

**EFFECTIVENESS OF ERP APPLICATION IN THE PROVISION
OF EFFICIENT AND QUALITY PUBLIC SERVICES IN
TANZANIA: A CASE OF TANGA UWASA**

By

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**A Dissertation Submitted to Mzumbe University School of Business in Partial
Fulfillment of the Requirements for Award of the Master of Business
Administration Degree (MBA Corporate Management)
of Mzumbe University**

2014

CERTIFICATION

We, the undersigned, certify that we have read and hereby recommend for acceptance by the Mzumbe University, a dissertation entitled **Effectiveness of ERP Application in the Provision of Efficient and Quality Public Services in Tanzania: Case Of Tanga UWASA** , in partial/fulfilment of the requirements for award of Master of Business Administration (MBA Corporate Management) of Mzumbe University.

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ACKNOWLEDGEMENT

I would first like to thank Almighty God for always guiding me in accomplishing my goals. I would like to extend my gratitude to my family members for their unconditional and continued support. My heartfelt thanks go to my mother who continued to be the source of encouragement and inspiration to me through the months of writing.

Many thanks go to staffs, officials of Tanga UWASA and all the respondents who participated in this study.

Lastly, I wish to extend humble acknowledgement with sincere gratitude to my supervisor Jones A Mnzava for his advises and guidance during the writing of this research study. Thanks for the opportunity to use your time, persistent criticism that brought hope and confidence, access to knowledge and resources during the completion of this research study.

In addition, I wish to thank Mzumbe Business School for the excellence in tuition, their desire and guarantee towards academic and business excellence. You have made a noteworthy and meaningful contribution to my life, my work and future career for which I am grateful.

DEDICATION

This research study is lovingly dedicated to my mother, who has always been my constant source of inspiration. She has given me the drive and discipline to tackle any tasks with enthusiasm and determination, without her love and support this research study would not have been made possible.

ABSTRACT

The objective of this study is to assess the Effectiveness of ERP Application in the provision of efficient and quality public services in Tanzania: Case of Tanga UWASA.

Based on the objective and research questions, the research instruments such as questionnaires, interviews, observations and documentary reviews were used so as to get information that addresses the issue under study. The research instruments contained specific questions that answered research questions directly and other general questions that had no direct reflection to the objective of the study, but added value to the research.

Data were analyzed according to research questions which guided the study with support of tables and graphs. Both quantitative and qualitative techniques were used to analyze the data.

Findings of the study show that the information technology is a key to performance of the Tanga UWASA and this is likely to boost growth of the organization. Specifically the ERP software was found to be effective in attainment of efficiency and quality objectives of Tanga UWASA.

This study recommends and suggested that investment in information and communication technology should be key component in overall strategies. This will allow IT providers to market their innovations well hence better services for the public.

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LIST OF ABBREVIATIONS

ATM	-	Automated Teller Machine
ERP	-	Enterprise Resource Planning
ICT	-	Information Communication Technology
IT	-	Information Technology
MIS	-	Management Information System
UWASA	-	Urban Water Supply and Sewerage Authorities

CHAPTER ONE

INTRODUCTION AND PROBLEM SETTING

1.1. Introduction

This study intends to determine the impact of effective employment (in terms of appropriate level of technology and standard) and utilization (in terms of the right knowledge, technical expertise and fulfillment of important roles required of) of the Enterprise Resource Planning (ERP) model of Management Information Systems (MIS) to the improvement of the quality of customer service operation in the water sector in Tanzania. A case of Tanga Urban Water Supply and Sewerage Authority (Tanga UWASA) is considered for reasons such as the easy of conducting the study in relation to the opportunity of sourcing research data, cost, and the fact that the Authority is one of the icons in performance measures in the water sector rated by the Ministry of Water and EWURA.

The research would also benefit the Authority as an empirical study in bridging up the gaps in its information management gaps hence improvement of the utility's service quality improvement

1.2. Background Information

The Government of Tanzania in 1998 made an official move to the formation of the Urban Water Supply and Sewerage Authorities which were a purpose reformation of what was initially known as District Water Departments, operating under the respective District Councils with the patronage of the Regional Water Engineer from the Regional Commissioner's Office in the respective region.

In the statement by the Memorandum of Understanding (MoU) for operation of these Authorities, the utilities were established on 1st July, 1998 as per Section 3(1) of the Water Works Act No. 8 of 1997 as a move to enhancing water and sanitation service provision in each of the respective District, the three Municipalities of

Tanga, Arusha and Moshi, (by then) being the pilot implementation for Mainland Tanzania.

It was declared that these Authorities would operate autonomously with no strings attached to the Municipal and Regional Administration organs in the respective area, and would report directly to the Director of commercial Operation for Waters and Sewerage Services in the Ministry of Water, and were expected to operate commercially within their respective Authority scope.

According to the 2008-2009 Operational Audit Report of Tanga UWASA, the utility's operation and main business is to produce clean and safe water, efficiently distribute water to the residents of Tanga City, effectively collect the sewage from the City, conduct effective customers support program, maintenance and repair (service) of the water and sanitation infrastructure and bill the customers in terms of their consumed services.

As every business entity would - in its day to day activities - involve the use and manipulation of data and information to run its endeavors, the Tanga UWASA use different types and sets of data and information in its daily activities ranging from historical, cross-sectional, current to prospective information about processes, customers, investments, risks, research, products, services, economy and market trends in general just as Gaber and El-Tawel (2011) insist that Management Information system can help all kinds of businesses improve the efficiency and effectiveness of their business processes, managerial decision making and work group collaboration, thus, strengthening their competitive positions on a rapidly changing market plan.

The easy and the economy with which any Utility would use and process different types of information for efficient and effective operation of the organizational activities would normally depend on ownership, the level of application, the technology involved, the knowledge of its employees, the voluntarily versus

involuntarily nature of the utilization and the importance borne with the respective organization of the Management Information System (Ministry of Water and Irrigation 2010).

Since time in memorial, before the application and use of technologically advanced Management Information Systems currently in place, Tanga UWASA has been in use of different types of data and information archiving systems which were changing phase, technology wise, and in terms of advancement that were from time to time occurring and adopted from the general environment. Manually operated Management Information Systems were in place way before the inauguration of the Authority in different operational set-ups and as time went, different forms and levels of automation depending on the growth of technology and the advancement of technology application, featured different systems that were in use in Authority's different operational set-ups.

As UWSA's ICT Audit Report (2007) identifies, a number of systems were established covering the application in activities such as Human Resources and Administration (for employees and administration issues recording and archiving – JP First Human Resources Management software), Accounting and Stores (for accounting and stores recording, transaction processing and reporting – Access Horizon Accounting Package, Tally *ies* Accounting Package and Vision Accounts), customers services operation (for customers' different information keeping and processing – Perfect Bill software), billing and credit control (for customers billing and debts management – Perfect Bill software), meter movement management (for customer water meter movement management and reporting – Perfect Bill software), engineering and plant maintenance (for information relating to infrastructure designs, pipe networks maps and various technical standards for operation and maintenance – Perfect Bill software, AutoCAD, Pipe Mate and CMMS).

In 2000, as part of the Government's restructuring initiative, the Authority – as the pilot implementation of the restructuring process-was one of the Authorities that

were granted a Database Management System that was intended to facilitate effective handling of data and information in the work areas relating to the customer registration, engineering, bill processing, customer complaints follow-ups, meter management, credit control and accounting.

Different kind of systems in the Authority to date account for various application packages that are used by the employees in various work sections to process data, reporting and decision making regarding operations, problem solving and investments.

A presence of the researcher in the Authority found the implementation of segments of automated Management Information Systems like data packages that do not integrate thus aggregating to the issue of manual data and information sharing between parties whenever reference has to be made by combining sets of information packets and this seem to be the general trend in almost all utilities in the country with variations in data management tools standards within each Authority and from one Authority to another, a typical example of the situation being observed from the Tanga, Arusha and Moshi UWSA's where not only each respective Authority using packages which are not compatible with one another based on different standard features and development technology used, but also the Authorities feature the use of different software even in functions and operational set-up of the same standard of activities like Accounting, where Arusha UWSA employ the use of Pastel Evolution Accounting package, Moshi UWSA using Tally *ies* accounting Package and Tanga UWASA engaging in the transformation from Tally to Vision Accounts software, by the time of visit having being in use of Access Horizon Accounting package previously.

The Need for Efficient and Effective Information Systems in Business Processes

Every business can be seen as a collection of business processes. Business processes refer to the manner in which work is organized, coordinated, and focused to produce a valuable product or service. A business process is a collection of activities

designed to produce a specific output for a particular customer or market. It implies a strong emphasis on how the work is done within an organization, in contrast to a product's focus on what. A process is thus a specific ordering of work activities across time and place, with a beginning, an end, and clearly defined inputs and outputs: a structure for action with a goal, specific inputs, outputs, uses resources, a number of activities that are performed in some order, affect more than one organizational unit and creates value of some kind for the customer or stakeholders (Enterprise Architect, 2004).

Laudon and Laudon (2010) assert that most business processes in the business world today depend on the effective use and application of the data and information, as a key resource, that are well processed, stored, interpreted, can transact timely, and rich for effective decision making.

The dependency of effective and efficient operation of businesses, from investment decision making to customer complaint resolution, on the application of Management Information System is vitally high in terms of real time, highly simplified and interpreted data and information support.

The Authority in study, owns various types and segments of Management Information System packages which are primarily ineffective in terms of their failure to support effective and quick support for data and information needs in all kinds of operations and management processes, be it decision making, problem solving, process appraisal etc.

The need for information in relation to different kind of operational processes in Tanga UWASA and the organizations of the like is of a certain quality if these entities are to operate at a high quality demanded and expected by their customers and the market at large.

Since their institution in operation, the Authorities inherited from the then inefficiently operated water departments of most of their operational ways including the data storage and management systems and in-turn their use to foster processes, problem solving, decision making and even development purpose, has not been to

the extent of pushing the Authorities' managements to run business efficiently to the tune of providing quality services as expected.

An effective and efficient organization relies on the availability of accurate, timely and relevant information for various short term and long term requirements. Laudon and Laudon (2010) add that an effective information system provides users with accurate, timely and relevant information. Needless to say, the situation of Tanga UWASA's information management as depicted by the ICT Audit report for Tanga , Arusha and Moshi UWSA's (2007) is unhealthy to support an operation of a 21st Century organization operating in an environment needing quality service provision that necessitates the need of quality of data and information to support the operation in general.

Poor operational results and continued customer complaints are symptoms of sub-standard operation which is catalyzed among many things by the Authority's poor system of managing and utilizing information for various organizational purposes. An analysis of the situation revealed some issues that have risen to be the problem area that need rectification after the causes and mitigation measures have been identifies and recommended respectively;

- Customers complain on the late deliveries and incorrect water bills
The problem of late customer bills processing and a good number of them bearing incorrect figures (statistics) gearing-up a lot of complaints from the customers have been around the Authority for long and has grown to the tune of tarnishing the utility's image to the public, but all as a result of not having an information system that would keep errors to the minimum or eradicate them altogether
- Staffs lament on incorrectness and variations of their personal information between departments and many a times distorted or mixed amongst employees, a problem catalyzed with the use of an information system that fails to integrate all the information that is necessary to be linked to bear appropriate meaning.

- Inability to make to make clear in-time judgments about customers and staff during problem solving.
- Management fails to make proper and effective decisions about operational and investment issues of different kinds as a result of failure to obtain information relevant for performing different types of operational and investment analyses.
- Ministry of Water (as the Authorities' owner-overseer) together with EWURA (the Country's Relevant Regulator to the sector) lack appropriate information to make effective reviews and appraisals of the respective utilities operation when required.

In contemporary systems there is a growing interdependence between a firm's information systems and its business capabilities. Changes in strategy, rules, and business processes increasingly require changes in hardware, software, databases, and telecommunications. Often, what the organization would like to do depends on what its systems will permit it to do (Laudon and Laudon, 2010). The quality of the service provided to the customers and the public in general of any organization depends considerably on the decisions made and the avenues identified of resolving the problems and difficulties around the service provided. Customers and the public tend to value organizations importance and reliability in terms of the rightful and deserved level of service quality that they expect in comparison to what they are offered. All this is dependent on the level of accurate, timely and relevant information that the organization's management and staff obtain for various operational requirements including the major ones such as decision making and problem solving while this is directly associated with the ease and the economy with which quality information is obtained and the appropriate level application of information management and processing tools that cope with the required standard in the trend of technological development and the level of appropriateness and relevancy required of the data and information within the organization in question.

1.3 Statement of the Problem

Despite the application of Enterprise Resource Planning by Tanzanian Water Supply and Sewerage Authorities still there are many complaints from the customers on the quality of services provided. Thus this study intends to bridge the gap by empirically studying the impact of the Enterprise Resource Planning on efficiency and effectiveness of service delivery within the organization whereby Tanga UWASA has been taken as a case study.

1.4 Research Objectives

1.4.1 General Research Objective

The general objective of this research is to study the impact of the application of Enterprise Resources Planning by Tanzanian Water Supply and Sewerage Authorities in quest to improving operational efficiency and improve the quality of service provision to the water sector customers who are undoubtedly the Tanzanian public in general with the residential status in the respective areas of operations by the Government owned-operated Urban Water Supply and Sewerage Authorities.

1.4.2 Specific Research Objectives

The research entails the following specific objectives in relation to the attainment of the above objective;

- a.) To assess the ERP application capacity at Tanga UWASA
- b.) To determine the extent of ERP application at Tanga UWASA;
- c.) To determine the effectiveness of ERP in improving efficiency and quality objectives at Tanga UWASA.
- d.) To identify the problems affecting the effectiveness of the ERP software in attainment of efficiency and quality objectives of UWASA

1.5 Research Questions

1.5.1 The General Research Question

The general research question is tagged as:-

What is the relationship between the application of Enterprise Resources Planning for day to day operation and the improvement of service provision efficiency in

water utilities (Water Supply and Sewerage Authorities) in Tanzania?

1.5.2 Specific Research Questions

Several specific questions can be raised in order to derive answers that led to the achievement of the respective specific objectives of the research.

- 1) Does the Authority have the capacity to apply an ERP?
- 2) What is the extent of ERP application at Tanga UWASA?
- 3) What is the effectiveness of ERP in improving efficiency and quality objectives at Tanga UWASA?
- 4) What are the problems affecting the Effectiveness of the ERP software in attainment of Efficiency and Quality Objectives at Tanga UWASA?

1.6 Significance of the Research

This research is significantly conducted as a support to the effort of the Tanzanian Water Supply and Sewerage Authorities (UWSA's) to improve operation efficiency by employment the use of effective, timely and correct information to initiate actions/ transactions toward the conclusion of the decision and implementation.

In order for the Authorities to realize their pursued aim of operational efficiency improvement and service quality boost, it is undoubtedly they will employ advanced technology that relevantly supports the operational needs of these respective Authorities.

This research can also be used as a basis for further studies where different scholars may wish to use the results of this work as reference to their works or use it to develop the idea and research more on the matter.

1.7 Scope/ Delimitations of the Study

The scope of the study is bounded to the focus on the operation of the Urban Water Supply and Sewerage Authorities (UWSA's) particularly a case study is made from Tanga UWASA where most of/ considerable data and information was sourced to ease the conduct of the study and arrive at a conclusion which can provide

recommendations that can effectively fruit the improvement in the water sector situation of Management Information System utilization.

The researcher focused on one utility considering the fact that the conduct of the study is not only time involving which is limited, but also the issues relating to costs involved in travelling to other respective Authorities as these are scattered all over the country.

1.8 Limitation of the Study

A major limitation of this study was the availability of data since some documents in a UWASA are confidential. Also due to time constraint many respondents claimed to be busy with organization activities which result to low in response rate.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter provides the theoretical review and a review of what other researchers and writers have written under this topic of the study. It provides the reviews of previous studies related to the topic under study giving a summary of a specific area of research that allow anybody reading the paper to institute why researcher is pursuing a particular research. Specifically this chapter reviews literature related to the impact of effective ERP application on improving efficiency and quality of service in water utilities operation in Tanzania.

2.2 Theoretical Literature Review

2.2.1 Conceptual Definitions

This section provides the conceptual definitions of the technical terms used in this study. They include information technology, information system, enterprise resource planning, effectiveness and efficiency.

2.2.1.1 Efficiency and Effectiveness

Efficiency is the capability to attain objectives with less cost in terms of resources used.

Effectiveness is the ability to achieve the objectives. Effectiveness in this study is measured in terms of the ability of the ERP software in attainment of quality objectives of the authority which include attainment of high quality services to customers, high quality and efficient reports and capability to meet the managerial expectations.

2.2.1.2 Organizational Development

Organizational Management is in every way impacted with the information that should be used for different purposes including decision making, coordination, control, analysis, and visualization in an organization.

2.2.1.3 Data and Information

Data as defined by Feeny and Blake (1990) are streams of raw facts representing events occurring in organizations or the physical environment before they have been organized and arranged into a form that people can understand and make use of.

Information on the other hand is data that have been shaped into a form that is meaningful and useful to human beings for various reasons/ purposes (Feeny and Blake 1990).

2.2.1.4 Information Technology (IT)

Information technology is the acquisition, processing, storage and dissemination of vocal, pictorial, textual and numerical information by a microelectronics -based combination of computing and telecommunications.

Information technology is defined by Brynjolfsson (1994), as all the hardware and software technologies a firm needs to achieve its business objectives. Information technology is the area of managing technology and spans wide variety of areas that include but are not limited to things such as processes, computer software. Information systems, computer hardware, programming languages, and data constructs. In short, anything that renders data, information or perceived knowledge in any visual format whatsoever, via any multimedia distribution mechanism, is considered part of the domain space known as Information Technology (IT).

IT includes computers, information networks, on-line data bases and soft-ware as well as fax-machines, mobile phones, cable TV and other forms of personal and mass communication.

2.2.1.5 Information Systems (IS)

Information system is an an academic/ professional discipline bridging the business field and the well-defined computer science field that is evolving toward a new scientific area of study.

Gaber (1990) defines Information System as any organized combination of people, hardware, software communications, networks or data resources that stores,

retrieves, transform and disseminates information in any organization. It involves all components and resources necessary to deliver information and information processing functions to the organization.

According to the Laudons (1998), an IS can be defined as a set of procedures that collect (or retrieve), process, store and disseminate information to support decision making and control.

According to Eardley, et al (1995) an IS may be broadly defined as a series of interrelated activities concerned with the capture, processing, communication and conversion of data to information.

IS according to Hicks (1993), is a computerized system that can collect, store, process and report data from various sources to provide information necessary for management decision.

Different types of information systems make up a Management Information System for a typical organization, including Transaction Processing Systems (TPS) – example of which being a Payroll Software, Decision Support System (DSS) – example being a Ship Voyage-Estimating Package, and Executive Support System (ESS).

These types of information systems are explained as follows:

- **Transaction Processing Systems (TPS)** – is a computer-based information system that automate the handling of data about business activities or transactions, which can be thought of as simple, discrete events in the life of an organization.
- **Decision Support System (DSS)** - is a computer-based information system that supports business or organizational decision-making activities. DSSs serve the management, operations, and planning levels of an organization and help to make decisions, which may be rapidly changing and not easily specified in advance

- **Executive Support System (ESS)** - is a type of management information system intended to facilitate and support the information and decision-making needs of senior executives by providing easy access to both internal and external information relevant to meeting the strategic goals of the organization

2.2.2 The Relationship between Information Technology, Information System and Management Information Systems

Harrison et al (1995) point out that IT deals with supply and development of IS to the system. For this reason, IS is well defined under IT.

Hicks (1993) generally, define MIS as a system that provides information about routine and anticipated business events.

MIS has 5 components, which are People who do the work; procedures of getting the work done; models of how problems may be solved; information to be analyzed and equipment for processing information. This is according to Rachman, et al.(1990)

According to the Loudons (1998) MIS is a term with several meanings. It can be defined as a kind of system that helps managers with their planning, controlling and monitoring functions and support primarily structured decisions.

MIS is sometimes used to refer to all of those computing systems in the organization that support management. MIS is a field that fused computer technology with business applications.

It is clearly observed that MIS is well defined under IT. With the above definition, the whole text has used IT to stand for IT itself, IS and MIS.

2.2.3 The need for IT in organizations

The IT revolution has affected many industries in dramatic ways. Certainly, the technology promises very sophisticated possibilities and some futurists are certain that within the medium term whole areas of our lives will be transformed. Randal (1994: 53). In business, the application of the computer appears to have been slower until 1984 as Higgins and Opdebeeck researched it. Nine years later, a Price Waterhouse survey identified widespread use of computer for sales and marketing systems. Baker (1994: 362).

Developments in IT are also influencing the business environment. This technology has radically changed the ways in which companies interact with their customers. Baker (1994: 360)

IS and IT-have a long time been responsible for improving efficiency and cost-effectiveness and providing for information needs. These have contributed to the competitive advantage to many organizations. Harrison, et al (1995)

Competitive advantage can be defined as anything that favorably distinguishes your firm or its products from those of competitors in the eyes of customers or end users. These distinguishing factors can be enhanced by IT, such as reduced costs, better service through speed of response or information provision.

Competitive information comes in different forms and it is often considerable. A relational database, which brings information from different sources, allows a company to search for data on specific topics. This can provide a very useful way of combining the information from different services to develop competitive profiles.

Effective management of IT has a major influence on a company's ability to assess and respond to its competitive position. An effective computer-based approach can create substantial advantages in planning and controlling the business effort.

2.2.3 Enterprise Resources Planning (ERP)

2.2.3.1 Definition of ERP

Enterprise Resource Planning or ERP is a technological tool that attempts to integrate all departments and functions across an organization onto a single computer system. ERP systems typically include the following characteristics:

- An integrated system that operates in real time (or next to real time), without relying on periodic updates.
- A common database, which supports all applications.
- A consistent look and feel throughout each module.
- Installation of the system without elaborate application/data integration by the Information Technology (IT) department

Enterprise Resources Planning (ERP) or simply Enterprise System is defined as a system that integrates all of the organizations business functions into a single system, designed to serve the needs of each different function within the enterprise. In theoretical explanation, ERP is more of a methodology or an activity than a piece of software, although it does incorporate several software applications, brought together under a single, integrated interface.

Koch and Wailgum (2008) explains ERP as a technological tool that attempts to integrate all departments and functions across an organization onto a single computer system that can serve all those different departments' particular needs. It integrates the key business processes of an entire organization into a single software system that enables information to flow throughout the organization (Laudon and Laudon, 2010).

2.2.3.2 Benefits of ERP

ERP defeats the old standalone computer systems in different organizational business units like finance, HR, manufacturing and the warehouse, and replaces them with a single unified software program divided into software modules that roughly approximate the old standalone systems where all different units still get

their own software, except now the software is linked together so that someone in finance for instance, can look into the warehouse software to see if an order has been shipped and the like for effective and efficient operation to foster quality and competitive edge customer service.

Laudon and Laudon (2010) provide that business organizations are hierarchies consisting of three principal levels: senior management, middle management, and operational management. Information systems serve each of these levels. Using information system effectively requires an understanding of the organization, management and information technology shaping the systems. An information system creates value for the firm as an organizational and management solution to challenges posed by the environment.

The emergency of Enterprise Resource Planning (ERP) can bring about effectiveness in service delivery in public organizations.

Generally, the potential benefits of ERP are as follows;

- Improved efficiency in terms of time, human resource usage and costs can result.
Improved quality of information can be achieved, for example, in terms of accuracy, level of detail and timeliness.
- Greater flexibility and responsiveness to user needs can emerge;
- Increased access for users to all information sources, both within and outside the organization, can be significant.
- Increased efficiency may be achieved through the sharing of common databases, either within the organization or by using external sources.
- Improved effectiveness of communication both between members of the organization and with outside organizations and agencies.

Enterprise Resource Planning may also have the following advantages:

- It may integrate key customers and suppliers as part of the enterprise's operation.

- It provides integrated database and custom-designed report systems.
- It adopts a set of “best practices” for carrying out all business processes.

The potential benefits of ERP system may be categorized into internal and external benefits. These are mentioned below:

- Internal Benefits
 - Integration of a single source of data
 - Common data definition
 - A real-time system
 - Increased productivity
 - Reduced operating costs
 - Improved internal communication
 - Foundation for future improvement
- External Benefits
 - Improved customer service and order fulfillment
 - Improved communication with suppliers and customers
 - Enhanced competitive position
 - Increased sales and profits

2.2.3.3 ERP Implementation Approaches

ERP implementation approaches are:

- The big bang – install a single ERP system across the entire organization
- Franchising – Independent ERP systems are installed in different units linked by common processes, e.g., bookkeeping.
- Slam dunk – install one or several ERP modules for phased implementation of key business processes.

2.2.3.4 Major Phases of ERP Implementation

Major phases of ERP implementation are as follows:

- Initiation – develop business case, project scope, and implementation strategy
- Planning – establish implementation team, determine goals and objectives, establish metrics
- Analysis and process design – analyze and improve existing processes, map new processes to be adopted by the system
- Realization – install a base system, customization, and test the system
- Transition – replace the formal system with the new system, data conversion
- Operation – monitor and improve system performance, provide continued training and technical support

2.2.3.5 Major Challenges to ERP Implementation

Major challenges to ERP implementation include the following:

- Limitations of ERP technical capabilities
- Inconsistency with existing business processes
- Costs - implementation (hardware, software, training, consulting) and maintenance
- Impact on organizational structure (front office vs. back office, product lines, etc.)
- Changes in employee responsibilities
- Flexibility of software system upgrades
- Implementation timelines
- Availability of internal technical knowledge and resources
- Education and training
- Implementation strategy and execution
- Resistance to change

2.2.3.6 ERP Implementation - Key Enablers (APQC Best-Practice Report)

According to APQC Best-Practice Report the key ERP implementation enablers include the following:

- The organization is prepared for the change.
- The executive leaders are active and visible in their support.
- The initiative is seen as a business imperative by the organization.
- The resources are available to conduct the project completely.
- A good packaged system is used and not customized.
- The user group is trained to use the software before it is implemented.
- Project Management
 - Organizations link implementation teams to both the technical (IS) and functional departments.
 - They tightly control implementation processes
 - They appropriately use consultants throughout the implementation process
 - They manage turnover of key implementation employees
 - They have basic business reasons for implementation
 - They align implementation with organizational strategies
- Change Management
 - Redesigned jobs call for higher levels of skills and accountability
 - Change management is viewed as more than just increased training and communication
 - Enterprise-wide systems drive redesigned changes.
 - The executive sponsor is the change agent.
 - Resistance from the work force (including management) is the most significant obstacle.

- Technology Excellence
 - Organizations rely heavily on the ERP package as the majority of their application configuration.
 - Organizations implement ERP packages on time and within budget
 - Organizations centralize support groups within their IT departments

2.2.3.7 New Developments in ERP

The new developments in ERP include the followings:

- Availability of web-based and wireless ERP systems
- Adoption of easy-to-install ERP systems
- Linkage to other software systems, e.g., supply chain management system, e-commerce, customer relationship management system
- Availability of web-based and wireless ERP systems
- Adoption of easy-to-install ERP systems
- Linkage to other software systems, e.g., supply chain management system, e-commerce, customer relationship management system

2.3 Empirical Literature

A number of empirical works have been done regarding the effective organizational application of the Enterprise Resource Planning and the use of technologically advanced information systems to effect business operations and maintain customer satisfaction in terms of quality received by them. In its implication the concept is explained by several scholars.

Laudon and Laudon (2010) make a point that organizations typically have many different information systems built around different functions, organizational levels, and business processes that can not automatically exchange information. This fragmentation of data in hundreds of separate systems degrades organizational efficiency and business performance.

Davenport (1998) stresses that ERP systems integrate the business processes, operational data and financial data across the entire enterprise.

The conceptual function of ERP as laid out by Koch and Wailgum (2008) reflects a scenario that people in different departments will see the same information and can update it. When one department finishes with the order it is automatically routed via the ERP system to the next department. To find out where the order is at any point, one need only logs in to the ERP system and tracks it down. With this system, the order process moves with the speed of a lightning through the organization, and customers get their orders faster and with fewer errors than with the use of several stand alone applications.

ERP can apply that same magic to the other major business processes, such as employee benefits, financial reporting and public relations, customer services and managerial planning.

Enterprise resource planning (ERP) systems have been embraced by many organizations all over the world (Liang 2007). META Group (2004) hints in its research, the state of ERP services, that 80 percent of the Fortune 500 firms have adopted and implemented ERP systems. Furthermore, companies that implement the ERP systems have the opportunity to reengineer their business processes using models embedded in the software (Scheer and Habermann 2000). Through functional integration and business process reengineering, organizations aim to achieve higher operational efficiency and even strategic benefits into their main business and objective for establishment (Bhattacharya et al. 2010).

The success of effective application of ERP in any business organization though depends much on several factors embedded with the organization itself.

The major factor is the respective organization's management support. Bin et al. (2011) identifies management support to be critical to the success of information system in both the implementation period and the post implementation period as theorized and found by DeLone (1988)

According to Sabherwal et al. (2006), management support is defined as the favorable attitude toward and explicit support for IS success. Management support includes committing the sufficient allocation of resources, creating conducive environment, encouraging positive attitudes and helping overcome employees' resistance to the new system. There is also evidence of the importance of consultant or consultant effectiveness in IS literature (Soh et al. 1992). According to Simon (1990), consultants, with their expertise and experiences, are even more important for small organizations and start-ups, which do not employ internal IT staff or provide user training for employees. Finally, training has also been studied as a critical factor to IS success (Sharma et al. 2007). Through the training process, trainers can provide employees with technical knowledge, explain the application to the employees in a face-to-face manner, demonstrate how to use the system, resolve problems immediately and provide feedback (Yi and Davis 2003). Therefore, training enables employees to gain experience with and learn about the new system, which contributes to IS success (Nelson and Cheney 1987).

With a number of literature studying on important factors for successful implementation of IS, Bin et al. (2011) identify the following as the key factors to successful implementation of ERP, particularly from the perspective of the internal services (the IT department) of the respective organization provides;

- Department's Service Leadership Behavior,
- Department's Service Climate,
- Department's Customer-Focus OCB,
- Department's Customer Satisfaction

Other qualitative factors for ERP success as identified by Chen et al. (2002) include;

- Implementation success,
- Organizational fit of ERP,
- ERP adaptation,
- Process adaptation,
- Organizational resistance

Leon (2008) identifies a descriptive roadmap to successful implementation of ERP including several activities as follows

- Pre-implementation planning
- Package selection
- Quality, knowledge and experience of the consultant(s)
- Caliber of the project manager
- Implementation team composition
- Top management support
- Funds and other resources allocation
- Training and education
- Knowledge transfer from consultant to employees
- Use of the system

The success of ERP will therefore require more than just employment and application of the same as put forward by Leon (2008) that a successfully implemented ERP will need proper use to reap benefits from. The proper use of the system is in the hands of the end user and their cooperation, knowledge, aptitude and attitude are crucial for the success of the ERP system

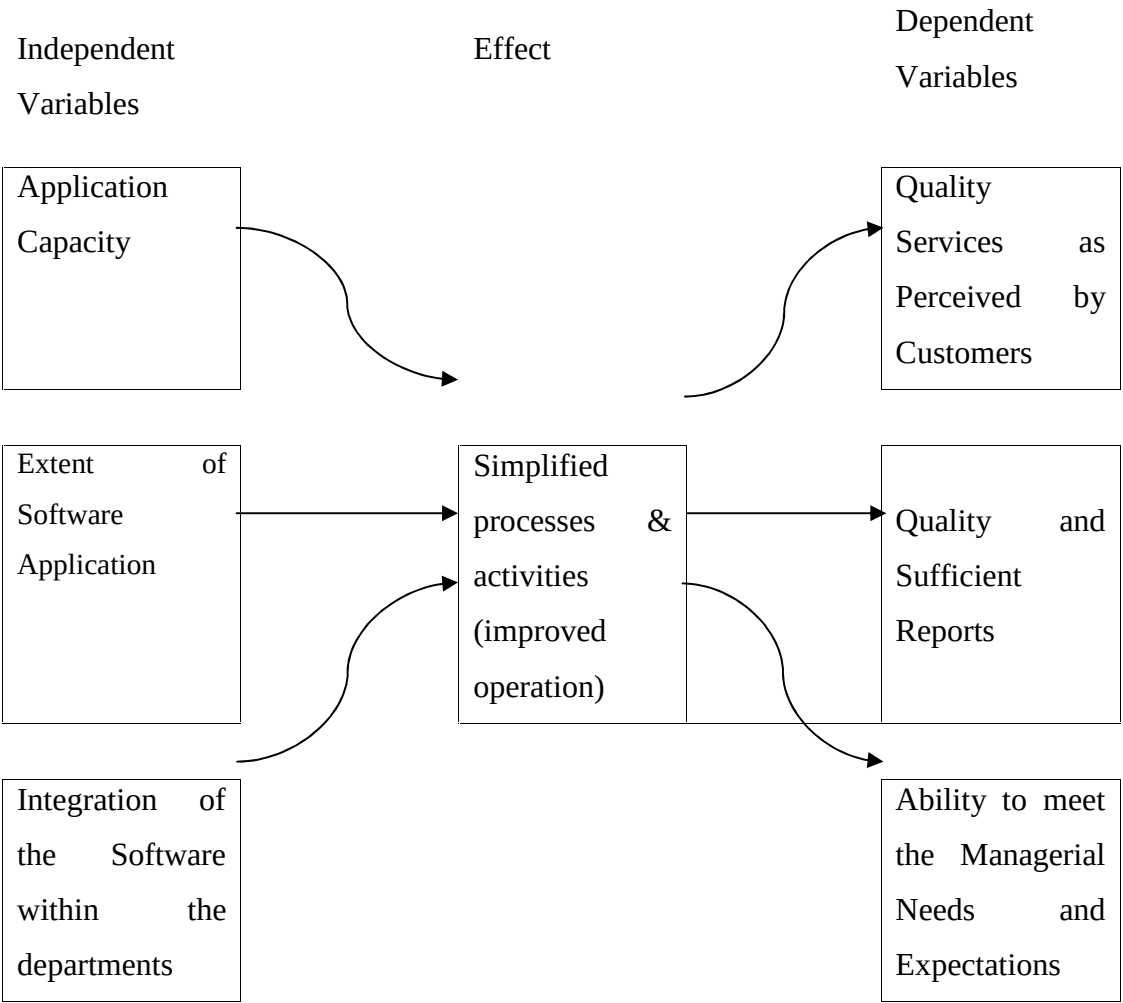
As a result of successful ERP implementation organizations are expected to achieve much in operation efficiency and improvement of service quality (Khaled et al. 2010).

2.4. Conceptual Framework

Figure 2.1 below provides the conceptual framework whereby the independent variables include application capability, extent of application of the software and the extent to which the software is integrated within the departments of the authority. Dependent variables include quality services as perceived by customers, quality and sufficient reports and ability to meet managerial needs and expectations.

Specifically application capacity is considered to have influence on attainment of efficiency and quality objectives of the authority. Similarly the extent of software application is expected to have a positive influence on attainment of efficiency and quality objectives of the authority which include quality customer services, quality reports and ability to meet managerial expectations. Lastly the level of software integration is expected to have a positive influence on attainment of efficiency and quality objectives of the authorities.

Figure 2.1: Conceptual Framework



Source: The Researcher

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This research study aims at understanding the relationship and influence of effective organizational implementation of the ERP to the efficient operation and the improvement of service quality in water sector in Tanzania. The chapter include research design, population of the study, sample and sampling techniques, data collection techniques and data analysis techniques.

3.2 Research Design

This study is a qualitative research and therefore methodologies used to undertake a qualitative research was applied during the study.

A case study of one Authority among many in Tanzania was used and the researcher carried out the study in Tanga UWASA in Tanga City with all the data collected, tested and analyzed at field where relevant Tanga UWASA officials who could support with information giving and analysis and interpretation of various type of information could be readily contacted. After the data collection, analysis and interpretation the researcher leaved the physical site to provide him with enough space independent of Tanga UWASA environment for the purpose of making data interpretation and resort to conclusions and recommendations.

3.3 Area of the Study

The study was conducted at Tanga city where data were collected from chosen people Tanga UWASA

3.4 Population of the Study

The population in use for this study consisted members of management team and those who are at supervisory level in Water Supply and Sewerage Authorities of Tanzania where the commercial water supply and sanitation services are provided to the customers (respective areas residents).

3.5 Sample Size and Sampling Techniques

The sample size in this study is 30 respondents. The respondents were selected purposefully and based on convenience, and thus non probability sampling techniques were used based on the nature of the population of the study, and for the managerial and supervisory staffs it was expected that the biasness will be minimal.

3.6 Data Collection Techniques

The data collection techniques that were employed by the researcher are

- Administered Questionnaires to the management, staff, customers and stakeholders of Tanga UWASA,
- Interviews and discussions with some employees and members of the management over several crucial issues,
- Observation of some activities as they are being performed by the employees,
- Review of documents and reports relating to procedures, activities, decisions and events relevant to the service provision by the Authority,
- Referencing from text books and journals over the concept and its implications to this type of research.

3.7 Data Analysis

Data collected was analyzed after they are coded, edited and tabulated in order to be in a format that can allow testing and analysis through the use of SPSS (Statistical Package for the Social Sciences) which can ease the task of data analysis and reduce the probability of errors and mistakes leading to wrong interpretation and conclusion.

CHAPTER FOUR

FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter presents the results of the research analysis from the interviews, distributed questionnaires, reviews of various company documents and observation and analysis and discussion of the results by using interpretation of fact and figures in order to draw valid conclusion.

The first section describes the profiles of the respondents. The second section analyses the capacity of the authority in implementing the ERP software. The third section analyses the extent of application. The fourth section analyses the effectiveness of the ERP in attainment of efficiency and quality objectives of Tanga UWASA.

4.2 Profile of the Respondents

This section of the chapter sets out the descriptive statistics. As noted in the previous chapter, the research sample comprised of 30 research participants.

4.2.1 Gender

Although ideally the research should have attracted a 50/50 split of males and females in order to ensure lack of bias, this was not possible due to the fact that the study case, which is Tanga Urban Water Supply and Sewerage Authority, has uneven gender distribution of employees. Accordingly the gender distribution was calculated as being 80% male and 20% female in order to ensure that 30 questionnaires were gathered. This equates to 24 males and 6 females.

4.2.2 Age

This study targeted elder generation as it is generally apparent that managerial level and supervisory level in many institutes have greater appeal to this generation. This study specifically sought to target the elder generation in order to know the

effectiveness of ERP application in the provision of efficient and quality public services in Tanzania.

4.3 Capacity of the Authority to Apply ERP

Several specific questions were raised in order to derive answers that would lead to the achievement of the respective specific objectives of the research. One among those questions was stated as follows: Does the authority have the capacity to apply ERP? The findings to this question were presented and analyzed in relation to availability of activities which require the use of the software, training on how to use the software, staff capability and user involvement in software development.

4.3.1 Availability of the Activities which require the use of ERP software

When the respondents were asked on availability of the activities which require the use of ERP software 94.1% responded ‘yes’ while the remaining responded ‘no’ and ‘not that I know of’. Thus in terms of available activities it seems the organization has the capacity to apply the software. Table 4.1 below presents the data findings on availability of the activities which require the use of computerized ERP.

Table 4.1: Activities in place of work (Department/ Section/ Unit) require the use of Computerized Enterprises Resources Planning

	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	27	94.1	94.1	94.1
No	1	2.0	2.0	96.1
Not that I know of	2	3.9	3.9	100.0
Total	30	100.0	100.0	

Source: Field Data 2014

Discussion

The results as reflected in Table 4.1 indicate that the coherence analysis of the activities in place of work (Department/ Section/ Unit) require the use of Computerized Enterprises Resources Planning. This is due to the fact that a marked difference between respondents who use ERP and those who else do not use it in comparing the mean of total valid percentage on the component scores shows that the information flow between the Authority and all business functions within the boundaries of the institution and management of the Authority's connections with its outside stakeholders is done by using the Enterprise Resource Planning software.

4.3.2 Training on how to use ERP software

One of the aspects considered in assessing the capacity of the authority in implementing the ERP software is level of staff training. Table 4.2 below presents the responses on the level of employee training.

Table 4.2: Training on how to use ERP software

	Frequency	Percent	Valid Percent	Cumulative Percent
Yes, appropriate and professional training outside the workplace	3	10	10	10
Yes, but local within the job by peers/ workmate/ supervisors	19	64	64	74
No, many/ some just have trained themselves by navigating through	7	23	23	97
Many/ some are not even familiar with the use of the system	1	3	3	100.0
Total	30	100.0	100.0	

From the table above most of the staff, about 64% said that they have undergone training in relation to using the specific software they are currently using locally and not professional training. Based on the results most of the respondents admitted that they are less familiar with the software.

It is also clear that the Authority staffs see the need of using the Enterprise Resource Planning software to integrate departments and functions of an Authority into a single computer system to give out a range of needs of their departments that's why a great number of correspondents has not gone for professional training but still use the software after they train themselves by navigating through so that they can easily

All in all it may be interpreted that the authority has less capacity to apply the software when we consider staff capability.

4.3.3 Staff Capability

In assessing the capacity of the Authority to apply the software the researcher considered also the capability of the staff in the work place. The respondents were asked to give their views on whether they have enough capability to implement the ERP software. The responses are presented in table 4.3 below.

Table 4.3: Staff Capability

	Frequency	Percent	Valid Percent	Cumulative Percent
No Capability	3	10	10	10
Low Capability	4	13.5	13.5	23.5
Moderate Capability	9	30	30	53.5
High capability	10	33	33	86.5
No Response	4	13.5	13.5	100
Total	30	100.0	100.0	

From the table above 33% of the respondents said that they have high capability to implement the software, 30% responded that they have moderate capability, 13.5% responded that they have low capability and 10% responded that they have no capability. When we consider the median of the average percentage which falls under the “moderate capability response” the results suggest that the authority has moderate capacity to implement the ERP software.

The respondents who gave no capability, low capability and moderate capability responses mentioned poor user involvement in software development to be the main reason for lack, low or moderate capability to implement the software. According to them, ERP software is complex and it has many significant implications for staff work practice. Implementing the software was found to be a difficult task that the Authority 'in-house' IT specialists alone could not handle it. Hence to implement ERP software, the Authority hired third party consulting companies who worked closely with in house staffs.

When all respondents were asked on the level of user involvement in the development of the software they gave different responses as presented in table 4.4 below.

Table 4.4: Involvement of Relevant Members in the Development of the Software

	Frequency	Percent	Valid Percent	Cumulative Percent
Not, Involved	6	20	20	20
Yes, but less involved	9	30	30	50
Yes, moderately involved	8	26	26	76
Yes, highly involved	5	17	17	93
No Response	2	7	7	100
Total	30	100.0	100.0	

The data presented in table 4.4 above reveals that although IT department takes an initiative to involve the Authority departments, still the level of involvement is not high. When we consider median percentage the results suggest less involvement with a cumulative percentage of 50.

Generally the respondents said that their involvements were in giving their requirements and specifications, aiding in designing and program development and actively involved in the customization process stage by stage.

4.4 The Extent of ERP Application at Tanga UWASA

4.4.1 The Application Extent in Four Departments

This study measured the application extent of a four main components of the Enterprise Resource Planning Systems (ERP) in the Tanga UWASA which are Sales & Marketing, Management & Production, Accounting & Finance, and Human Resources, and the application extent was measured by three categories of responses: low, medium and high. The results indicated that there is a medium application extent for the four components of Sales & Marketing, Management & Production, Accounting & Finance, and Human Resources, and the level of application for these four components are as shown in table 4.5 below whereby the medium category has the average response of 67.5%. Accordingly these results suggest the extent of ERP application in the four main departments to be moderate.

Table 4.5: Extent of ERP Application in Four Departments

		Extent of Application of ERP			
		High	Medium	Low	
Sales& Marketing	Frequency	2	21	7	30
	%	6.7	70	23.3	100
Management& Production	Frequency	5	22	3	30
	%	16.7	73.3	10	100
Accounting& Finance	Frequency	2	18	10	30
	%	6.7	60	33.3	100
Human Resources	Frequency	4	20	6	30
	%	13.3	66.7	20	100
AVERAGE	Frequency	3.25	20.25	6.5	30
	%	10.8	67.5	21.7	100

4.4.2 The Use of Computerized ERP in Various Activities in Tanga UWASA

Apart from assessing the extent of ERP application in the four main departments the researcher also assessed the extent of application of ERP in various activities performed by Tanga UWASA. Table 4.6 below presents the data on the same.

Table 4.6: The Use of Computerized ERP (software) in Various Activities in Tanga UWASA

We use computerized ERP (software) in various activities in our place of work				
	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	24	80	80	80
No	6	20	20	100.0
Total	30	100.0	100.0	

From the data reported in Table 4.6 the Authority use ERP in management of its business as the respondents percentage score shows that great percentage of interviewees (80%) that belongs to management level use this single software to manage Authority problems such as material shortages, customer service, finances management, quality issues and inventory problems. In nutshell the result shows that Tanga UWASA managerial level use ERP system as a dashboard.

4.4.3 The Use of Other Software

The researcher was also interested to know the extent application of other software with the aim of ultimately making a comparison between the extent of ERP application and applications of other systems. Table 4.7 below presents data on the extent of application of other software.

Table 4.7: The Use of Other Software

	Frequency	Percent	Valid Percent	Cumulative Percent
	1	4	4	4
One	8	26.5	26.5	30.5
Two	13	43	43	73.5
More than three	8	26.5	26.5	100.0
Total	30	100.0	100.0	

Table 4.7 shows that the Authority is impacted by information technology as out of 30 correspondents who were interviewed admitted to use one software, two or three software to achieve his/her strategic goals that will lead the Authority to attain its goals of been the leading Authority in Africa in water sector. The median application percentagewise is two software applications. When asked on specific software used the respondents responded “We have and use JP First, Tally 6.3, Perfect bill and AutoCAD software at our work place (Department/ Section/ Unit)”.

4.5 The Effectiveness of ERP in improving Efficiency and Quality Objectives at Tanga UWASA

ERP can provide significant improvements in efficiency across a company, but only when implemented correctly. Otherwise, an ERP system could be a curse and drag the whole enterprise into spiraling inefficiency. Planning for ERP systems and their implementations requires an integrated approach to meet the requirements of various functional areas. With a brief overview of ERP implementations, this paper describes some experiences of an ERP implementation in Tanga UWASA. The case study reveals some of the ins and outs during the planning and implementation stages that may occur in any company.

The Effectiveness of ERP in improving Efficiency and Quality Objectives at Tanga UWASA was assessed based on the following four aspects:

1. Attainment of efficiency due to integration of the software within different departments of UWASA

2. Knowledge and level of service quality as assessed by customers
3. Effectiveness of ERP software in Providing Quality and Sufficient Reports
4. Effectiveness of ERP software in meeting management needs at workplace

4.5.1 Attainment of Efficiency due to Integration of the Software within Different Departments of UWASA

The researcher assessed how ERP software was integrated within different departments of the organization as an aspect related to attainment of effectiveness, efficiency and quality objectives of Tanga UWASA. The respondents were required to respond on whether the ERP software is well integrated within different departments of the authority whereby they were asked to give a yes or no response. Table 4.8 below presents the findings.

Table 4.8: Integration of the Software

	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	20	67	67	57
No	10	33	33	100.0
Total	30	100.0	100.0	

Table 4.8 shows that the Authority tries to integrate ERP with its different departments and functions into a single computer system according to the needs of the particular department. This means that the Authority has different departments which have an individual software program that is optimized in the way each department works. As shown in the table above a great number of correspondents (67%) agreed to use software which integrates with one another. With this integrated solution, different departments of the Authority share information and communicate with one another easily.

As the software is well integrated it contributes towards attainment of effectiveness efficiency and quality objectives of the Authority.

4.5.2 Knowledge and Level of Service Quality As Assessed By Customers

The respondents were asked on whether customers have knowledge of the existence of ERP software and that it is aimed at provision of efficient, effectiveness and high quality service delivery. Table 4.9 below presents the data on the same.

Table 4.9 Knowledge of Customers on Existence of the Software

Our customers know of the existence of the software in our workplace and that we use it to serve them				
	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	25	83.3	83.3	83.3
No	5	16.7	16.7	100.0
Total	30	100.0	100.0	

From the table above most of the respondents (83.3%) responded that customers have knowledge on the existence of the software and that it was aimed at providing better services. Based on the results most of customers are well informed of the existence of the ERP and the respondents admitted that the customers are satisfied with fast and efficient services provided.

On effectiveness of ERP in improvement of service quality the respondents were required to give their responses based on the given options. Table 4.10 below presents their responses.

Table 4.10: Effectiveness of ERP in Improvement of Service Quality

	Frequency	Percent	Valid Percent	Cumulative Percent
No Service Improvement	5	17	17	17
Low Service Improvement	6	20	20	37
Moderate Service Improvement	8	26	26	63
High Service Improvement	9	30	30	97
No Response	2	7	7	100
Total	30	100.0	100.0	

From the table above the median percentage is within the moderate service improvement range with cumulative frequency of 63. Therefore the ERP software has contributed moderately in attainment of efficiency and quality objectives of the authority.

4.5.3 Effectiveness of ERP Software in Meeting Management Needs at Workplace

The respondents in the study sample were asked to give their perception on effectiveness of ERP software in meeting management needs at work place. The respondents were required to respond to a set of alternative options provided. Their responses are as summarized in table 4.11 below.

Table 4.11: Effectiveness of ERP Software in Meeting Management Needs at Work Place

	Frequency	Percent	Valid Percent	Cumulative Percent
No, there's a need for replacement	2	7	7	7
It would be effective after appropriate upgrades, renovation and customization	6	20	20	27
Yes, but fairly low	6	20	20	47
Yes, fairly effective	16	53	53	100
Total	30	100.0	100.0	

In the table above the median percentage falls under “Yes, fairly effective response”. These results suggest that ERP software is effective in meeting management needs at work place.

4.5.4 Effectiveness of ERP software in Providing Quality and Sufficient Reports

Table 4.12 presents data for the responses on how the ERP software assists easy provision of different reports within the organization.

Table 4.12: The Easiness in Getting Different Types of Reports

	Frequency	Percent	Valid Percent	Cumulative Percent
No	12	40	40	40
Yes	13	43	43	83
No Response	5	17	17	100
Total	30	100.0	100.0	

The median percentage in the responses above falls under ‘yes’ response with the percentage of 43 and 83 cumulative percentage. However those who responded ‘No’ who account for 40% cannot be ignored. Therefore it can be said that to some extent the ERP software has facilitated the easiness in getting different types of reports.

The researcher also assessed the effectiveness of the ERP software in providing sufficient and quality reports for attainment of quality objectives of UWASA. Table 4.13 summarizes the responses from the respondents.

Table 4.13: Sufficiency and Quality of the Reports Prepared

	Frequency	Percent	Valid Percent	Cumulative Percent
Not helpful at all	3	10	10	10
Major customization needs to be done	2	7	7	17
Sufficient but needs improvement	11	36	36	53
Sufficient and serve the purpose	14	47	47	100
Total	30	100.0	100.0	

From the table above the median response percentagewise fall under those who said that the reports prepared are sufficient but needs improvement. When we consider mode in the frequency distribution we find that it falls under those who said that the reports are sufficient and serve the purpose. The general implication is that the ERP software is effective in ensuring the sufficiency and quality of the reports prepared.

4.6 Problems affecting the Effectiveness of the ERP software in attainment of Efficiency and Quality Objectives

In assessing the problems affecting the effectiveness of the ERP software in attainment of efficiency and quality objectives the respondents were required to either give a yes response or a no response on whether they experience different types of application problems in the software they are using. Table 4.14 below provides the summary of the responses.

Table 4.14: Existence of User Application Problems

	Frequency	Percent	Valid Percent	Cumulative Percent
No	2	7	7	7
Yes	27	90	90	97
No Response	1	3	3	100
Total	30	100.0	100.0	

From the table above it is revealed that about 90% of the respondents are experiencing application problems with the ERP software.

When they were asked to mention specific problems they are experiencing they said that problems that they experience are technical in nature and these are mostly caused by poor systems design, hardware problems and ineffective technical support they receive from the internally placed experts. Table 4.15 below presents the summary of the responses on different types of problems mentioned.

Table 4.15: Technical Problems Experienced

	Frequency	Percent	Valid Percent	Cumulative Percent
System design	8	27	27	27
Hardware problems (i.e computer in use)	7	23	23	50
Ineffective technical support	7	23	23	73
Technical obsolescence of the software itself	3	10	10	83
User knowledge	1	3	3	86
No Response	4	14	14	100
Total	30	100.0	100.0	

Apart from the problems mentioned in table 4.15 other problems mentioned include difficulty in analyzing costs and profits on a product or consumer basis, to be flexible to face ever altering business requirements and to be informed of management decision making processes and changes in ways of doing business.

When the respondents were asked on the reasons for the identified problems they said that the problems faced in the current software are due to old age of the respective systems (30%), poor system development (26.5%), less consideration of user needs during development (16.5) and poor technical support around the operation (7%). About 20% of the respondents did not mention any specific reason but they just said that there is a need for replacement. The mentioned reasons are presented in table 4.16 below.

Table 4.16: The Reasons for Identified Problems

	Frequency	Percent	Valid Percent	Cumulative Percent
Old age of the respective systems	9	30	30	30
Poor system development	8	26.5	26.5	56.5
Less consideration of user needs during development	5	16.5	16.5	73
Poor technical support around the operation	2	7	7	80
No, there's a need for replacement	6	20	20	100.0
Total	30	100.0	100.0	

4.7 Solutions to Identified Problems

Table 4.17 below shows in its extremity, the solutions to the problems experienced with regard to the operationalization of the software in use. Most of the respondents (43.3%) considered purchase and installation of new software to be the solution to the identified problems. Other suggestions include customization of the new software by our own experts (20%), repair and/ or rehabilitation of the existing software (16.7%) and customization of the new software by experts from outside (16.7%).

Table 4.17: Solutions to the Problems

	Frequency	Percent	Valid Percent	Cumulative Percent
Purchase and installation of new software	13	43.3	43.3	43.3
Customization of the new software by our own experts	6	20	20	63.3
Repair and/ or rehabilitation of the existing software	5	16.7	16.7	80
Customization of the new software by experts from outside	5	16.7	16.7	96.7
No Response	1	3.3	3.3	100.0
Total	30	100.0	100.0	

CHAPTER FIVE

SUMMARY CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter provides the summary, conclusions and recommendations on the effectiveness of Enterprise Resource Planning (ERP) software on attainment of efficiency and quality objectives of Tanga UWASA.

5.2 Summary

The study aimed at assessing the effectiveness of Enterprise Resource Planning (ERP) application in the provision of efficient and quality public services in Tanzania whereby Tanga UWASA was used as a case study.

The specific objectives of the study were as follows:

- a.) To assess the ERP application capacity at Tanga UWASA
- b.) To determine the extent of ERP application at Tanga UWASA;
- c.) To determine the effectiveness of ERP in improving efficiency and quality objectives at Tanga UWASA.
- d.) To identify the problems affecting the effectiveness of the ERP software in attainment of efficiency and quality objectives of UWASA

Both theoretical and empirical literatures were reviewed and at the end of the chapter the researcher provided the conceptual framework which depicted the relationship between independent and dependent variables.

Data were collected mainly from a sample of 30 respondents through questionnaire and interview methods. The collected data was analyzed by using both quantitative and qualitative data analysis techniques.

The data analysis chapter was organized in five sections based on the research objectives.

The first section provided the profile of respondents whereby gender and age of the respondents were considered.

The second section assessed and analyzed the capacity of the authority in implementation of ERP software whereby it was observed that there is a moderate application capacity. The application variables were availability of activities which require the application of the software, level of staff training, perceived staff capability and level of staff involvement in the software development.

The third section assessed and analyzed the extent of ERP application within the four departments of the Authority. The section presented and analyzed data also on the extent of application of the software in different activities.

The fourth section presented and analyzed data in relation to the third research objective which aimed at determining the effectiveness of ERP in improving efficiency and quality objectives at Tanga UWASA. The study assessed effectiveness in attainment of efficiency due to integration of the software within different departments of UWASA, knowledge and level of service quality as assessed by customers, effectiveness of ERP software in providing quality and sufficient reports and effectiveness of ERP software in meeting management needs at workplace.

The fifth section presented data the problems which affect the effectiveness of the software in attainment of efficiency and quality objectives of the authority. Most of the problems identified are technical in nature. When the respondents were asked on the reasons for the identified problems they said that the problems faced in the current software are due to old age of the respective systems, poor system development, less consideration of user needs during development and poor technical support around the operation.

5.3 Conclusions

Based on the findings generally it may be concluded that Enterprise Resource Planning Software application is moderately effective in the provision of efficient and quality public services in Tanzania. The conclusions for each research objectives are as follows:

- a.) Tanga UWASA has a moderate capacity in ERP application.
- b.) The extent of ERP application at Tanga UWASA is also moderate
- c.) The ERP software is somehow effective in improving efficiency and quality objectives at Tanga UWASA. However its effectiveness is affected by a number of technical problems such as poor system development and low user involvement.

5.4 Recommendations

Ailing from the fact that most operational software in Tanzanian are from outside the country, it seems that they are mostly off-the-shelf packages and these are not suitable to the needs of the users by 100%. Even if these software were highly relevant, it seems, the needs by the users would be met by the internal customization of the software that reflect on the actual needs of the users as far as information management is concerned.

The question of internal development though seems to depend on the internal capability and the fact that an understanding of the actual problems and actual needs can be easily brought to light.

The managements of the respective organizations need to own these endeavors, as a matter of fact, aid or facilitate in initiating the projects that will see the software being developed and continuously monitor the activity.

With regards to the fact that most of these software will be used by the users with little knowledge of computer applications, there is a need to train the users diversely depending on their user categories.

Organizations need to see the requirements of users and consider the costs involved in acquiring or developing the respective software vis-à-vis the expected benefit that will be realized from the respective software use.

Migration from one software to another is also a factor for consideration and this will need to be taken into consideration during decision making to adopt the use of a different system that is currently used.

5.5 Areas for Further Research

The research prompts for other areas where research of the same kind may be of interest which include;

- Assessment and analysis of effective use of MIS in determining the effectiveness of Internal Controls in public sector.
- Efficient application of ERPs in public sector management of organizations.

REFERENCES

- Gaber, M & El-Tawel, A. (2011) Management Information; Informs. Available at:
www.scribd.com/.../Management-Inform
- Enterprise Architect (2004) The business process model; UML TUTORIALS. Available
at: <http://www.sparxsystems.com/downloads/whitepapers>
- Christopher Koch and Thomas Wailgum (2008) Changes in ERP Technology; ERP
(Enterprise Resource Planning) topics. Available at:
<http://www.cio.com/article/40323/ERP>
- Erik Brynjolfsson, (1994). Information Assets, Technology, and Organization;
Management Science Vol . 40, No. 12 (Dec., 1994), pp. 1645-1662.
- Laudon, K. & Laudon, J, (2010).Management Information System – Managing the
Digital Firm; (pp.32-115). New Jersey: Pearson Prentice Hall
- Feeny, David E., & Blake, Ives. (1990).In search of sustainability: Reaping the long-
term advantage from investments in Information Technology. Journal of
Management Information Systems.
- Gaber, M. (1990) Management Information Systems (pp. 21-28). Chicago, Illinois:
Prentice Hall
- META Group. (2004) The State of ERP Services (Executive Summary)Market
Research: META Group, Inc., Stamford, CT.
- Davenport T. H. (1998).Putting the Enterprise into the Enterprise System. Harvard
Business Review, (July-August): 121-33.

- Liang H. (2007) Assimilation of Enterprise Systems: The Effect of Institutional Pressures and the Mediating Role of Top Management. MIS Quarterly, 31(1): 59-87.
- Bhattacharya P. J, Seddon P. B and Scheepers R. (2010).Enabling Strategic Transformations with Enterprise Systems: Beyond Operational Efficiency. ICIS 2010 Proceedings. Paper 55.
- Scheer A. W and Habermann F. (2000). Making ERP a Success. Communications of the ACM, 43(4): 57-61.
- DING Bin, XU Xin, Eric W. T. Ngai, and Vincent W. S. Cho (2011), An Investigation of the Role of the IT Department in Achieving ERP Success
- Nelson R. R and Cheney P. H. (1987). Training End-Users: An Exploratory Study. MIS Quarterly, 11(4): 547-559.
- Yi M. Y and Davis F. D. (2003). Developing and Validating an Observational Learning Model of Computer Software Training and Skill Acquisition. Information Systems Research,14(2): 146-169.
- Sharma R and Yetton P. (2007).The Contingent Effects of Training, Technical Complexity, and Task Interdependence on Successful Information Systems Implementation. MIS Quarterly, 31(2): 219-238.
- Simon A. R. (1990). How to Be a Successful Computer Consultant, 2nd Ed., McGraw-Hill, New York.

- Soh C. P. P, Yap C. S and Raman K. S. (1992). Impact of Consultants on Computerization Success in Small Businesses. *Information and Management*, 22(5): 309-319.
- Sabherwal R, Jeyaraj A and Chowa C. (2006). Information System Success: Individual and Organizational Determinants. Management Science, 52(12): 1849-1864.
- DeLone W. H. (1998).Determinants of Success for Computer Usage in Small Business. MIS Quarterly, 12(1): 51-61
- Leon,Alexs(2008). Introduction to ERP. Available at:
[www.leon- leon.com/it/erpdse/downloads/sg02.pdf](http://www.leon-leon.com/it/erpdse/downloads/sg02.pdf)
- Huei-Huang CHEN, Shih-Chih CHEN, Li-Hung TSAI (2002) A Study of Successful ERP – From the Organization Fit Perspective 4F, No.49 Available at:
[www.iiisci.org/journal/CV\\$/sci/pdfs/ZS807UT.pdf](http://www.iiisci.org/journal/CV$/sci/pdfs/ZS807UT.pdf)
- Khaled A, Tillal E and Aisha N. (2010). Challenges and Influential Factors in ERP Adoption and Implementation. European, Mediterranean and Middle Eastern Conference on Information Systems, Abu Dhabi, UAE

APPENDIX

APPENDIX I:

INTERVIEW GUIDE TO UWASA STAFFS

Name:

Designation:

Department:

Section/ Unit:

System User Category:

Questionnaire No:

Respondent Category:

Date:

Key:

- Categories of Users:
 - A – System Administrator(s)
 - B – Users who can write, add, edit, delete, import, export, read and print data.
 - C – Users who can just read and print data.
 - D – Users who can just view the data
- Respondent Category:
 - 1 – Respondents from the management level
 - 2 – Respondents from supervisory and operational (floor) level

Note of ethical consideration:

- The information which will be provided in this questionnaire will be confidential and will only be used for the study purpose in pursuit information gathering that can help the Authority explore ways to solve some or all Information System related problems.
- The respondent is at liberty not to disclose any of his/ her personal information and details on the circumstances of privacy and confidentiality if in need of.

- ❖ A separate sheet, then attached may be used to give additional details relevant to any part.

SECTION A: ERP PROFILE AT WORK PLACE

(Please tick the appropriate)

1. Activities in my place of work (Department/ Section/ Unit) require the use of Computerized Enterprises Resources Planning

- Yes. []
- No []
- Not that I know of []

2. We use computerized ERP (software) in various activities in our place of work.

Yes []

No []

3. We have and use software at our work place (Department/ Section/ Unit);

- One []
- Two []
- Three []
- More than three []

4. Staff in our workplace are familiar/ have undergone user training in relation to the software that we are using;

- Yes, appropriate and professional training outside the workplace []
- Yes, but local within the job by peers/workmate/supervisors []
- No, many/some just have trained themselves by navigating through []
- Many/ some are not even familiar with the use of the system []

5. The software in use within our workplace integrate with each other automatically and with others used in other places of work

Yes [] No []

If NO, why?

- i. **Incompatibility between them, developed by various vendors and uses different technologies and operate on different platforms**
- ii.
- iii.
- iv.
- v.

6. Our customers know of the existence of the software in our workplace and that we use it to serve them;

Yes [] No []

7. The software that is in use in our workplace was;

(Multiple choices are possible)

- Acquired off-the-shelf/ from a commercial vender []
- Developed by an external software developer/ contractor []
- Developed internally by our own IT personnel []
- Granted to us directly from the Government/ Donor []

8. In developing the software that is in use in our workplace, relevant members of staff from our office were consulted and they contributed;

Yes [] No []

If YES, in what capacity;

(Multiple choices are possible)

- As users to give their requirements and specifications []
- As users to participate in the design of the software []
- As technical personnel to aid in the design and program development []
- Were actively involved in the customization process stage by stage[]
- As counterpart technical experts to the development of the system[]

9. We think the solution to the problems and weaknesses present in our software can be corrected by;

- Purchase and installation of new software []
- Repair and/ or rehabilitation of the existing software []
- Customization of the new software by experts from outside []
- Customization of the new software by our own experts []
- Cannot be solved entirely []

SECTION B: STATUS OF USEFULNESS AND SUPPORT OF THE ERP APPLIED

(Please tick the appropriate)

10. We use application package(s)/ software in our line of work and the ones we use are-;

- i.
- ii.
- iii.
- iv.
- v.

11. We use the application package(s)/ software mentioned above for the following activities-;

- i.
- ii.
- iii.
- iv.
- v.

12. We perceive that the weaknesses in the current software are due to;

- Old age of the respective systems []
- Poor system development []
- Less consideration of user need during development []
- Poor technical support around the operation []
- No, there's a need for replacement []

13. I/we received user training before being required to use the software that I/we are using;-

Yes [] No []

If YES, who provided the training?

(Multiple choices are possible)

- Software vender we purchased the system from []
- Training institution that I/ we had to attend []
- IT experts from within the Authority []
- Outside consultants []
- Other users (colleagues) []

14. The software we are using suit the information management needs at our workplace;

- Yes, highly effective []
- Yes, fairly enough []
- Yes, but fairly low []
- It would after appropriate upgrades, renovation and customization []
- No, there's a need for replacement []

15. We experience different types of user/ application problems in the software that we are using;

Yes [] No []

And they are mostly related to;

(Multiple choices are possible)

- System design []
- User knowledge []
- Hardware problems (*i.e.* computers in use) []
- Ineffective technical support []
- Technical obsolescence of the software itself []

16. We experience different types of technical problems in the software that we are using;

Yes [] No []

And they are mostly related to;

(Multiple choices are possible)

- System design []
- System development []
- Hardware problems (*i.e.* computers in use) []
- Ineffective technical support []
- Technical obsolescence of the software itself []

17. It is easy to get different types of reports from the software that I use;

Yes [] No []

18. The reports that are provided by the software I use are;

- Sufficient and serve the purpose []
- Sufficient but needs improvement []
- Major customization needs to be done []
- Not helpful at all []

19. The software that we use at my/our work place is/are user friendly, easy to work with and have features that match our requirements;

- No []
- Not really []
- You may say so []
- Yes, it is acceptable []
- Yes, highly appreciated []

SECTION C: USER RECOMMENDATIONS

(Please tick the appropriate)

20. If the Authority was to ask of my opinion on the system (software) that we are using, this would be my opinion;-