding effect in IWMIS. This is in agreement with the results from correlation and regression analyses which indicated a positive relationship between facilitating conditions and IWMIS with correlation co-efficiency of 0.598** implying that as an independent dimension explained effects in IWMIS at 59.8%.

Table 23: The regression analysis showing the effect of facilitating conditions on IWMIS

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	1.020	.282		3.619	.000	.460	1.580
	Facilitating Conditions	.609	.086	. 598	7.081	.000	.438	.779

a. Dependent Variable: Integrated Water Management Information System

Source: Primary Data

4.4.3.3 Qualitative findings on facilitating conditions

To get more substantiated information on facilitating conditions towards the implementation of IWMIS, interviews were held with KIs and the following was discovered:-

Policies in place

The policies are not clear on how information should be managed; whether to use file/paper system or automated system. This creates an up-hazard state where by an individual or department takes an own decision that defers from one another.

Personnel

Not everyone in the ministry has the know-how of utilizing the IT system. This called for the employment of an IT officer that would handle all the IT needs of the ministry. This was however discovered that one IT person was not enough to handle the entire ministry's IT needs and more nine were hired bringing a number to ten. This number is still less compared to the volume of work the ministry has at the centre and across the country.

Training

There has been training of staff that takes place to equip them with knowledge on how to use IT equipment. However, this is too basic as it is usually limited on utilizing the internet, intranet and word processing leaving out the management of IT bit of it.

Supporting equipment

There is a presence of IT equipment like computers and internet. However, there is a need for continuous up-grade of internet which is usually costly and requires a full time attention of a specialist.

The quantitative results discovered that there is limited implementation of the policies that support innovations at MWE, lack of a well-established structure that supports innovations, limited software programs and presence of training programs at MWE. In the coefficients, facilitating conditions have a standardized coefficient (B) of 0.598, meaning that facilitating conditions explain the variations of the dependent variable by 59.8%.

The qualitative information indicated that the policies are not clear on how information should be managed; whether to use file/paper system or automated system, limited number of personnel compared to the volume of work that the implementation would require, training in IT being too basic leaving out the management of IT bit of it and financial constraints related to equipment like computers and internet plus a need for continuous up-grade of internet.

The two- qualitative and quantitative results have a similarity in a sense that policies that support innovations in the quantitative results are reflected in the qualitative results whereby the policies don't provide a direction on how information should be managed at the ministry hence affecting the implementation of an IWMIS. The present structure at the ministry was said to be lacking in the quantitative results and this was further brought to light whereby the presence of IT personnel was pointed out in the qualitative results as not enough to handle the entire work within the ministry. The quantitative results presented the availability of the training in the ministry that aims at equipping employees with the knowledge of how to manage innovations. However, the qualitative results showed that the available training offered is too basic when it comes to IWMIS as it only limits on how to operate computers leaving out the management bit of information.

All the above findings, in both quantitative and qualitative approaches are concurring in the challenges within MWE that affect the implementation of an IWMIS.

4.5.4 Integrated Water Management Information System (Dependent Variable)

To determine the implementation IWMIS, the responses derived from the questionnaires are presented in a percentage table, Pearson Correlation and regression analysis as presented hereunder:-

4.5.4.1 The frequency and percentage analysis on IWMIS

The frequency and percentage analysis was used to determine IWMIS as a dependent variable and findings are analyzed under the frequency and percentage tables as in table 24 below:-

Table 24: The frequency and percentage of IWMIS

SN	Statements/questions	RESPONSES				
		SA(%)	A(%)	N(%)	D(%)	SA(%)
1	Automated systems are used in collecting data necessary for the ministry	9(9.8)	12(13.0)	13(14.1)	11(12.0)	47(51.1)
2	The current systems used in data collection are flexible	14(15.2)	14(15.2)	11(12.0)	8(8.7)	45(48.9)
3	Data sorting and organizing is done manually	22(23.9)	47(51.1)	8(8.7)	5(5.4)	10(10.9)
4	File system is employed in storing of the ministry's data	24(26.1)	49(53.3)	11(12.0)	3(3.3)	4(4.3)
5	Automated systems are in place to store the ministry's data	15(16.3)	25(27.2)	9(9.8)	16(17.4)	27(29.3)
6	There is adequate and sufficient methods of backing up data in this ministry	8(8.7)	28(30.4)	13(14.1)	20 (21.7)	23(25.0)
7	Decision making in this ministry is largely fact based	9(9.8)	34(37.0)	12(13.0)	12(13.0)	25(27.2)
8	The stored information is widely utilized in decision making	7(7.6)	47(51.1)	8(8.7)	14(15.2)	16(17.4)
9	There is timely feedback in this ministry due to a well-established Integrated Water Management Information System	5(5.4)	26(28.3)	18(19.6)	14(15.2)	29(31.5)

Source: Primary data

Key:

SA (%)	**A**	**N**	**D**	**SD**	**(%)**
Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	Percent

Question one: Automated systems are used in collecting data necessary for the ministry

On whether automated systems are used in collecting data necessary for MWE; 21(22.8%) agreed, 13(14.1%) remained neutral while 58(63.1%) of the respondents disagreed. This implies that automated systems are not used in collecting data necessary for MWE as majority 63.1% of the respondents disagreed. The use of manual system like hard copy forms are used to capture data that MWE needs for its activities.

Question two: The current systems used in data collection are flexible

On whether the current systems used in data collection are flexible; 28(30.4%) of the respondents agreed, 11(12.0%) remained neutral while 53(57.6%) of the respondents disagreed. This implies that the employed data collection methods at MWE are not flexible as stated by the majority 57.6% of the respondents that disagreed. Since manual systems are used in capturing data, it requires time for entry and analysis to create usable information. This manual based systems consume time hence being non flexible.

Question three: Data sorting and organizing is done manually

On whether data sorting and organizing is done manually; 69(75%) of the respondents agreed, 8(8.7%) remained neutral while 15(16.3%) of the respondents disagreed. This implies that data sorting and organizing is done manually as it is in agreement with majority of the respondents at 75%. This is justified by the fact that from the collection entry point that is done manually, even the sorting and organizing has to be done manually that delays the processing which feeds into dissemination.

Question four: File system is employed in storing of the ministry's data

On whether file system is employed in storing of the ministry's data; 73(79.4%) of the respondents agreed, 11(12.0%) remained neutral while 7(7.6%) of the respondents disagreed.

This implies that data storage is based on the file system that is purely manual as agreed by the majority of the respondents at 79.4% of the respondents.

Question five: Automated systems are in place to store the ministry's data

On whether automated systems are in place to store the ministry's data; 40(43.5%) of the respondents agreed, 9(9.8%) remained neutral while 43(46.6%) of the respondents disagreed. This implies that there is limited use of automation systems for data storage at MWE as there is a slight difference between those that agreed and those that disagreed. To a larger extent however, automated systems are not used in the storage of data as the majority of the respondents stated.

Question six: There are adequate and sufficient methods of backing up data in this ministry

On whether there are adequate and sufficient methods of backing up data in MWE, 36(39.1%) of the respondents agreed, 13(14.1%) remained neutral while 43(46.7%) of the respondents disagreed. This implies that the current manual systems at MWE that are employed to store data are not sufficient enough to have a reliable data back-up for the ministry.

Question seven: Decision making in this ministry is largely fact based

On whether decision making in MWE is largely fact based; 43(46.7%) of the respondents agreed, 12(13.0%) remained neutral while 37(40.2%) of the respondents disagreed. This implies that there is a limited degree of factual based decision making at MWE because the majority of the respondents that agreed, their percentage is weak to convince the study that decision making is based on facts. This is because of the time taken to retrieve the necessary information that is largely kept in manual systems. So, the little information that is got is used to take decisions as they are always wanted timely but the retrieval of information delays the process.

Question eight: The stored information is widely utilized in decision making

On whether the stored information is widely utilized in decision making; 54(58.7%) of the respondents agreed, 8(8.7%) remained neutral while 30(32.6%) of the respondents disagreed. This implies that the stored information by the ministry is widely used in decision making as stated by the majority 58.7% of the respondents that agreed. This justifies the need for an IWMIS at MWE which will enable storage and retrieval of information that is used in decision making processes.

Question nine: There is timely feedback in this ministry due to a well-established Integrated Water Management Information System

On whether there is timely feedback in this ministry due to a well-established Integrated Water Management Information System; 31(33.7%) of the respondents agreed, 18(19.6%) remained neutral while 43(46.7%) of the respondents disagreed. This implies that MWE has a challenge of timely feedback that is as a result of lack of a well-established IWMIS. This is because from data caption, sorting/organizing and storage is done manually and all this delays the process of information dissemination to the relevant end users.

4.5.4.2 Qualitative findings on IWMIS

To get more substantiated information of IWMIS, interviews were carried out with KIs and the following were discovered:-

Automation vs. Manual systems

There is use of both manual and automated systems at MWE. However, much of the system used is basically manual (file based system) that may constitute 60% leaving only 40% for the automated system (IT- based systems).

Departmental disharmony

Each department choose its own way of managing information. Some opt for manual/file system while others employ automated systems. This creates a disharmony in the entire ministry and thus making it hard to retrieve or disseminate information across all the departments.

Data management

There is a challenge of data management in the entire ministry. This ranges from capture of data, sorting, processing, storage and dissemination. Too much of manual system is being employed and being manual, time becomes a challenge as delays are likely to be met.

The quantitative results indicated that automated systems are not used in collecting data necessary for MWE, the employed data collection methods at MWE are not flexible, data sorting and organizing is done manually, data storage is based on the file system and limited degree of factual based decision making at MWE. The qualitative findings indicated that there is use of manual systems is highly pronounced than automated systems at MWE. , departmental disharmony as each department chooses its own way of managing information, presence of a challenge of data management in the entire ministry ranging from capturing of data, sorting, processing, storage and dissemination as it is based on manual systems.

From both findings; the quantitative and qualitative findings, it has been discovered that data management is highly done on manual systems which is in most cases inefficient at every stage hence ineffectiveness in decision making processes as they are largely dependent on information.

CHAPTER FIVE

SUMMARY, DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the findings generated from the study, discussions, conclusions and recommendations to IWMIS in MWE. Under this chapter, the areas for further research have been highlighted.

5.2 Summary of findings

The summary of the findings is presented with respect to the study objectives as follows:

5.2.1 The effect of performance expectancy on the implementation of an IWMIS of MWE

It was realized that performance expectancy creates anxiety among the employees, creates space to estimate the performance of an innovation, there is lack of motivation at an individual level which affects the diffusion of IWMIS throughout MWE, lack of rewards provided to employees to enable them adopt an innovation, and lack of positive information about an innovation and so that they can get to be part of it. In the correlations, performance expectancy was discovered to have a positive relationship with Integrated Water Management Information System meaning that as performance expectancy improves, IWMIS will also improve.

5.2.2 The effect of effort expectancy on IWMIS in MWE

It was found out that employees at MWE find it hard to use an innovation that is introduced because they lack information about it and this affects its utilization. The users of an innovation (employees) first take time to weigh the required efforts to use an

introduced innovation on top of having a belief in achieving results before taking an action. Whenever employees try out to use an innovation, they rarely get feedback that would help them gauge their progress and adjust to the requirements. Employees also lack knowledge and skills that would enable them use an innovation. There is also a challenge of goals not set to motivate employees to take action to achieve the goals in MWE. Too much weight is attached to the ministry's role and this tends to ignore the incorporation of an IWMIS. Costs of trained personnel and equipment were also identified as another setback for IWMIS. In the correlations, effort expectancy was found to have a positive relationship with IWMIS implementation meaning that if effort expectancy improves, IWMIS also increases.

5.2.3 The effect of facilitating conditions on IWMIS in MWE.

It was discovered that there are policies in MWE that support innovations but don't specify the exact actions that need to be undertaken, lack of a well-established structure that supports innovations and limited software programs at MWE that support innovations were noted as hindrances to IWMIS. There is also a challenge of having all employees being knowledgeable in utilizing IT systems plus limited number of IT specialists employed in the ministry. The training offered to staff is too basic which is only limited on how to use internet, intranet and word processing leaving out the management ISs. The equipment associated with IT equipment like computers and internet requires continuous and constant up-grade which is usually costly. In the correlations, facilitating conditions were found out to have a positive relationship with IWMIS meaning that as facilitating conditions increase, IWMIS also increases.

5.3 Discussion

5.3.1 The effects of performance expectancy on IWMIS in MWE.

The findings realized that performance expectancy has an effect on IWMIS. This is because it creates anxiety among the employees, creates space to estimate the performance of an innovation, lack of motivation at an individual level, lack of rewards to employees to adopt an innovation and lack of positive information about an innovation and so that they can get to be part of it. This is in agreement with Vroom (1964) as cited by Grant and Shin (2011) who stated that for an individual to choose between alternatives that involve uncertain outcomes, it seems clear that his/her behaviour is affected not only by his preferences among these outcomes but by the degree to which he/she believes these out comes to be possible. More in agreement with the findings is Condrey (2005) who pointed out that when an innovation gets exposed to people, estimations of its performance is made that will make it go on for some time before being utilised. Subba (2000) talked about the rewards as important towards enabling people use an innovation. The study found out that at MWE, rewards are not provided to employees that would otherwise enable employees adopt and utilise an innovation.

5.3.2 The effects of effort expectancy on IWMIS in MWE.

The findings found out that effort expectancy affects IWMIS in MWE. The study realized that employee at MWE find it hard to use an innovation that is introduced because they lack information about it and this affects its utilization, weighing of the required efforts to use an introduced innovation to estimate the results, lack of feedback, lack knowledge and skills and lack of goals set to motivate employees make it hard for IWMIS to find its

way into MWE. This is in agreement with Vroom (1964) pointed out that employees choose to invest effort in courses of action by weighing their relative utilities focusing on their probabilities of achieving desired outcomes. More discovered in the study is the lack of difficult, specific goals that produce effects when employees are committed to them and receiving feedback that would help gauge progress and adjusting effort which is in agreement with Porter & Lawler (1968). According to Ashford et al. (1998); Mitchell & Daniels (2003); Staw (1984), effort creates a picture of how employees actually make decisions and experience motivation. Eisenberger's (1992) explained that employees are rewarded for effort over time; hard work can take on secondary reward properties, such that employees naturally enjoy the very experiencing of expending effort. These also concur with the findings the study came up with.

5.3.3 The effect of facilitating conditions on IWMIS in MWE.

The study findings realized that facilitating conditions have an effect on IWMIS in MWE. This was so as policies in MWE that support innovations but don't specify the exact actions that need to be undertaken, lack of a well-established structure that supports innovations and limited software programs at MWE that support innovations as hindrances to IWMIS. A challenge of having all employees being knowledgeable in utilizing IT systems plus limited number of IT specialists employed in the ministry was discovered. Training offered to staff was found to be too basic which is limited on how to use internet, intranet and word processing leaving out the management ISs. The equipment associated with IT equipment like computers and internet requires continuous and constant up-grade which is usually costly. This is in agreement with Venkatesh et al., (2003) that pointed out the need of technical infrastructure in an organization to support

use of the system that meets challenges at MWE. More lacking at MWE that was discovered by the study is the availability of hardware, software, knowledge, time, data, finance, support and documentation as facilitating conditions to the utilization of an information system which is in agreement with Mathieson (2001) as perceived support resources for an innovation.

5.4 Conclusions

5.4.1 Conclusions on performance expectancy and IWMIS

From performance expectancy and IWMIS at MWE, lessons were learnt in the course of the study that led to the following conclusions:

In order for an innovation to be embraced in an organization, its usefulness became a concern to the employees. In case its usefulness is not established, it creates some anxiety among the employees which creates time of studying it hence delaying its implementation.

As an innovation comes into an organization, its results are estimated before being tried out.

The role of individuals in the implementation of an innovation was also established in the study as they are a primary entry of an innovation.

Rewards are also vital in enabling employees to utilize an innovation in an organization.

When all these are combined, they have an impact on the implementation of an innovation within an organization.

5.4.2 Conclusions on effort expectancy and IWMIS

The study among other objectives was to establish how effort expectancy affects the implementation of an IWMIS of MWE in Uganda. In the process of undertaking the study, lessons were drawn in the effort expectancy and IWMIS as follows:

Due to lack of information, employees usually find it hard to use an innovation that is introduced in an organization and this calls for training so that they are in position to utilize it.

When an innovation comes into an organization, employees first take time to weigh the required efforts to use an introduced innovation. This is coupled with a tendency of employees' belief in achieving results before taking an action.

In order to facilitate the implementation of an innovation, a manager should take an initiative to ensure that feedback is given to employees so that they can gauge their progress and adjust in their efforts.

Use of rewards is vital in compelling employees of an organization to adopt and utilise an innovation.

Organizations usually find it hard to adjust in order to implement an innovation. This is because they usually allocate a lot of time and resources to the already existing roles and responsibilities. In most cases, some innovations like IWMIS needs a lot of time to study and a lot of resources to purchase the required equipment and personnel. These take a crucial percentage of an organization's budget on top of the time required hence a tendency of diverting an organization from its roles thus leading to less attention to an innovation.

5.4.3 Conclusions on facilitating conditions and IWMIS

In studying the effects of facilitating conditions on IWMIS, the following was discovered:

Whenever an organization designs policies that support innovations, these policies should create a clear direction as to what decisions and actions should be undertaken not leaving people or department within an organization take on its own way of doing things hence creating disharmony.

Established structures in an organization create an atmosphere that is conducive to the adoption of an innovation. These structures are the ones that spell out who and what responsibility should be undertaken.

Training provided to employees to empower them to utilize innovations should be geared towards the requirements of that innovation. For the case of IWMIS, employees at MWE who are not necessarily IT specialists are provided with training that is too basic limiting itself to the operation of communication systems that are computer based leaving out the management element within information management. This leaves the trainees in balance as they are only limited to the basics not detailed training that would empower them undertake the necessary steps in information management.

5.5 Recommendations

5.5.1 Recommendations on performance expectancy and IWMIS

The study findings realized that performance expectancy creates anxiety among the employees, creates space to estimate the performance of an innovation, there is lack of motivation at an individual level which affects the diffusion of IWMIS throughout MWE, lack of rewards provided to employees to enable them adopt an innovation, and lack of positive information about an innovation and so that they can get to be part of it.

It is therefore recommended that rewards such as recognition, promotion and financial incentives be established in MWE to employees who exhibit a lot of involvement in trying out and delivering results from an innovation in order to motivate them take innovations on. Management should also endeavor to encourage employees to learn how to be creative so that they can take on innovations and learn with hands on experience rather than waiting to study an innovation and estimating its results which somehow delays the adoption. The aspect of how needs to be addressed as well

5.5.2 Recommendations on effort expectancy and IWMIS

It is recommended that mentoring should be a continuous process instead of waiting for a specific session to train employees on how to use an innovation. Those that are well conversant with an innovation should work as mentors to those that are less knowledgeable. Whenever employees try to use an innovation, there should be constant positive feedback to them so that they can be helped to adjust in their efforts and progress.

5.5.3 Recommendations on facilitating conditions and IWMIS

It is therefore recommended that a shift of a designated IT department be dissolved and instead have the IT personnel be incorporated into different departments so that they can continuously train other staff 9 in information management and help these different departments coordinate with each other which will result into a well-established structure that cuts across all the departments that will see a developing IWMIS.

5.6 Areas for further study

In the process of undertaking the study, some gaps were identified by the researcher. These gaps are therefore recommended by the researcher to be undertaken by other

researchers/scholars in order to be filled up. The identified gaps that should work as areas for further studies include:

- None financial factors and IWMIS
- Organizational learning challenges and IWMIS
- Factors that affect transformation from old systems to new systems and IWMIS
- Organizational structures and IWMIS implementation

5.7 Limitations of the Study and how they were addressed

In the process of data collection, a lot of challenges were encountered by the researcher and these included the following:

- What the structure of MWE presents is not fully filled by the staff and this affected the sampling.
- Some of the staff members were hesitant to avail themselves for the study.

However, these were overcome as the researcher obtained the actual number of staff currently in the Directorate of Water Development and took a sample from it. Secondly, an introductory letter from UMI helped introduce the researcher who went ahead and sought another written authority from the PS which eased work through accessing different offices and the respondents were assured that the information thought was strictly confidential.

REFERENCES

Amin, M.E. (2005). Social Sciences Research-Conception, Methodology & Analysis. Kampala, Makerere University Press.

Ashford, S. J., Rothbard, N. P., Piderit, S. K., & Dutton, J. E. (1998).Out on a limb: The role of context and impression management in selling gender-equity issues. Administrative Science Quarterly, 43, 23-57.

Bandura, A. (1986). Social foundation of thought and action: A social cognitive theory. New Jersey: Prentice- Hall

Barifaijo M., Basheka B. and Oonyu J. (2010). How To Write A Good Dissertation/Thesis- A Guide To Graduate Students. The New Vision Printing & Publishing Co. Ltd- Kampala.

Bertalanffy, von, L. (1968).General systems theory. New York: Braziller. Available on http://www.utwente.nl/cw/theorieenoverzicht/Theory%20clusters/Communication%20Processes/System_Theory/ 2nd September 2014 6:40pm

Condrey S.E., (2005, p. 482). School of Management. Yale University. Available on: http://www.som.yale.edu/Faculty/vhv1/

Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology, MIS Quarterly, 13(3), 318-339.

Diamond J. And Khemani P. (2005): Introducing Financial Management Information Systems in Developing Countries. Available on https://www.imf.org/external/pubs/ft/wp/2005/wp05196.pdf Accessed on 3rd October 2014, 09:12am

Denscombe, M., (1998) The Good Researcher Guide. For Small Scale Social Projects, Open University Press, UK.

Eisenberger, R. (1992). Learned industriousness. Psychological Review, 99, 248–267.

Ghana Statistical Service (2010): Available on http://www.statsghana.gov.gh/IMIS.html Accessed on 2nd October 2014, 12:43pm

Grant, A. M. (2008b). The significance of task significance: Job performance effects, relational mechanisms, and boundary conditions. Journal of Applied Psychology, 93, 108-124.

Grant, A. M., & Shin, J. 2011. Work motivation: Directing, energizing, and maintaining effort

(and research). Forthcoming in R. M. Ryan (Ed.), Oxford handbook of motivation.Oxford University Press.

Hackman, J. R., and Oldham, G. R. (1976). Motivation through the design of work: Test of a theory. Organizational Behavior and Human Performance, 16, 250-279.

HM Government (2011): Information Principles. Available on http://www.Information_Principles_UK_Public_Sector_final Accessed on 2nd October 2014, 11:23am

Krejcie, R.V., and Morgan, D.W. (1970) Determining Sample Size for Research Activities. National Emergency Training Centre.

Locke, E. A. and Latham, G. P. (2009). Has goal setting gone wild, or have its attackers abandoned good scholarship? Academy of Management Perspectives, 23, 17- 23.

Locke, E. A., Motowidlo, S. J., and Bobko, P. (1986).Using self-efficacy theory to resolve the conflict between goal-setting theory and expectancy theory in organizational behavior and industrial/organizational psychology. Journal of Social & Clinical Psychology, 4, 328-338

Mallach, E. G. (1994).Understanding Decision Support Systems and Expert Systems. Boston, Massachusetts: Irwin.

Mathieson, K., Peacock, K. M. E. and Chin, W. W. (2001). Extending the Technology Acceptance Model: The Influence of Perceived User Resources, The DATA BASE for Advances in Information Systems. 32(3), 86-112.

Matovu J.(2006): Towards Management Information System in public administration in Uganda. Available on http://hdl.handle.net/10530/116 Accessed on Accessed on 3rd October 2014, 10:32am

McClelland, D. C. (1961).The achieving society. New York: Van Nostrom Reinhold.

Ministry of water and Environment (2011): National Framework for Operation & Maintenance of Rural Water Supplies in Uganda

Mitchell T. R., and Daniels, D. (2003). Motivation. In W. Borman, D. Ilgen, and R. Klimoski (Eds). Handbook of psychology, vol. 12: industrial/organizational psychology (pp. 225–254). New York: Wiley.

Moore, G.C. and Benbasat, I. (1991). Development of an Instrument to Measure the Perceptions of Adopting an Information Technology Innovation, *Information Systems Research* (2:3), pp.192-222.

Mugenda, O., and Mugenda, A.G., (1999) Research Methods. ACTS Press, Nairobi

Nungu N., Sambo A., Smidt M. And Chokoe (2012): The Establishment of a National Integrated Water Information System (NIWIS) for South Africa: The Process and Provisional Results; Department of Water Affairs, Pretoria, South Africa

Oso, W.Y. and Onen, D. (2009) A General Guide to Writing a Research Proposal and Report. Jomo Kenyatta Foundation, Kenya.

Porter, L. W., and Lawler, E. E. III.(1968). Managerial attitudes and performance. Homewood,

IL: Dorsey Press.

Power, D. (2003).A Brief History of Decision Support Systems, (Online), Available http://DSSResources.COM/history/dsshistory.html, version 2.8 [14 March 2015].

Rogers, E.M. 1995. Diffusion of innovations 4th edition. The Free Press. New York

Saunders M, Lewis P and Thornhill A (2000): Research Methods for Business Students

Sauter, V. (1997). Decision Support Systems: An Applied Managerial Approach. USA :John Wiley & Sons, Inc.

Sekaran, U (2003) Research Methods for Business Skills Approach, John Willey and Sons, New York.

Sherri L. (2009): Research Methods & Statistics, Critical Thinking Approach, 3ed, Wardsworth

10 Davis Drive Belmont,CA94002-3098 USA

Sprague, R. H. and Watson, H. J. Eds. (1993). Decision Support Systems: Putting Theory Into Practice, 3rd Edition. Englewood Cliffs, New Jersey: Prentice-Hall.

Subba, R. P. (2000). Personnel and Human Resource Management – Text and cases; Himalaya Publishing House ISBN 81-7493-777-3

Staples, D. S., Hulland, J. S., and Higgins, C. A. (1998). A self-efficacy theory explanation for the management of remote workers in virtual organizations. *Journal of Computer Mediated Communication*, 3(4). Retrieved January 19, 2015, from http://www.ascusc.org/jcmc/vo13/issue4/wiesenfeld.html

Staw, B. M. (1984). Organizational behavior: A review and reformulation of the field's outcome variables. Annual review of Psychology, 35, 627-66.

Stone, R. W. and Henry, J. W. (1998). Computer self-efficacy and outcome expectations and their impacts on behavioral intentions to use computers in non-volitional settings. Journal of Business and Management, (1), 45-58.

Venkatesh, V., Morris, M., Davis, G. and Davis, F. (2003). User Acceptance of Information Technology: Toward a Unified View, MIS Quarterly, 27(3), 425-478.

Turban, E. and Aronson, J.E. (2001).Decision Support Systems and Intelligent Systems.6th Edition. Upper Saddle River, New Jersey, USA: Prentice Hall.

Venkatesh, V. (2000). Determinants of Perceived Ease of Use: Integrating Control, Intrinsic Motivation, and Emotion into the Technology Acceptance Model, Information Systems Research, December, 1(4), 342-365.

Vroom, V. H. (1964). Work and motivation. New York: Wiley.

Water and Environment (2008): Sector Performance Report

Water and Environment (2009): Sector Performance Report

Water and Environment (2010): Sector Performance Report

Water and Environment (2011): Sector Performance Report

APPENDIX I
QUESTIONNAIRE

Dear respondent, my name is Loy Asiimwe. I am a Masters student at Uganda Management Institute pursuing a Master's Degree in Management Studies. I am gathering information about factors influencing the implementation of an Integrated Water Management Information System of Ministry of Water And Environment, Uganda. This is to request for your contribution towards my study by participating as a respondent. The information you will give is confidential and is not binding. Your participation is highly appreciated.

A. Background information

1. Gender: Male ☐Female ☐

2. Age: 20-29 ☐30-39☐40-49☐ 50-59☐Above 60 ☐

3. Education level: Tertiary ☐ Bachelors ☐ Post graduate ☐

4. Time spent with ministry of water so far < Year☐1-4 Years☐5-9 Years ☐10>☐

5. Department: Urban Water Supply and Sanitation department ☐ Rural Water Supply and Sanitation ☐ Water for Production Department ☐ Water & Environment Sector Liaison department☐

Section B Influencing factors (Independent Variables)

In the following sections, you are required to give your response by ticking Strongly; Agree- 5, Agree- 4 Neutral- 3, Disagree-2, and Strongly Disagree-1

Performance Expectancy

		5	4	3	2	1
6	Usefulness of an incoming innovation/information system is a concern in this ministry					
7	There is always an estimation of results of an innovation/ information system in this ministry					
8	Individuals' expectancy towards an innovation motivates them in this ministry					
9	Individuals can be motivated if they believe in positive results out of an innovation					
10	Control and policies in this ministry are associated with the individual's expectations out of a new innovation					
11	Rewards are provided to employees in order to adopt and use an innovation in this ministry					
12	Employees will accept an innovation if they believe it is of benefit to them					

Effort Expectancy

Please, give your response by ticking Strongly; Agree- 5, Agree- 4 Neutral- 3, Disagree-2, and Strongly Disagree-1

		5	4	3	2	1
13	It is usually easy for employees here to use an introduced innovation					
14	Employees first take time to weigh the required efforts to use an introduced innovation					
15	Employees have a belief in achieving results before taking an action					
16	Employees get feedback to gauge their progress and adjust effort while doing any task					
17	The employees usually have knowledge and skills to use any introduced innovation in this ministry					
18	Difficult goals are set to motivate employees to take action if they believe such action have the potential to achieve the goals in this ministry					

Facilitating conditions

Please, give your response by ticking; Strongly Agree- 5, Agree- 4 Neutral- 3, Disagree-2, and Strongly Disagree-1

		5	4	3	2	1
19	There are policies that support innovations/new systems in this ministry					
20	Policies that support innovations/new systems in this ministry are well implemented					
21	There is a well laid down structure that provides for innovations/new systems in this ministry					
22	Software programs that support innovations are present in this ministry					
23	There is availability of databases that enable the implementation and utilization of an innovation in this ministry					
24	Training is provided to employees to empower them utilize innovations					
25	Employees are supported to utilize innovations in this ministry					

Section C: Integrated Water Management Information System (Dependent Variable)

Please, give your response by ticking; Strongly Agree- 5, Agree- 4 Neutral- 3, Disagree-2, and Strongly Disagree-1

		5	4	3	2	1
26	Automated systems are used in collecting data necessary for the ministry					
27	The current systems used in data collection are flexible					
28	Data sorting and organizing is done manually					
29	File system is employed in storing of the ministry's data					
30	Automated systems are in place to store the ministry's data					
31	There is adequate and sufficient methods of backing up data in this ministry					

32	Decision making in this ministry is largely fact based					
33	The stored information is widely utilized in decision making					
34	There is timely feedback in this ministry due to a well-established Integrated Water Management Information System					

THANK YOU FOR YOUR TIME AND PARTICIPATION

APPENDIX II

INTERVIEW GUIDE

Dear respondent, my name is Loy Asiimwe. I am a Masters student at Uganda Management Institute pursuing a Master's Degree in Management Studies. I am gathering information about factors influencing the implementation of an Integrated Water Management Information System of Ministry of Water And Environment, Uganda. This is to request for your contribution towards my study by participating as a respondent. The information you will give is confidential and is not binding. Your participation is highly appreciated.

1. How would you rate the usefulness of an integrated water management information system? (probe for the perceived expectations and improvement the IWMIS can bring in the ministry)

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2. What are the perceived likelihoods that the IWMIS can easily be used in this ministry? (probe for both positive and negative situations currently and expected at the ministry)

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3. What present conditions in this ministry that are supportive to the implementation of the IWMIS? (probe for Organizational ICT policies, Technical ICT infrastructure, Software, Databases, Training and support)

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4. What do you think is the state of the current Integrated Water Management Information System within this ministry?

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THANK YOU FOR YOUR TIME AND PARTICIPATION