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Challenges and Benefits of ERP Implementation: The Case of Public Sectors in Ethiopia

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Abstract

ERP system is being adopted by international organizations globally, in order to streamline business processes, manage and create seamless integration, and ensure real time information availability for decision making. ERP adoption is considered as one of the biggest and most complex projects a firm could manage even though these projects can vary in size, structure, and methodology. Applying this kind of system into government sector requires more effort from different aspects such as change management, business process re-engineering, data migration user training and other related issues and since government sectors has restricted law and procedure that is not flexible and rarely changes, implementing an ERP system has a lot of consideration and faces a lot of challenges. The main purpose of this research therefore is, to identify the benefits and challenges of implementing ERP (Enterprise Resource planning) in public sectors, and to recommend possible solutions for the gap. Due to the nature of the research and to achieve the main purpose of the study, a mixed quantitative and qualitative approach is used with questionnaire and semi structured interview from a sample population as its primary research methodology. Accordingly, data were collected from three Ethiopian governmental organizations and analyzed. Results show that network problem and limited understanding of the benefits and cost of the implemented ERP system are the main challenges. On the other hand the main benefit generated from the system are providing more timely information, improving services for ERP clients and added value to the companies and the organizations that was using the ERP system for their business operations. Recommendations are forwarded based on the findings of the study.

Keywords: Benefits, challenges, ERP, government sector

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List of Acronyms and Abbreviations

ERP	Enterprise Resource Planning
IFMIS	Integrated Finance Management System
HRMS	Human Resource Management System
RMIS	Record Management Information System
TFMS	Transport Fleet Management System
PSMS	Purchasing and Supply Management System
PMS	Payroll Management System
SRMS	System Resource Management System
WWDSE	Water Works Design and Supervision Enterprise
MoFEC	Ministry of Finance and Economic Cooperation

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CHAPTER – ONE

INTRODUCTION

Background

Since the mid-1990's many public sector organizations have followed the private sector and implemented pre-packaged commercial Enterprise Resource Planning (ERP) solutions in favor of a proprietary systems development effort. Although ERP software may not exactly support all complex business processes, public sector organizations are willing to trade-off complex domain specific functionality for the benefits gained from a pre-packaged enterprise information system. By not developing a proprietary solution, the expectation is that there will be significant cost savings and increased organizational efficiency (Sommer, 2011).

According to Aladwani (2001) the enterprise resource planning (ERP) system is an integrated set of programs that provides support for core organizational activities such as manufacturing and logistics, finance and accounting, sales and marketing, and human resources. An ERP system helps the different parts of the organization share data and knowledge, reduce costs, and improve management of business processes.

Smeds (2010) also defined Enterprise resource planning (ERP) system as one of the most popular business management systems, providing benefits of real-time capabilities and seamless communication for business in large organizations. However, not all ERP implementations have been successful. Since ERP implementation affects entire organization's process, people, and culture, there are a number of challenges that companies encounter while implementing ERP systems.

As cited by Seo (2013) Enterprise Resource Planning (ERP) is a software solution that integrates business functions and data into a single system to be shared within a company. While ERP originated from manufacturing and production planning systems used in the manufacturing industry, ERP expanded its scope in the 1990's to other "back-office" functions such as human

resource, finance and production planning (Swartz & Orgill, 2001; Nieuwenhuyse, Boeck, Lambrecht, & Vandaele, 2011). Moreover, in recent years ERP has incorporated other business extensions such as supply chain management, project management and customer relationship management to become more competitive (Seo, 2013).

The implementation of an ERP system in an organization is a very complex project. The implementation of such systems is difficult and involves a high costs, as well as considerable time and resource. Organizations completing such a project must be aware of the necessary commitments. The most important thing is that the implementation of ERP projects is a major event in the life of an organization. An ERP system is expected to change a lot of business, processes, and activities within the organization and often initiated with much expectation about the benefits and the transformation that the project would bring to the organization (Ibrahim, 2010).

As technical knowledge is required, strategic, organizational and people-related factors are significant in the success of an ERP project. Strong top management commitment is a most important issue in successful ERP implementation, as it involves a lot of changes in the organization. Also effective communications, effective project management, training and implementation team are essential throughout an ERP project in order to bind the various activities together (Ibrahim, 2010).

As clearly explained above regarding the topic different authors by different country (specially developed countries) and sector context tried to assess the problem they observe and filled the gap (practical and academic). But in a country like Ethiopia implementing an ERP system is a recent phenomenon. Thanks to globalization many multinational companies start to invest in the third world country for their own advantage and the countries also start to benefit. When they came they don't only bring the business idea and finance only rather they bring their experience including internal processes.

Currently, for any company to be successful, being meticulously strategic on its different departments is highly imperative and one of the characteristics of being strategic is using the best of the different modules of the ERP system on its inside operation. Actually, there is no single globally agreed best tool which can incorporate on all organizations – it's about how the tools are being implemented by their users.

Ethio-telecom, MoFEC and WWDSE has an ambition of being a world class companies and in order to be a world class companies, they decided to use a more sophisticated ERP tool so that their employee's activities are shifted from routine tasks to strategic ones. This tool has an advantage of automating the current manual processes.

The motive of this research was to fill the above mentioned gap for both academicians and practitioners. So the researcher's interest and motive was to identify the benefits and challenges of implementing the ERP system, to show the potential benefits and challenges and finally to recommend possible solution (s).

The researcher believes the findings of this research will contribute to the profession by adding new insights.

1.2 Organizational Background

1.2.1 Ethio-Telecom

The introduction of telecommunications services in Ethiopia dates back to 1894.Because of different reasons its name changed many times. Some of them are Imperial Board of Telecommunications of Ethiopian (IBTE), Ethiopian Telecommunication Services (ETS), Ethiopian Telecommunications authority (ETA), and Ethiopian Telecommunications Corporation (ETC).Then on November 29,2010 ethio-telecom was established as a public enterprise. The vision of the company is to be a world-class provider of telecom services and its missions are to connect Ethiopia through state of the art telecom services, Provide high quality, innovative and affordable telecom products and services that enhance the development of our nation, build reputable brand known for its customers' consideration, build its managerial

capability and manpower talent that enables ethio-telecom to operate at international level and support community and environmental development. Thus, ethio-telcom is born from this ambition in order to bring about a paradigm shift in the development of the telecom sector to support the steady growth of our country. Following introduction of the new company, a full-fledged IT solution named ERP was introduced having an objective of creating an automated work environment.

In the first phase, ethio telecom has decided to strengthen and streamline its financial, supply chain and human resource & payroll systems and processes. As part of this initiative, the organization implemented oracle eBS 12.1 for the Financial, HR & Payroll and Supply Chain functional streams and launched in February 2011.

Ethio telecom has implemented oracle eBS application to automate the core business processes from Sourcing, Human Resources and finance in the first phase, And now an Extension of the first phase was started to address other business requirements as well as the modules which were not covered in the first phase implementation.

1.2.2 WWDSE (Water Works Design & Supervision Enterprise)

WWDSE was established by government proclamation in 1998 to enhance the effort being made in realizing the potential use of the water resources of the country to improve the socioeconomic development of the society. During the last decade the enterprise was adhering government priorities and programs and had been providing significant contribution to address the national challenges in the water sector.

In this regard, the enterprise had delivered quality consultancy service to enormous government and private water resources projects with a strong dedication in line with the international standards and norms. Moreover, it had been playing a considerable roll in the sector in building national capacity in terms of human and material resources to form a strong consultancy service basis that would insure a steady exploitation of the abundant water resources potential of the country so as to assure a sustainable growth of the economy.

Currently, the Enterprise is the leading and the largest consulting firm in the water sector consultancy business in the country. It gives quality consultancy services to maximize customer's satisfaction.

In September 2013, WWDSE has implemented Cyber ERP system. The system has eight main modules that are the IFMS, HRMS, RMIS, TFMS, PSMS, PMS, CORE and SRMS. The ERP suite allows the company to implement a single integrated system by replacing incompatible legacy information systems and enhance decision making capabilities for executive managers.

1.2.3 MoFEC (Ministry of Finance and Economic Cooperation)

Ministry of finance was established during the region of Minilik II in October 1900 E.C. The name of the ministry at that time was called "YEGENZEBNA YEGUADA MINISTER" from 1900 up to 2000 ,16 ministers were leading the organization. The ministry of finance has the general duties and responsibilities of protecting the personal properties of the king and the government treasury managing the activities of the bank collecting any kinds of government revenue, effecting payments and preparing the financial statement of the government and report to the king and cabinet. The duties of the organization had been in use for many years without any change. But right after the end of the Italian occupation the ministry was newly organized in 1935 E.C and the name gave as "Ministry of Finance "in the meantime the ministry's former duties and responsibilities were modified so as make them in line with the economic trend of the country existing at that time. According the ministry was given the power to issue regulations and administrative orders to prepare the annual budget of the government; to collect tax, to establish and control banks, to print paper money, and to administer internal and external borrowing.

The Ministry of Finance and Economic Development (MoFED) now ministry of Finance and Economic Cooperation (MoFEC) is one of the executive bodies of the federal government, established on October 16,2001 as a merge of the previous two principal ministries; Ministry of Finance (MoF) and Ministry of Economic Development and Cooperation (MEDeC).

Over the past decade, developing, transition and post-conflict countries have increasingly embarked on efforts to computerize their government operations, particularly with respect to public financial management (PFM). Most common among these have been efforts to introduce

integrated financial management information systems (IFMIS) that computerize and automate key aspects of budget execution and accounting operations across the institutions of government. IFMIS can enable prompt and efficient access to reliable financial data and help strengthen government financial controls, improving the provision of government services, raising the budget process to higher levels of transparency and accountability, and expediting government operations.

An IFMIS stores, organizes and makes access to financial information easy. It stores not only all the financial information relating to current and past years' spending, but also stores the approved budgets for these years, details on inflows and outflows of funds, as well as complete inventories of financial assets (e.g. equipment, land and buildings) and liabilities.

The IFMIS was replacing the locally developed legacy integrated Budget Expenditure System (IBEX) with a commercial off the shelf (COTS) solution, Oracle E-Business Suite.

1.3 Statement of the problem

Enterprise Resource Planning (ERP) is a useful tool that builds strong capabilities, improves performance, supports better decision making, and provides competitive advantage for businesses. ERP aims to help the management by setting better business practices and equipping them with the right information to take timely decision (Ahmed, Zbib, & Arokiasamy et al. (2006).

Seo (2013) has also defined Enterprise resource planning (ERP) system as one of the most popular business management systems that provide benefits of real-time capabilities and seamless communication for business in large organizations, but he also added since ERP implementation affects entire organizations such as process, people, and culture, there are a number of challenges that companies may encounter in implementing ERP systems and that not all ERP implementations can be successful.

Soltanzadeh & Khoshsirat (2012) also agree that Implementing ERP causes massive change that needs to be carefully managed in order to acquire the benefits of ERP solutions.

Despite the significant benefits that ERP software packages provide in managing and integrating cross-functional business processes, there are several difficulties and barriers that relate to such an implementation. The major challenge is to integrate existing legacy systems and other applications with the ERP system to provide a common interface. Moreover, ERP systems are complex and implementing one of them can be challenging, time consuming and expensive project for every organization (davenport,1998).Addressing the difficulties of ERP implementation helps to plan better and facilitate a more successful ERP implementation (Ibrahim,2010).

ERP projects often experience high costs, and that about half of all ERP projects fail to achieve promised benefits. This result mainly occurs because the managers significantly underestimate the efforts involved in managing change (Ash & Burn, 2003).In addition many companies struggle during the implementation phase due to the underestimation of the complexity and the lack of experience for the change process. Because of that, When implementing it, top management commonly experience an unwanted attitude from potential users for one reason or another, they resist the implementation process (Hawking & Stein, 2004).

From the foregoing regarding the challenges of ERP, one can conclude that some are internal company problems and some are external problems. Among the internal problems, lack of skill of users, change resistances, lack of commitment of top management/implementers are among the major ones. On the other hand the module nature and standardization issue can be mentioned as external challenge.

Currently, there are limited researches of ERP system that are conducted in the context of Ethiopia. Other researchers focus only on a specific organization and fail to include different organizations behavior and the effect of different organizations behavior towards an ERP system.

Implementing ERP system is not about replicating other company's product rather it's about customizing and applying the tool in line with the nature (demographics and law) of the country, structure of the public organizations, policies and procedures, internal processes and other vital parameters. Therefore, it is very difficult to say the fiasco of implementation has existed because

Of the inefficiency of the tool, nature of the country, nature of the companies, policies and procedures or other things unless a detailed investigation is done Ferrario & Montagna (2004).

Shiri (2012) and other scholars discussed different benefits and challenges of companies as a result of implementing ERP. Some of the major observed problems are:-

1. After implementing the system, companies don't know the generated benefits and the faced challenges.
2. Some companies say they got the benefit but they can't quantify it clearly .I.e. if things can't be measured they can't be managed.
3. Some companies even don't know whether the benefit is transactional, traditional or transformational.
4. Some companies know the type of the benefit but they can't categorize them.
5. Some companies can't assess whether the ERP has fulfilled its promises or not.

   In all these problems the reasons are different.

This research, therefore, focuses on the nature of the different government organizations, nature of Enterprise resource planning (ERP), and nature of the employees of the public sectors competency, performance and behavior.

The research considers cases of Ethio-telecom, MoFEC (Ministry of finance and economic cooperation) and WWDSE (water works design and supervision enterprise).In doing so, it addresses the following major research questions:-

- ✓ What are the actual and potential benefits of Implementing ERP?
- ✓ What are the actual and potential challenges of Implementing ERP?
- ✓ If the existing practice (including the gap and problem) continues, what will be the consequence?

1.4 Objective of the study

1.4.1 General Objective

The general objective of this research is to examine the challenges and benefits of implementing Enterprise Resource Planning in ethiotelecom, MoFEC (Ministry of Finance and Economic Cooperation) and WWDSE (Water Works Design and Supervision Enterprise).

1.4.2 Specific Objective

- To examine the current implementation practice of ERP in ethio telecom, MOFEC and WWDSE and pinpoint strong area and areas that needs improvement.
- To show the benefits and challenges of implementing Enterprise Resource Planning
- To find out the possible solution for the ERP implementation challenge

1.5 Significance of the study

The findings of the research have both practical and theoretical significances, some of them were:-

- ✓ The company (both employer and employee) know the system and its practice in clear manner.
- ✓ It can be helpful for all responsible parties and stakeholders to understand their own strengths and weaknesses when implementing and practicing ERP in their companies.
- ✓ To inform the decision makers on the ERP system and other concerned about the problem at hand.
- ✓ It can be used as an input (reference material) for another researcher(s) from the companies and outside for further investigation.

1.6 Scope and limitation of the study

The scope of this research was three Ethiopian governmental organizations. On these specific companies, the researcher examined the benefit and challenges of ERP system implementation.

Branches of Ethiotelecom, MoFEC and WWSDE were taken. The researcher focused on the company's head quarter and its Addis Ababa's (Zone) offices. The main reason for selecting these geographical locations were:-

1. Many of the company's ERP system users were confined in this area.
2. Those employees who have been participating from feasibility study to system deployments phases for the selected companies were currently working on these areas.

Finally, the delimitation of this research was as the time implies the scope of this study was limited to the challenges and benefits of ERP implementation; it mainly focus on identifying and evaluating the potential challenges and benefits of ERP implementation starting from the go-live date of the implementation and recommends solution to the future identified problems. The researcher limited the scope of the study to include only three Ethiopian governmental organizations.

1.7 Organization of the study

This paper was organized into five chapters. The first chapter was about the background of the study, statement of the problem, objective of the study and scope and limitation of the study. The second chapter presented the review of related literatures of an ERP system and discusses related works in that area. The third chapter discusses the methodologies and procedures followed for the data collection, analysis and interpretations. The fourth chapter presents the data analysis, study findings, presentation and discussion of the results. The fifth chapter brings to an end of this research with conclusion and recommendations.

CHAPTER-TWO

LITERATURE REVIEW

2.1 OVERVIEW

In this chapter the theoretical context of ERP system was made based on the availability of previous scientific research. In addition, change management in ERP implementation related literature was reviewed to analyze existing research and to clearly show the research gap to justify the significance of this study.

With the aim of searching for literature to understand the theoretical background of ERP, the researcher attempted to retrieve a group of articles. The search parameters and synonyms that were used to logically guide the search engines included organizational background, Concepts of ERP, ERP benefits, ERP implementation, ERP Implementation in Public sectors, challenges of ERP implementation in Public sectors. Subsequent sections present different concepts related to ERP research works conducted elsewhere in the area of ERP.

2.2 The Concept of ERP

The business environment has changed dramatically. Nowadays, companies face serious challenges to manage in a competitive environment, to expand markets, to meet more and more specific requirements from customers, etc. This increases pressure on firms to reduce costs along the whole supply chain, shorten production time, increase productivity, reduce stocks, and improve service level for customers, among others. This has forced companies to change their way of operating. A significant difference is the tendency towards sharing critical information with suppliers, dealers and customers (Umble et al, 2003; Legris et al, 2003). In the same way, they face complex programs that tend to integrate the fragmented activities that existed in the internal operations of the firms (Teng et al, 1996; Kallio et al, 1999). These are some of the main reasons for justifying the implementation of new information systems, and if the organization integration is intended, the first option is ERP systems.

Business firms collect, generate, and store vast amounts of data and information which is unthinkable when managing without computerized information systems. More importantly, in

the absence of an ERP system, these vast amounts of data and information is spread across dozens or even hundreds of separate and mostly incompatible legacy computerized information systems; each handled by separate business units, regions and functions. Each of these silo legacy systems may provide important support for a particular business unit of an organization; however, enterprise-wide performance is hindered by the lack of integration (Daveport, 1998).

ERP systems are primarily designed to solve the fragmentation of information in large business firms by integrating and standardizing process flows of various functional units with the core concept of a single comprehensive database (davenport, 1998).The database collects data and integrates it into different modular applications to virtually support the entire firm's business activities across functions, business units, and across the world.

(Abdinnour-Helm et al, 2003; Mabert et al, 2003; Callaway, 1999) also had the same concept about ERP with davenport about having a common database and defined ERP as an on-line interactive system that support most key processes of an organization by using a common database that stores all the organization's data. These software packs expanded rapidly due to their advantages over the rest of the legacy systems high integration level, operation on the organization's business processes, allowance for reducing operative costs, etc. They provide a marked integration of processes through an improved and standardized workflow according to the best practices. All these advantages are not easy to achieve, implementing these software packs is extremely complex and implies a great challenge for the enterprise and it may take many years and may require a lot of money Davenport (1998).

ERP contains commercial software package that promises the seamless integration of all the information flowing through the company-financial, accounting, human resources, supply chain, and customer information Davenport (1998). Hence, a system should have the following crucial features/characteristics in order to be categorized as an ERP system:

- Different modules that automated various core organizational business processes such as finance, controlling, logistics, human resources, manufacturing, etc.
- Centralized and unified database for all business modules of the system

- Best business practice embedded on the business modules
- Seamless integration capabilities within ERP modules and also other computerized systems of the firm.
- Customization capabilities in order to cater for the specific needs of an organization that are not incorporated in the best practice of the system
- Business Intelligence (BI) tools to enable decision-makers to have an enterprise-wide view of information they demand in a consistent, reliable and timely fashion

Davenport (1998) in the below diagram that is anatomy of an enterprise system shows a central database that draws data from and feeds data into a series of applications supporting diverse company functions, by using a single database dramatically streamlines the flow of information throughout a business.

Davenport (1998), further illustrates the concept of ERP and its various modules with a diagram as shown in Figure 1

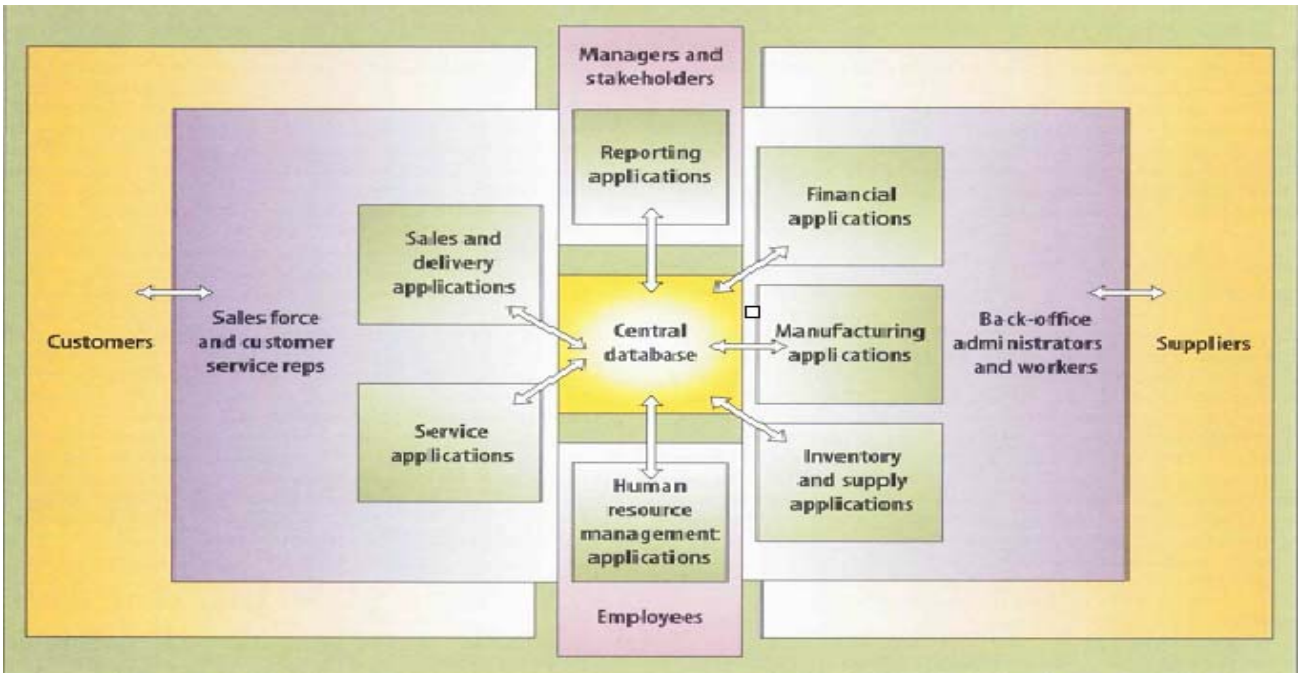

Figure 1: The concept of ERP systems (source: Davenport, 1998)

2.3 ERP System Benefits

In the last years, many enterprises acquired ERP systems to replace their legacy systems, attaining better integration of their functional areas. According to Umble et al (2003), ERPs provide two great benefits that cannot be found in the system departments of organizations:-

- A unified view of the company businesses involving all functions and departments
- A database in which all transactions are entered, registered, processed and monitored.

Shang and Seddon (2000) further defined list of ERP benefits from a review of 233 cases published in ERP vendors' stories. They also classified the benefits into five benefit categories: operational, managerial, organizational, IT infrastructure, and strategic.

Operational Benefits

Cost reduction: ERP systems can remove redundant processes which results in cost reduction.

Cycle time reduction: ERP systems can facilitate employee support, customer support, and supplier support that leads to measurable cycle time reductions.

Productivity improvement: ERP systems can improve employees' productivity. This improvement can be measured by different metrics such as the number of customer served by employee or the number of products produced per employee.

Quality improvement: Accuracy and reliability can be improved. In other words, reductions in error rates and duplication errors can be achieved.

Customer service improvement: The customer data is handled centrally in a unified manner regardless of the amount of data which makes it easier to deal with customer inquiries.

Managerial Benefits

Better resource management: an ERP system improves supply chain management which can lead to improved inventory management, reduced stock, and increased turnover. It can also help to better manage and utilize human resources based on their skills and experiences.

Better decision making: Due to the integrated nature of an ERP system it is possible to generate improved operative data that can be used by business managers to make better informed decisions about strategic planning and market responses.

Better performance control: Financial performance can be measured and controlled in different ways, either by customer, business, product, geography, or a combination of them which leads to an overall increase in operational management efficiency and effectiveness.

Strategic Benefits

Support business alliances: Alliances can be efficiently and effectively amalgamated with the organization's standard business practices.

Build cost leadership: ERP streamlines processes and shared services which makes it easier to achieve economies of scale.

Build external linkage: The system can easily be integrated with the systems of external parties such as business partners, suppliers, and distributors which improves business performance.

Enable worldwide expansion: A centralized world operation can be facilitated by the system that can handle global resource management and market penetration, allows operating in multi-currency, and the ability to provide solutions globally that are efficiently and cost effectively.

Customer service improvement: An ERP system can make it easier to deal with customer inquiries based on the centralized customer data available in the system.

Infrastructure Benefits

Increased business flexibility: The IT infrastructure that hosts ERP system supports stable and flexible business changes for the current and future expansions as well. This enables organizations to respond quicker, at a lower cost, and provide a range of options to internal as well as external changes.

IT cost reductions: ERP systems can lower costs by consolidating dispersed legacy systems since maintenance and integration of multiple legacy is costly.

Increased IT infrastructure capability: stable and flexible for the current and future business changes - ERP systems are stable; they are built on streamlined and standardized platforms. They promote continuous improvements and have global support. They bring flexibility with them since they are built on modern technologies. Finally they are extendable to other parties and expandable to a range of applications; and they are also customizable and configurable.

Organizational Benefits

Facilitate business learning and broaden employee skills: ERP systems can broaden employee's skills and facilitate shortened learning times.

Empowerment: ERP systems can facilitate providing value-added responsibilities to employees so that they can work autonomously. Moreover, it can be used to track accountability of employees based on their defined roles in the system.

Change culture with common vision: ERP systems are process based that promotes employees cross-functional and interdepartmental communication between employees. It also enables the vision to be consistent across different levels of the organization so that coordination and harmonization can be boosted.

Better employee morale and satisfaction: ERP systems "decision-making tools boost employees" problem solving capability which increases employee satisfaction and moral.

2.4 ERP Implementation

An enterprise system, by its very nature, imposes its own logic on a company's strategy, organization, and culture. It pushes a company toward full integration even when a certain degree of business-unit segregation may be in its best interests. And it pushes a company toward generic processes even when customized processes may be a source of competitive advantage. If a company rushes to install an enterprise system without first having a clear understanding of the business implications, the dream of integration can quickly turn into a nightmare. The logic of the system may conflict with the logic of the business, and either the implementation will fail, wasting vast sums of money and causing a great deal of disruption, or the system will weaken important sources of competitive advantage, hobbling the company (Davenport, 1998*)*

Likewise successful ERP implementation results from top management commitment and support that lead to overall organization commitment across an organization (Umble, 2002). Motwani, mirchandani et al added that the senior management who are involved in overall strategy of the company and that are not familiar with technical aspects must prepare for the challenges that might be faced.

On the other hand making the ERP system operative poses a series of important challenges for the enterprise and an important demand of human, technical and economical requirements and time consumption. According to Gottschalk (1999), in many cases, the definition that considers when to implement the system is an issue that needs to be discussed. It is also a discussion topic when all the value the ERP system can provide for the enterprise has been achieved (Davenport, 1998). It greatly affects the enterprise's health, and in case of problems, the company processes can be blocked and this may bring about serious drawbacks into the organization (Kumar et al, 2002).

Huang & palvia (2001) believe that the implementation of ERP is affected by two broad categories of factors: national/environmental and organizational/internal, each of which comprises below five variables.

1. Economy and economic growth*:* Economic status of a nation is a broad indicator of its IT/IS development. Rapid economic growth fuels IT/IS development because enterprises are eager to gain.

2. Competitive advantage: Thus sound economic background provides a solid foundation for IT/IS development as well as ERP implementation.

3. **Infrastructure:** Infrastructure, including both basic and IT infrastructure, constitutes the basic prerequisite for ERP implementation. ERP cuts across several functions, including the internal Operations of the company itself and its suppliers, customers, banks, etc. The soundness of the entire infrastructure is necessary to facilitate complete value chain management enabled by ERP.

4. **IT maturity:** The level of IT maturity can significantly influence an organization's strategic decision in acquiring and deploying IT/IS. IT mature organizations have better understanding of IS implementation, can collaborate effectively with ERP vendors, and is more likely to succeed in ERP implementation.

5. Computer culture: Although somewhat related to IT maturity, this refers to the company's history of computing, employees' attitudes towards computers, and organizational dependence on

computers. A company with a strong culture would have better understanding of application functionality, data management, and more accepting of ERP systems.

In addition, ERP systems are not made to meet the organization's requirements but they have to be parameterized according to the business processes of the organization. It is not an easy task since it brings about a great change in the organization. It is crucial since the organization business processes are modeled to operate on the system. In that way, all the business logics of the company is shaped.

Implementation can be defined as a decision making activity that turns a conceptual design into an operative reality that can provide value to customers (Marble, 2003) and for implementation to provide users with value, all their requirements must be met. (Marble, 2003) also states that top management prioritizes an implementation project only because it is indirectly associated to improving user's satisfaction. Only when this priority exists in the management of a continuous development and growth, the top management support is valuable for users.

In addition successful Implementation of ERP systems have strategic, tactical and operational benefits for institutions in the form of transformational, traditional and transactional benefits respectively Beadles, Lowery, & Johns (2005).

Transactional activities involve day-to-day transactions that have to deal mostly with record keeping—for example, entering payroll information, employee status changes, and the administration of employee benefits.

Traditional activities involve ERP programs such as planning, selection, training, compensation, and performance management. These activities can have strategic value for the organization if their results or outcomes are consistent with the strategic goals of the organization.

Transformational activities are those activities that add value to the organization—for example, cultural or organizational change, structural realignment, strategic redirection, and increasing innovation

Davenport (1998) defined that the ERP systems are profoundly complex pieces of software, and installing them requires large investments of money, time, and expertise. But the technical

challenges, however great, are not the main reason enterprise systems failed. The biggest problems are business problems. Companies fail to reconcile the technological imperatives of the enterprise system with the business needs of the enterprise itself. Due to this though it's true that enterprise system can deliver great rewards, but the risks they carry are equally great. He also recalls to the managers to be careful when considering and implementing an enterprise system about their enthusiasm of the benefits not to blind them to the hazards.

ERP implementation involves more than changing software or hardware systems. Ideally, by reengineering business processes, ERP implementation can help an organization to benefit from higher levels of efficiency and improved performance Ehie & Madsen (2005). Therefore, ERP implementation may cause changes that lead to resistance among employees (Glover, Prawitt & Romney, 1999). Consequently, balancing conflicts between staff and technology and effectively managing employees in the change process are key elements for the successful ERP implementation (Ash & Burn, 2003).

2.5 Critical Success Factors for ERP implementation

Rabaa'i (2009) researched previous studies identifying critical success factors (CSFs) for ERP implementation. The study presents the top 12 most frequently cited CSFs, that are the Top management commitment and support, change management, project management, business process re-engineering and system customization, training, ERP team composition, visioning and planning, consultant selection and relationship, communication plan, ERP system selection, ERP systems integration, and post-implementation evaluation measures.

Project management

Effective project management is critical for the successful ERP implementation (Haft & Umble, 2003; Nah & Delgado, 2006). Bingi, Sharma, & Godla (1999) found that a lack of proper understanding of the project needs and the inability to provide leadership and guidance to the project are the main factors when ERP implementation fails. Thus, effective project management should define clear project objectives, develop a work and resource plan, and carefully track the project's progress.

Business Process Re-engineering and system's customization

There are two approaches to implementing ERP systems in an organization: reengineering business processes and ERP customization (Shehab, Sharp, Supramaniam & Spedding, 2004). Business process reengineering creates deep changes in organizational processes in order to fit them to ERP functions. On the other hand, when an organization wishes to maintain its existing processes using an ERP system, it can customize ERP functions. However, many researches indicate that ERP customization should be avoided or minimized in order to achieve the full benefits offered by ERP systems (Shanks, Parr, Hu, Corbitt, Thanasankit & Seddon, 2000, light 2001; Bajwa, Garcia & Mooney, 2004).

Training

End user training has been recognized a critical factor for ERP implementation (Bajwa et al, 2004). Due to the complexity of the integrated ERP system, end user training is essential for a robust understanding of how the system works and how to use it. Consequently, appropriate end user education and training will maximize ERP benefits and increase user satisfaction.

ERP Team Composition

Since ERP covers diverse functional areas across an organization, ERP team composition is also important for the successful ERP implementation; an ERP project team should consist of representatives from all functional units related to ERP.

Consultant selection and relationship

ERP consultants play a critical role in ERP implementation. Consultants can be essential knowledge resources for ERP's hardware, software, and personnel. They also can help staff, have responsibility for project management, and audit the project. On the other hand, in order to be successful system maintenance after post-implementation, knowledge transfer from consultants is crucial for the organization.

Communication plan

Strong communication within the entire organization during the implementation process increases success for ERP implementation. It allows the organization's stakeholders to

understand the goal and the expected benefits of the project as well as to share the progress of the project. An "open information policy" protects the various communication failures for the project (Al-Mashari, Al-Mudimigh & Zairi, 2003), While the critical success factors can lead to success of ERP implementation, they do not guarantee it. Al-Mashari, Al-Mudimigh, & Zairi (2003) state that the delivery of the critical success factors is one major condition to lead to benefits from ERP implementation, and they suggests that IT projects can be considered successful as according to the following terms:-

- Correspondence success, which occurs when there is a match between IT systems and the specific planned objectives.
- Process success, which occurs when IT project is completed within time and budget.
- Interaction success, which occurs when user's attitudes towards IT are positive.
- Expectation success, which occurs when IT systems match user's expectations.

2.6 ERP Implementation in Public Sectors

ERP systems are increasingly being implemented in the public sector. And, despite the downturn in the global economy, there has been a worldwide trend of ERP implementations in the public-sector. Integrated real-time information, better administration, and result-based management are some of the various benefits for increasing ERP adoption (Alves & Matos (2011).

Though ERP system can facilitate the smooth flow of common functional information and reduce cycle times. However, without top management support and an appropriate business strategy, plan and vision, the reengineering of business processes, effective project management, user involvement and education and training, government agencies cannot embrace the full benefits of such complex systems (Thomson, 2010).

According to Thomson (2010) senior management in government who are seeking cost savings and improved effectiveness and efficiency may undertake a review of their current e-procurement data arrangements. Large, medium and small governments around the world are

considering or reconsidering enterprise resource planning (ERP), and are looking for guidance as to how ERP can be used with highest amenity, lowest cost and least change.

2.7 Challenges of ERP Implementation in Public sectors

The implementation of an ERP system in an organization is very complex. The implementation of such systems is difficult and involves a high costs, as well as considerable time and resources. Organizations contemplating must be aware of the necessary commitments. The most important thing is that the implementation of ERP is a major event in the life of an organization. An ERP system is expected to change a lot of business, processes, and activities within the organization and often initiated with much expectation about the benefits and the transformation that the project would bring to the organization (Ibrahim, 2010).

Likewise ERP implementation is also difficult and can be politically charged in government organizations, which is often structured into nearly independent functions, each having different processes, business rules, data semantics, authorization hierarchies and decision centers (Thomson, 2010) and also the implementation can cause significant centralization of arrangements, such that once implemented may then limit the freedom and flexibility or needs of governments to adapt quickly to environmental changes without incurring significant costs, lengthy duration, significant change management and organizational turmoil.

Senior management in government who are seeking cost savings and improved effectiveness and efficiency may undertake a review of their current e-procurement data arrangements. Large, medium and small governments around the world are considering or reconsidering enterprise resource planning (ERP), and are looking for guidance as to how ERP can be used with highest amenity, lowest cost and least change. They have variously considered ERP as a pervasive government wide tool for coordinating many activities such as e-procurement, HR, project management, finance, and budgeting. This adoption has been because downsizing and outsourcing pressures to reduce costs have been and will continue to be intense. While the adoption of ERP has been viewed as a means of reducing costs, in practice such implementation often increases costs, In addition to the cost, ERP data is often spread throughout different organizational functions such as accounting, project management, purchasing and procurement, and supply logistics and its suggested that such data is a key value driver (Thomson, 2010).

But still in many government organizations it remains an untapped source of core government business data. It could be that this is because its value is not recognized by governments, or that some or all of ERP functions have been outsourced to an external provider and so have become opaque to management. Whilst it may be an attractive option, outsourcing such a core function may lead to becoming dependent upon external; often rent seeking, ERP vendors. Such rent seeking can take the form of demands for system and software adoption and subsequent upgrades, specialist training for staff, ongoing license fees on a per user basis (so limiting the number of users within the e-government agency because of the cost per user), consultancy fees, and special service fees and so on. Once committed to such ERP arrangements, it is difficult for the e-government agency to break out of such contracts without suffering heavy expense. But to remain in the arrangement is also very expensive it becomes a most effective monopoly for the ERP vendor (Thomson, 2010).

Although there have been some successes, there have also been many failures, Public sector ERP solutions have been difficult to scope, manage and implement in accordance with best industry practices and generally accepted project management principles (Sommer, 2005).So knowing this, public sector organizations must understand the factors that contribute to the multitude of problems among their ERP projects. Failure to address these issues puts future funding streams at great risk.

2.8 Change Management and ERP implementation

Change management is a primary concern of many organizations involved in ERP project implementation; Hawking & Stein (2004) identify change management, in terms of adopting an ERP system, as activities, processes, and methodologies that support employee understanding and organizational shifts during the implementation of ERP systems and reengineering initiatives.

Change management is a process that helps the management for the implementation of appropriate planned change for the development of the organization (Al-Shamlan & Al-Mudimigh, 2011). Mandal & gunasekaran (2003) also define change management as an activities associated with the interaction of technology, processes, and people. Project team and end-user

training, the understanding of new processes, communications, and job redesign are some of the main activities that comprise a Change management strategy.

The existing organizational structure and processes found in most companies are not compatible with ERP systems structure, tools, and types of information. Even the most flexible ERP system imposes its own logic on a company strategy, organization, and culture. Thus, implementing an ERP system may force the reengineering of key business processes and/or developing new business processes to support the organizations goals (Dixit & Prakash, 2011). Also, ERP implementation requires a massive change in an organization's structure and affects the way people use to do work and interact.

It is important that an organization goes through a carefully planned transformation that is based on adequate strategy and well defined methodology and processes of implementation. The resulting changes may significantly affect organizational structures, policies, processes, and employees. Change management can be considered as a special case of risk management (Ash & Burn, 2002). On the other hand, change management has been recognized as a planned Process of change in an organization and is feeble for a smooth transition from the current status to a developed status (Al-Shamlan & Al-Mudimigh, 2011) and the authors added that we can classify change management depending on the organizational purpose. These are Incremental/Continuous change and Transformational or Major Change.

Incremental/Continuous Change is an integral process to a particularized ongoing change management process. It basically concentrates over the functionalities of planning, followed by supervising and the process of budgeting. Transformational change on the other hand has various kinds of conventional change management proceedings and is little far from the upgrade version of the implementing it in modern structure. In general, the transformational change is more risky than incremental change and it is needed more experience in change management strategies and processes.

Generally, the main challenge of ERP implementations is to manage the elements of change in the organization so that the intended, desired changes are implemented successfully and the unintended surprises that could lead to failures are avoided. ERP systems impose their own logic

on organizations and this may be a source of cultural conflicts (Smeds, 2010). Cultural changes are probably the most difficult kinds of changes to identify and manage because culture is something quite difficult to grasp (Ahmed, & Zbib, et al, 2006), the authors also added In a company, its culture often reflects the implicit beliefs, assumptions and values about what behaviors are believed to lead to success and as tacit, they are hard to identify and change.

2.9 Chang Management Processes

The efficient change management processes lead to success an ERP system. The empirically validated, best–practice model developed by Clarke & Garside (2004) consolidates change management activities into five major groups. These are commitment, people, communication, tool and methodology, and interaction.

The **commitment** construct covers recognizing the level of change needed, ownership, and the provision of adequate resources.

The **People** dimension relates to the social and cultural aspects of Change.

The **Communication** covers issues related to internal and external communication. For instance, communicates project scope, objectives and activities to all people involved. In addition, employees should be updated through organizing focus groups, publishing newsletters, and making use of e-mail messaging system and web 2 technologies like face book or twitter. The **Tools and methodology** construct relates to training, education and other tools necessary to ensure effective and smooth change.

The **interaction** deals with the synchronization of change with other operations happening in the organization .For example, manages to play the role of integrator and leader of a major strategic alliance initiative bringing together suppliers, customers and consultants.

In essence, (hawking & stein, 2004) point out that the tools of management of change are leadership, communication, training, planning, and incentive systems. They urge that these tools can all be used as levers and can move great obstacles with a minimum of efforts when applied correctly.

Moreover, Training, re skilling and professional development of the IT workforce is critical and it is important driver of ERP implementation success (Smeds, 2010). User training should be

emphasized, with heavy investment in training and re skilling of developers in software design and methodology. Smeds (2010) also added employees need training to understand how the system will change business processes. Moreover, training offers a good opportunity to help users adjust to the change that has been introduced by the ERP system, and helps build positive attitudes toward the system.

Furthermore, training provides hands-on experience for the users they appreciate the quality attributes of the system and its potential benefits, there should be extra training and on-site support for staff as well as managers during Implementation. A support organization (e.g. helpdesk, online user manual) is also critical to meet users' needs after installation.

2.10 Related Works

Almishal & Alsaud et al. (2015) make a survey to evaluate the overall progress of ERP in Saudi Arabia at government sector. The major finding of the study were the organization implement ERP system with change management processes was more success as compared to an implementation without change management processes. The gap of this paper was their paper mainly focuses on the phases of implementing ERP with key strategies to be considered on each phase for effective ERP Implementation in public sector.

Ahmed et al (2006) had studied resistance to change and ERP implementation and test the impact of resistance to change on ERP's implementation success and how change management initiatives acts in the capacity of a moderating role by conducting data collected from sixty nine organizations through a mail survey. In his study it's posited that resistance may be viewed from two different angles, such as attitudinal and behavioral responses to change and can be defined as a phenomenon which can deter the overall change process, either by delaying or slowing down its beginning, obstructing or hindering its implementation, and increase its costs.

The researchers used questionnaires and interview as the primary sources of data collection and also a pilot test was conducted to verify the various dimensions of the questionnaire such as language used and layout as well as ease of completing the questionnaire. Accordingly, findings have shown that resistance to change is negatively related to achievement of predetermined goals

and to user satisfaction, it also emphasis In order to facilitate a smooth ERP implementation, organizations must be competent in effective change management that involves all the affected personnel's to accept the introduced changes as well as manage any resistance to them.

The main gap of their research was though the researcher's objective was to determine the impact of resistance to change on ERP implementation success the respondents were managers and executives from all the organizations only, end users who directly use the system in a daily bases were not included in the survey. Hence the current study attempted to use a combined approach of quantitative and qualitative techniques in order to address this gap and minimize bias.

Currently, there are scarce research attempts made on ERP in the context of Ethiopia. Accordingly, three research studies were found that are explained below:

Derese (2013) had conducted a research on ensuring successful implementation of ERP at Ethio-Telecom, a government company. The main objective of the study was to present experiences that are obtained from a successful ERP implementation project while the case study organization implemented Oracle ERP system. As a research methodology, the researcher used a case study approach with qualitative and quantitative methods. The researcher developed a framework that identified CSFs that needs to be addressed during pre-implementation, implementation and post-implementation phases. However, the study mainly focused on the implementation phase of ERP adoption even if the framework tried to address the three major phases. Besides, the researcher also recommended conducting a comprehensive empirical study further understand the direct and indirect relationships among the critical success factors and the actual benefits of ERP adoption.

Elsa (2015) had studied ERP Post-Implementation Management Framework by conducting the research in Ethiopian Airlines**.** The main objective of the study was to investigate technical, organizational, and operational issues of ERP post-implementation management in the context of Ethiopian airlines and designed a solution framework to address those issues.

The researcher used interviews and observations as primary sources of data collection whereas online archival and paper documentation were used as secondary sources of data. Accordingly an

ERP post-implementation management framework was designed to address the identified technical, organizational, and operational ERP utilization issues.

The study attempted to answer the research question that explores if there was any change management strategies and implementation within an organization and explore the challenges and barriers that exist in ERP system implementation.

Thesis on the CSFs of ERP implementation using a case-study at Ethiopian Airlines was conducted by Sintayehu (2014). The objective of the study was to investigate CSFs and sharing experiences to other Ethiopian organizations with similar context and environment. As a main data collection technique he has used qualitative type case study using interviews, observations and an online surveys questionnaire. Accordingly, the study identified twenty factors to be critical for the success of ERP system's implementation in the context of Ethiopia. Yet this study falls short of addressing the post-implementation factors that determine the success of ERP assimilation to achieve business results out of the implemented system.

The following table presents the summary of related works according to objective, methodologies, key findings, recommendation and limitations.

Table 2.1: Summary of Related works

Author, Title and Year	Objective/purpose	Approaches/Methodologies	Key findings	Recommendation and future work	Remark
Zafar, U. Ahmed et al Resistance to change and ERP implementation (2006)	Resistance to change and ERP implementation and test the impact of resistance to change on ERP's implementation success and how change management initiatives acts in the capacity of a moderating role by conducting data collected from sixty nine organizations through a mail survey	Questionnaires and interview as the primary sources of data collection	Resistance to change is negatively related to achievement of predetermined goals and to user satisfaction, it also emphasis In order to facilitate a smooth ERP implementation, organizations must be competent in effective change management that involves all the affected personnel's to accept the introduced changes as well as manage any resistance to them		
Derese,A Ensuring Successful Implementation of Enterprise Resource Planning (ERP): The case of Ethio-Telecom (2013)	To develop/design a framework to address factors for ensuring successful implementation of ERP in organizations	A case study with semi-structured interview as the main source of data collection used	A framework proposed on critical factors that need to be focused on each phase of ERP implementation	Additional case study research recommended studying the direct and indirect relationships among CSF's and the actual benefits of ERP implementation .Moreover, study on ROI of ERP utilization during post-implementation phase was also recommended	The study mainly focused on the implementation phase of ERP adoption even if the framework tried to address the three major phases namely pre-implementation implementation and post-implementation

Elsa, T ERP Post-implementation management framework : the case of Ethiopian Airlines (2015)	To investigate technical, organizational and operational issues of ERP post implementation success in the context of Ethiopian Airlines and design a solution framework to address those issues.	A case study in which a combination of quantitative and qualitative methods has been used to collect and analyze data.	Identify the technical, organizational, and operational issues of ERP post-implementation in Ethiopian Airlines, And propose ERP post-implementation management framework to improve the identified core issues.	Executing the proposed framework by focusing on organizational theme as a priority goal in order to improve the utilization of the system and attain post-implementation success.	
Sintayehu,D. Critical Success Factors for Implementation of ERP system : The case of Ethiopian Airlines (2014)	To find out the factors that determines the success of ERP implementation.	A case study with questioner as the main source of data collection used.	Identified twenty critical success factors of ERP implementation	Recommended to study ROI of ERP system adoption and usage for better use of already implemented ERP systems.	The study addressed CSFs for the ERP implementation Hence, post-implementation success was out of the scope of the study.

CHAPTER-THREE

RESEARCH METHODOLOGY

3.1 Introduction

The research method is the significant part of a research because it helps researchers to decide how to achieve the specified objective, what data to collect, how to collect and analyze the data in order to solve the problem area. Therefore, it needs much attention on choosing the appropriate methods which can provide the desired outputs.

This chapter presents the research methods. It deals specifically on the research design, sampling procedure, data collection methods, procedure of data collection and method of data analysis in order to develop methodology to address research questions and at the end some ethical issue and validity and reliability issue explained.

The variables that the research collected by questionnaire (see Appendix-A) are the benefits (Transactional, Traditional and Transformational) and challenges (human- factor and other) and the variables addressed by interview (see Appendix-B) are organization's motivation for adopting ERP, challenge and benefits encountered during implementation process and now , lessons learned and next action plan regarding ERP.

3.2 Research Design

The objective of the research was to describe the practices and challenges of ERP implementation in ethio-telecom, MoFEC and WWDSE, so for the research which has the above mentioned objective, descriptive type of research is better, therefore the research design for this study is Descriptive. Descriptive researches are those studies which are concerned with describing the characteristics of a particular individual, or of group and it includes surveys and fact-findings enquire of different kinds (Sakaran, 2013).

Due to the nature of the research and to achieve the specific and general objectives of the study, a mixed quantitative and qualitative method is used to analyze the collected data. According to Creswell (2003), the use of both approaches is important so that the overall strength of the study is greater than either qualitative or quantitative research. Thus, this design is selected to express the current phenomenon of a situation and gives prediction depending on the finding of the research and to describe the basic questions stated in the research. This research study was an academic research, which had to be completed with limited available resources: both time and money. Therefore a survey strategy used to collect large amount of data using a questionnaire and interview from a sample population in a highly economical way is used.

3.3 Population and Sampling techniques

3.3.1 Research population

The primary aim of this study was to identify the challenges and the benefits of the ERP implemented in three Ethiopian governmental organizations. Among few public sector institutions which implemented ERP, purposive sampling was used to pick institutions from different sectors. As a result the study considered Ethio-telecom, MoFEC and WWDSE which successfully implemented different ERP system in their respective institutions since 2011.

The three governmental organizations were selected for this study according to the availability of ERP in the organizations and organizations willingness to participate on the data collection. Thus, this study focuses on only three Ethiopian governmental organizations which are engaged in different sectors so as to make the population a representative of different kind of organizations.

3.3.1.1 Ethio-telecom

As of February 15, 2016 ethio telecom has 12,020 permanent employees all over the country. Structurally locations of employee's are categorized in to three parts. They are corporate employees, zone employees (6 zones in Addis Ababa) and region employees (12 regions all over the country).From the total population (permanent employees) 7461 are located in Addis Ababa

and the rest i.e. 4559 are out of Addis (region employees).From the total of Addis Ababa employees 5386 are working in head quarter and the rest are zone employees.

Generally a representative of the total population was included in the research study. All parties involved in the implementation process of ERP system were represented by the sample. As a division, human resource, finance, supply chain management (sourcing and facility) and project management were taken. So above listed departments was the basic source of the information as they used the system for more than two years and this made the information more valid.

Out of the 7,461 Addis Ababa employees, the total numbers of the employees who use the ERP system are 2781 .Because of the geographical constraint; the study is conducted on Addis Ababa. Moreover, studying different zones and regions will not bring significant difference since the company follows centralized management system most of the activities are similar. Therefore, the researcher focused on head quarter human resource, finance, supply chain and project management division's employees of the company who are using the system as a sampling frame of the study.

3.3.1.2 MoFEC (Ministry of Finance and Economic Cooperation)

As of February 15, 2016 MoFEC has 570 permanent employees. The populations of the study were MoFEC operational employees, operational managers, directors and executives who directly use IFMIS ERP system for their day to day operational, managerial and strategic business activities as well as decision making.

Out of the total permanent employees, HR, Budget, Treasury, Finance, Inspection, internal Audit, government audit, information system, general service and macro department are using the IFMIS system.

According to Oracle license data of MoFEC, 310 employees who work in the listed departments use the IFMIS system for their main day to day business activities. Accordingly, 310 core users was considered as valid target population of the study since they use the IFMIS Oracle system as their major IT solutions for their core business functionalities and decision making.

3.3.1.3 WWDSE (Water Works Design & Supervision Enterprise)

The population of the study are WWDSE operational employees, operational managers, directors and executives who directly use cyber-ERP system modules (IFMS, HRMS, RMIS, TFMS, PSMS, PMS and SRMS) for their day to day operational, managerial and strategic business activities as well as decision making.

The respondents of the survey are operational level employees, supervisors and middle management members who use the cyber-ERP system for core business activities of their respective business areas. For the qualitative study, executive management members and business directors are selected and interviewed to gather their experiences and insights.

According to cyber-ERP license data of WWDSE, 718 employees who work in HR, Finance, Record and Archive, fleet and Maintenance business unit and IT divisions use Cyber-ERP system for their main day to day business activities. Accordingly, 718 core users was considered as valid target population of the study since they use cyber-ERP system as their major IT solution for their core business functionalities and decision making. Hence, the target population of the study embraced 718 cyber-ERP core users.

The population includes employees of each organization working on an already developed and implemented ERP system which was implemented in the above departments. So the respondent of the survey was employees of the specific organizations that use the ERP system for their day to day business operations. In addition, for the interview the managers, team leaders and supervisors in the three public organizations were included.

3.3.2 Sample Design

Due to limitation of cost and time associated with the inclusion of all the target population sampling method was used. In addition Greenfield (2002) defines considering the issue of quality and feasibility; concentration of effort on a sample can increase the quality of the research, which leads to results that are more accurate. This show designing the sampling process of the research is essential to achieve the objective of the research. Accordingly, the following sample design of the research was undertaken.

3.3.2.1 Sampling Method

Because of lack of a reliable sampling frame, it is difficult to conduct a random sampling in each of the three public organizations. Thus, in this study for purposive sampling technique is used to select staffs working on an implemented system. The researcher purposely selected staffs that use the ERP system for their day to day work operation. Managers and team leaders were also considered purposively as they were considered to have more in-depth knowledge about the overall ERP implementation.

3.3.2.2 Sample Size

For this study, the samples are selected from the three public organizations that implement and use different ERP modules. In this regard, data from 114 numbers of employees in the three public organizations that use the ERP system for doing their day to day business activity were collected. The sample size is limited on the basis of the number of ERP system used in the organizations and the number of respondent willing to participate on the study. Out Of the 144 distributed questionnaires, 114 were completed and returned.

3.4 Data collection methods

The data was collected from employees, managers and team leaders of the three public organizations using questionnaire. Then, interview was held to get detailed information about organizational attributes of the ERP implementation and to clarify whenever there are doubt and unclear situations faced. For the interview the department managers, team leaders and supervisors of the three organizations are participated.

3.4.1 Primary data

Primary data are those that are gathered for a specific purpose or for a specific research project. In this research to collect the data the researcher used questionnaire (see Appendix-A) adopted and modified from Beadles, Lowery, & Johns, (2005), Batool, Sajid, & Raza (2012), scientific standardize questionnaires and semi-structured interview (see Appendix-B) adopted from (Troshari, Jerram, & Hill, 2011).

3.4.1.1 Questionnaire

For this study the questionnaire generally contains close-ended questions. The questionnaire was prepared after extensive review of literatures in this field, the questionnaire items focused on the research problems objective and questions rose in the statement of the problem. Thus, to ensure content validity of the scales, the items chosen for the constructs were adapted from previous research to ensure content validity.

The questionnaire was self-administrated to the participants and they were consisted of scale questions to collect opinions. Five point Likert-style rating scale (1: strongly disagree, 2: disagree, 3: neutral, 4: agree, 5: strongly agree) were used when designed the questionnaire.

The questionnaire (see Appendix-A) basically has three parts. The first one is demographic information, and the second part is about the benefits and challenges of implementing the ERP system in the public organizations and finally open ended questions regarding the topic. It is done intentionally since one characteristic of good questionnaire is to start with simple factual, moving on later to items of opinion or values (Armstrong (2009). The variables that the researcher collected by questionnaire are transactional benefits, traditional benefits, transformational benefits, human factor challenges and non-human factor challenges about ERP.

For the data collection paper based survey was conducted. Before distributing the questionnaires the researcher communicated with each of the three public organizations ERP and IT department team leaders. This helped to discuss if the organizations have any internal online survey collection mechanism and the tendency of the employees on using online mechanism. But the availability of online survey and capability of respondent on using the online survey were limited. Thus, the researcher distributed the paper based questionnaire in person to all the three organizations. At the time of the data distribution respondents email address and phone number, if they had any and willing to give, was collected. So, in organization where the response rate was low the respondents were contacted through phone and email to get their feedback and increase the response rate.

3.4.1.2 Interview

For this research, semi- structured interview were used for qualitative data analysis. Personal interviews with management officials, department team leaders of the three organizations is undertaken to support the data collection method. The interview outline was organized in regard to each organizations profile, number of users of the ERP system and the organizational and environmental attributes. Total of 12 individuals participated in the interview, the interviewees were considered as the key persons involved in the ERP implementation decision-making process. The interview outline was organized in regard to each organizations profile, number of implemented ERP modules in each organizations and the organizational and environmental attributes.

The interview was taken in the respondent's office by scheduling the time and date in prior so that the respondents will be free to express their ideas. In addition, the interview was taken before and after the collection of the questionnaire so as to clarify some issues that were vague in questionnaire analysis.

Before starting the interview sessions, the interviewer first introduced herself and then continued by explaining the aims of the study and how the interview would be carried out. The interview topics included the company's background, the awareness level of the interviewee on the overall ERP system implementation, and the impact of the organizational factors on the ERP system. The interviewer assured the informants that all information would be treated confidentiality. In order to avoid bias; the interviewee was given the opportunity to discuss concrete examples and stories rather than directing or suggesting them how they should answer. As soon as the interviewer finished the interview sessions, the results were transcribed then sent to the respondents for refinement if needed.

The variables addressed by interview (See Appendix-B) are organization's motivation for adopting ERP, challenges and benefits encountered during the implementation process and now, lessons learned and next action plan regarding ERP .

3.4.2 Secondary data

In this study, secondary data were collected from organizational reports such as company dash board report, system reports, processes and employment records, published articles, books, Theses, websites and related studies on ERP system were examined. Acquiring secondary data are more convenient to use because they are already condensed and organized. Moreover, analysis and interpretation are done more easily.

3.5 Pilot Testing

The questionnaire and interview outline contents were prepared by adopting from existing literature. So in order to test the validity and reliability of the questionnaire a pilot study was conducted with a sample of 18 purposively selected ERP users. All of the participants filled the questionnaire, which indicated 100% response of the pilot study. In accordance with the pilot test feedbacks, the questionnaire was amended to improve the clarity of the questions, further, to measure the internal consistency of the questionnaire, reliability test was conducted. Accordingly, Cronbach's coefficient alpha was used as a reliability criterion with the help of SPSS. The result (0.81) obtained is greater than 0.70 which is the minimal alpha value to prove the internal consistency and reliability.

3.6 Data Analysis

The 117 questionnaires collected from respondents were first checked to identify any damaged questionnaire. Accordingly, 3 were discarded since the response was not reliable. The usable sample size became 114. Then, the 114 questionnaires were sorted. After sorting each questionnaire was coded with unique number. After the coding process was completed, each questionnaire's 27 items were inserted in to computer (SPSS).

The collected questionnaires and interview verified carefully for the completeness and clarity of the responses. For data analysis, SPSS (statistical package for social science) version 22 software used to code all the required variables. Accordingly, the questionnaire items were coded and the data imported to SPSS tool. To summarize the collected data Descriptive statistics methods such as frequency distribution, mean and median, cross tabulation and graphical representation methods are used.

For the data's that was collected by semi-structured interview questions and open ended questions, it was presented and interpreted using narrative analysis based on the theme's i.e. the benefits of Implementing ERP, the challenges of implementing of ERP and consequence of continuing existing practice. The goals were to integrate themes and concepts in to a theory that offers an accurate, detailed and subtle interpretation of the research arena. Since the approach is mixed each qualitative data changed to quantitative data to make the result objective and generalize on the organizations.

Here mean score and frequency were calculated to determine the level of agreement respondents to each question. With five point scales, the intervals for breaking the range measuring each variable are calculated as follows:

Ranges = (Max-Min)/5 = (5-1)/5=0.8= agreement level

The translation of level of ranking is analyzed based on the following criteria designed by Vigderhous (1977).

Agreement level 1.00-1.80 means strongly disagree

Agreement level 1.81-2.60 means disagree

Agreement level 2.61-3.40 means neutral

Agreement level 3.41-4.20 means agree

Agreement level 4.21-5.00 means strongly agree

3.7 Quality of Research

Reliability and validity are mostly raised in conducting quantitative research. While preparing the questionnaire ambiguous or vague wording was avoided to ensure that respondents would read and answer the question consistently on different occasions in the same context. Moreover, reliability and validity of the study is acquired through analyzing data from different sources. The data from different sources can help for cross checking the information obtained. At the same time, the reliability was gained during the analysis part when those proved information would interpret in consistent manner.

3.7.1 Reliability of the research

Greenfield (2002) defined reliability as "the consistency or repeatability of the measure". Reliability is especially important if the measure used for an on-going basis to detect change. Purposive sampling such as timing of data collection, structure of interviews and data triangulation makes this research reliable. On the other hand, unstructured interview held by the researcher gives strength on the reliability of the information collected from the respondents than structured interview.

The internal consistency of this study checked with the Cronbach's alpha. This is a single correlation coefficient is an estimate of the average of all the correlation coefficients of the items within a test. If alpha is high (0.70 or higher), then this suggests that all of the items are reliable and the entire test is internally consistent (IBM SPSS statistics, 2013). In this regard, the Cronbach's alpha for this study is 0.81 using the SPSS software package this shows the items are reliable and the entire test or questions are internally consistent.

3.7.2 Validity of the research

Validity as it has been stated by Greenfield (2002), is a way of checking that the study is measuring what was intended to measure. There are different types of validity measurements including content validity and construct validity. The content validity was assured when the questionnaire was prepared based on extensive reading of literature review. Moreover, before the process of combining the attributes depending on their categories factor analysis test was done to test construct validity. Construct validity is a data reduction technique and the principal component analysis method which explains the relationship between variables.

CHAPTER - FOUR
FINDINGS AND DISCUSSIONS

4.1 Overview

In this chapter, the first section presents quantitative data analysis using SPSS.Accordingly data summarization frequency, percentage, means and standard deviation value is used. In addition, different statistical methods are discussed for the finding of the benefits and challenges of ERP in the public organizations. The second section presents the qualitative data narrative analysis. The last section of this chapter presents discussion of findings of quantitative and qualitative data analysis.

Table 4.1 shows the total number of questioners distributed and collected from the three public organizations.

Table 4.1 Number of distributed and collected questionnaire

No.	Name of the organization	Number of Questioners		
		Distributed	Collected	Percentage (%)
1	Ethio Telecom	50	42	84
2	Ministry of Finance and Economic Cooperation (MoFEC)	51	38	76.47
3	Water Works Design & Supervision Enterprise (WWDSE)	43	34	79.54
	Total	144	114	80.17

In general, the total number of questionnaires distributed was 144 and the returned questionnaires are 114 with a response rate of 80.17%.Initially the questionnaire response rate was 68.6 % to increase this response rate redistribution of the questionnaire was undertaken which helps to improve the response rate by 11.57%.

The frequency of the data collected from each organization is presented in table 4.2.

Table 4.2 Organization frequency

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Ethio-Telecom	42	36.8	36.8	36.8
	MoFEC	38	33.3	33.3	70.2
	WWDSE	34	29.8	29.8	100.0
	Total	114	100.0	100.0	

4.2 Quantitative Data Presentation and Analysis

4.2.1 Presentations of Respondents Background

This portion of the survey is concerned with background of the respondents to understand the employees or respondents who participate in filling the questionnaire for this research. To present the background characteristics, frequency tabulation is used. Respondents are requested to fill their sex, age, their level of education and their present work position in the organization and year of work experience. The profile of respondents is presented in table 4.3.

When we look the respondent gender wise, 71.6% of the respondents are males whereas only 26.7% of the respondents are females. This shows more of the respondents are male.

When we see the respondent by age range 51.7% respondents are categorized in age range between 26-35 years, 25.0% in the age range 36-40. 12.9% of the respondents are found in the age range of 41-50 years.5.2% in the age range less than 25. Only 3.4% accounted for the age more than 50 years old. This shows that more than 90% of the respondents are below the age range of 40 years.

Education level wise, the majority of the respondents were first degree holders with the percentage of 72.7% whereas 23% of the samples are from employees with educational level of master's degree. 2.9% of the respondents were diploma level employees.

Job position wise, the majorities (83.6%) of the respondents were from non-management employees and 14.7% of the respondents were from the management group. This shows that most of the respondents were staffs that use the ERP in different department.

Gender	Measure	Frequency	Percent
	Male	83	71.6
	Female	31	26.7
Age	< 25	6	5.2
	26 – 35	60	51.7
	36 – 40	29	25
	41 – 50	15	12.9
	>50	4	3.4
Education level	Masters	23	19.8
	Degree	80	69
	Diploma	11	9.5
Job Position	Managerial	17	14.7
	Non Managerial	97	83.6

Table 4.3 Respondents Characteristics

Years of Job experience of respondents that participate in this study is depicted in Figure 4.1

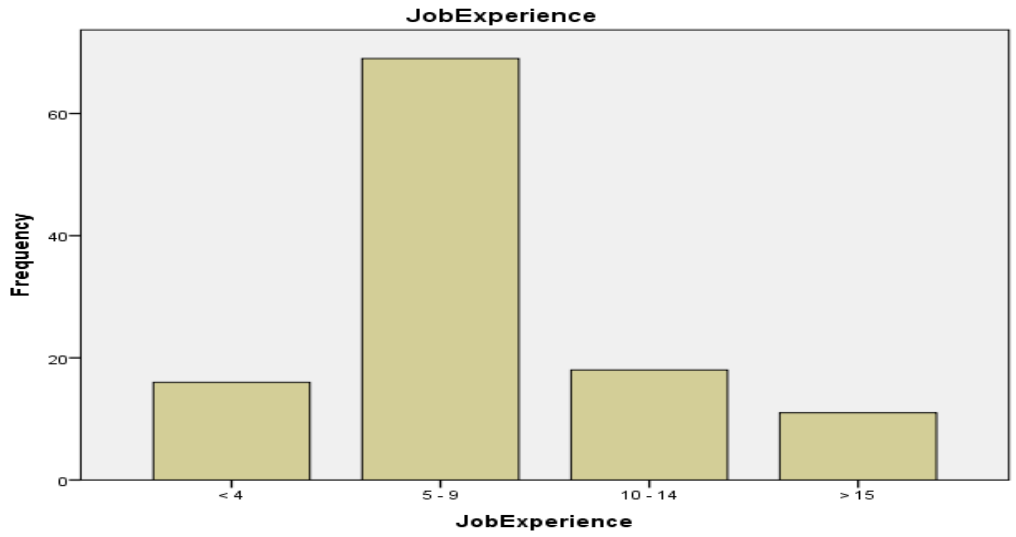

Figure 4.1 Respondents years of experience in the organizations

The job experience of the respondent is included in the questionnaire since it can show how familiar the respondents are with their work operation and how experienced they are with the ERP systems. As it is depicted in figure 4.1, about 60% of the respondents are with 5-9 years of experience.15.5% of the respondents have work experience between 10-to-14 years. Other respondent's accounts 23.3 % of the respondents are with above 15 years and below 4 years of experience. This shows that more than 84.5% of the respondents of this study are above 4 years' experience, which shows further that participants of this study are experienced employees.

Respondents are also categorized by their level of education in to 2nd degree, 1st degree, and diploma holders. Figure 4.2 shows the details about the respondent's level of education.

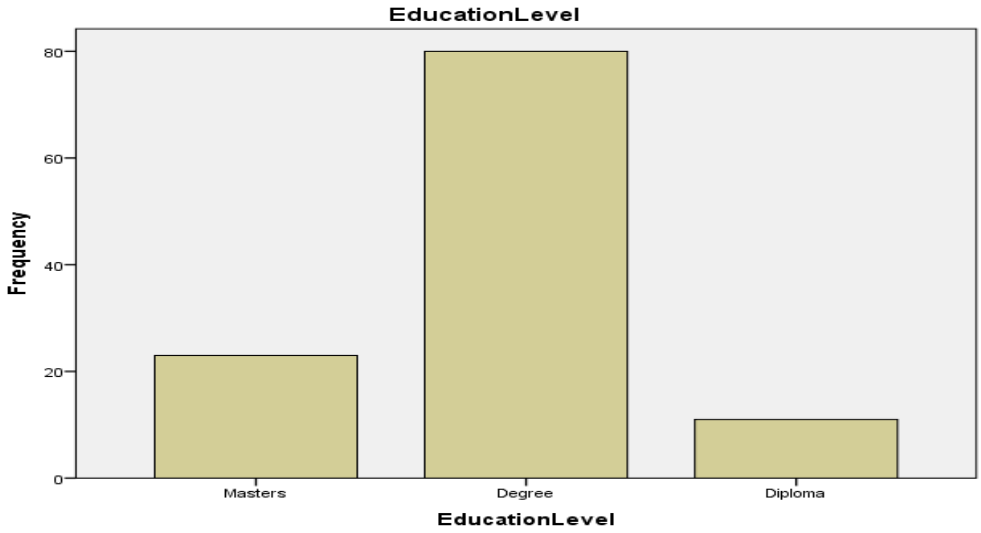

Figure 4.2 Respondents by their level of Education

As it is depicted in, figure 4.2 the distribution of respondents by the level of education showed that 88.8% of the respondents are first-degree and master's degree holders. Only 9.5% of respondents are diploma holders. This shows that the majority of the staffs of the organization participated in this study are first- degree and master's degree holders.

4.3 Presentation of Variables

Even though every respondent, before answering the detail questions, had to select their specific subsystem, the motivation of this research was not demonstrate the challenges and benefits each

subsystem independently, rather the researcher here have explained what benefits and challenges have been observed because of these sub-systems after their synergy.

The descriptive statistics of the mean scores and standard deviation of 27 attributes is discussed in the subsequent five tables in each category (Variable). Human-factor challenges, non- human factor challenges, transactional benefits, traditional benefits and transformational benefits are the list of the variables. The interpretation was made based on the following measurement scale intervals or range. Mean scores 1.00 – 1.80 strongly disagree, 1.81- 2.60 disagree, 2.61 – 3.40 neutral, 3.41- 4.20 agree and 4.21 – 5.00 strongly agree (see page 38)

4.3.1 Human Factor Challenges

The respondent's overall mean rating regarding human-factor challenges was 2.68 implies that human factor challenges were moderate. And standard deviation lies between 1.0 and 1.2. Respondent's answers shows that employee's resistance, lack of commitment from employees to use the system and perception about ERP were not the challenge since all the values of attributes lies between 1.81 and 2.60. All the other challenges under this category were moderate. This response clearly indicates that, the companies were not challenged because of human factor challenges.

Table 4.4: Human- factor challenges

NO	Items	SD	D	N	A	SA	Mean	Std. dev
		No.	No.	No.	No.	No.		
		%	%	%	%	%		
1	Inadequate employee skill in using IT	9 7.9	47 41.2	19 16.7	34 29.8	5 4.4	2.82	1.09
2	Employees resistance	15 13.2	44 38.6	25 21.9	25 21.9	5 4.4	2.66	1.11
3	Lack of commitment from top management at designing and implementation stage	14 12.3	55 48.2	25 21.9	13 11.4	6 5.3	2.52	1.11

4	Lack of commitment from employees to use the system	19 16.7	52 45.6	18 15.8	22 19.3	3 2.6	2.45	1.07
5	Inadequate involvement of employees at the time of designing and implementing the system	11 9.6	32 28.1	21 18.4	43 37.7	7 6.1	3.02	1.14
6	ERP system is not perceived as an advantage	22 19.3	60 52.6	13 11.4	15 13.2	4 3.5	2.29	1.04
7	Lack of commitment and dedication of project team members at design and implementation stage	23 20.175	46 40.351	26 22.807	15 13.158	4 3.5088	2.39	1.06
8	Lack of communication and training to the users of ERP	6 5.2632	31 27.193	13 11.404	48 42.105	16 14.035	3.32	1.17

4.3.2 Non-Human Factor Challenges

In the table 4.5 below, the respondents overall mean rating was 2.71 implies that Non- human factor challenges were moderate. And standard deviation lies between 0.9 and 1.1. Respondent's answers shows that network problem and limited understanding of the benefits and cost of ERP were challenges. On the other hand, complexity of the system was not taken as a challenge. And all the other items under this variable were moderate. This response clearly indicates that because of network problem and limited understanding of benefits and challenges were the main challenges that hindered these public organizations to obtain the benefit as expected.

NO	Items	SD	D	N	A	SA	Mean	Std. dev
		No.	No.	No.	No.	No.		
		%	%	%	%	%		
1	Too complex and make the work difficult	26 22.8	57 50.0	12 10.5	16 14.0	3 2.6	2.23	1.04
2	Inadequate support from vendors	10	49	21	27	7	2.75	1.10

3	Inadequate budget in designing and implementing the system	8.8	43.0	18.4	23.7	6.1		
4	A lot of paper work	7 6.1	57 50.0	17 14.9	27 23.7	6 5.3	2.72	1.06
5	Limited understanding of the benefits and cost of ERP	14 12.3	37 32.5	20 17.5	37 32.5	6 5.3	2.86	1.16
6	Network problem prohibited to use and fully benefited from the system	1 0.9	38 33.3	9 7.9	48 42.1	18 15.8	3.39	1.13
7	Poor ICT Infrastructure	19 16.7	53 46.5	18 15.8	20 17.5	4 3.5	2.45	1.07
8	Keeping data protected all time from being accessed by unauthorized persons makes ERP system practice ineffective	7 6.1	45 39.5	29 25.4	22 19.3	11 9.6	2.87	1.10

Table 4.5:Non-human factor challenges

4.3.3 Transactional benefits

In the table 4.6 above, their respondents overall mean rating was 3.88 implies that transactional benefits were obtained benefit or in good position. And standard deviation lies between 0.8 and 1.0. Respondent's answers shows that all listed items under transactional benefits were entertained benefit especially providing timely information to line managers was highly entertained benefit from the list. Overall, respondents had very good view about transactional benefits. This response Cleary indicates that because of implementing ERP the companies have obtained almost all transactional benefit. But as the figure indicates it is not by full amount.

NO	Items	SD No. %	D No. %	N No. %	A No. %	SA No. %	Mean	Std. dev
1	Using ERP system enhanced the effectiveness the work	1 0.9	5 4.4	16 14.0	60 52.6	32 28.1	4.03	0.83

2	Provide more timely information to line managers	2	6	21	60	25	4.13	0.87
		1.8	5.3	18.4	52.6	21.9		
3	Provide accurate information to employees/line managers	2	10	23	62	17	3.7	0.89
		1.8	8.8	20.2	54.4	14.9		
4	Decreased the time spent on inputting data, communicating information, and processing paperwork	4	5	17	65	23	3.86	0.91
		3.5	4.4	14.9	57.0	20.2		
5	Increased security concerns	1.0	7.0	39.0	46.0	21.0	3.7	0.87
		0.9	6.1	34.2	40.4	18.4		

Table 4.6: Transactional benefits

4.3.4 Traditional benefits

As shown in the table 4.7 below, the respondents overall mean rating was 3.35 implies that traditional benefits were obtained benefit or in good position. And standard deviation lies between 0.7 and 0.9. Respondent's answers shows that except better utilization of training, all listed items were entertained benefit. Overall, respondents had good view about transactional benefits. This response clearly indicates that because of implementing ERP the companies obtained many traditional benefits. But as the figure indicates it was not by full amount and training utilization is at moderate level.

NO	Items	SD No. %	D No. %	N No. %	A No. %	SA No. %	Mean	Std. dev
1	Addresses the complexities associated with the corresponding department	0	9	42	53	10	3.56	0.76
		0.0	7.9	36.8	46.5	8.8		
2	ERP Training and Development is better utilized and meet expectation	7	22	38	43	4	3.13	0.97
		6.1	19.3	33.3	37.7	3.5		

Table 4.7: Traditional benefits

4.3.5 Transformational Benefits

The respondents overall mean rating was 3.76 implies that transformational benefits were Obtained benefit or in good position. And standard deviation lies between 0.7 and 0.8. Respondent's answers shows that all listed items were entertained benefit. Overall, respondents had very good view about transformational benefits. This response clearly indicates that because of implementing ERP the company obtained many transformational benefits. But as the figure indicates it was not by full amount and adding value to the companies because of implementing the system were relatively higher than other items.

NO	Items	SD No. %	D No. %	N No. %	A No. %	SA No. %	Mean	Std. dev
1	Identifies areas that need improvement	1 0.9	9 7.9	30 26.3	61 53.5	13 11.4	3.67	0.82
2	Added value to the company	1 .9	2 1.8	17 14.9	68 59.6	26 22.8	4.02	0.73
3	Improved the strategic decision making of top administrators	1 .9	7 6.1	40 35.1	53 46.5	13 11.4	3.61	0.80

Table 4.8: Transformational benefits

4.3.6 Expectation

As figure 4.3 below shows that 60.5 % of the respondents believed that implemented system met what they expect. On the other hand the remaining 39.5% didn't believe that the system met their expectation.

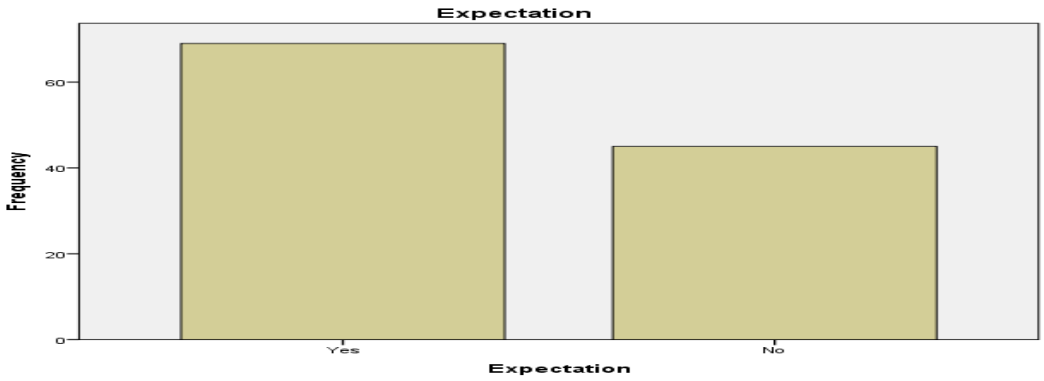

Figure 4.3 Expectation's responses

4.4 Interview Results

In addition to the quantitative study, qualitative data analysis is conducted to analyze the benefit and challenge in the ERP implementation. Also the interview used helped as a supplement and to enrich the findings obtained from the survey. The following discussions are therefore presented by compiling interview results

Table 4.9 the characteristics of the three public organizations

Companies' Information		**Interviewee's Information**	
Industry	**Size**	**Job Position**	**Educational Background**
Telecommunication	Relatively Larger	ERP Phase II Project Manager	Leadership and management
Financial Sector	Relatively Larger	IFMIS Deployment Head	Management
Water Works development	Relatively Smaller	IT Department Head	IT

4.4.1 Benefits of Implementing ERP

The data presented from Table 4.4 to 4.8 shows that all the three organizations enjoyed many benefits as a result of implementing ERP and as all participants of the interview confirm that the future benefit will be greater than the past and current benefits. Both enjoyed actual benefits and potential benefits presented below by Transactional benefit, Traditional benefit and transformational benefit category.

As it has been proofed from the collected evidences and witnessed from other researches. The **transactional benefit** is first stage benefit any company enjoyed when implementing any system. The extent may vary from company to company, system to system or some other issues but transactional benefits are highly enjoyed benefits. The aggregate mean of the transactional benefit was 3.88. It indicates that most of the respondents nearly agree that the companies will

attain a transactional benefit. As a company it shows that they are on the right track and started to enjoy the benefit.

At MoFEC it was indicated that they don‘t have all transactional benefits, they replied that the main problem is data accuracy and they are working on it as special initiative to settle the problem. According to the response, it was very difficult to list all the challenges for not enjoying all the benefit but what they knew was that the problem was not raised due to the system because the system performance was checked starting from project time and after go-live also (it is observed on the companies dash board also). What the researcher observed from the discussion during the interview was that the top management commitments for budget was highly appreciated but assigning dedicated team to design, implement, and communicate to the users of the system and following the progress was not good.

In relation to this the other issue mentioned from ethio-telecom and MoFEC above was the complexity of measuring whether the implemented ERP system was giving the planned benefit or not. After the system go live the companies enjoyed the benefit and will enjoy additional benefit after settling the current data accuracy problem but they was not sure the exact deadline to realize the initiative. Therefore if the companies calculate cost/benefit analysis the cost may be greater than the benefit or vice versa.

In the latter case also they can make a difference on the amount of transactional benefit. The researcher recommends, putting time frame to measure the benefit in various periods in addition to performance and cost. But still in ethio-telecom and MoFEC they didn’t know the exact benefit achieved because of implementing the ERP system. The benefit was not yet measured. Therefore if this benefit continues unmeasured in the future, it will be difficult for them to manage it.

The second category is **traditional benefit**. This benefit is obtained when automating existing process of the company. From ethio-telecom, finance, HR & payroll, supply chain and project management departments, from WWDSE HR, finance, Record and Archive, fleet and maintenance business unit and IT divisions and from MoFEC HR, budget ,treasury, finance,

inspection, internal audit, information system, general service and macro departments with regard to their respective purpose were using the system. But based on their responsibility the privilege to use the sub-system is different. All participants before filling the questionnaire select the sub-system they use. Selecting the sub-system increase the accuracy of the information they provide because they were asked about what module they used currently. In addition to this all department heads was interviewed. Therefore obtained data was discussed below.

When we take MoFEC, all the department heads agreed that they are not fully enjoying the traditional benefits as they expect from the system. They basically suggest two reasons for this partial benefit. The first one was data inaccuracy and the other one was that the system implementation is limited. Therefore, the current was more of supporting the existing process not replacing the existing process. Based on the interview evidence, even though the implemented ERP had different sub-system all were integrated. Therefore data inaccuracy was applied in all sub-systems. Based on the researcher‘s observation the organization was still using the existing paper work and system together. One of interviewed manager revealed that they are spending more time on paper works.

The other point regarding **traditional benefit** was alignment issue with the three public organizations. When the companies implement the ERP system, utilizing the system feature is not enough. They should rather need to check whether it was aligned with the company’s strategic focus or not. As the interview results shown, when they implement ERP, they didn‘t check alignment but it had good feature i.e. based on the requirement customization and work around is possible. Since both standard and customization has their own advantage and disadvantage. But some of customization can be settled before go live but because team members were busy by other commitment can‘t do that as one of the interviewed officers of organization’s had said. Because of late reaction the companies incurs additional cost for support team and don‘t enjoy the benefit at the right time.

The last benefit is **Transformational benefit**. It means in the process of transformation what is the contribution of ERP. Any system, including ERP, can‘t replace humans rather it supports human being by providing accurate information for decision. Especially for this type of benefit

the people who use the system matters most. As many researches support it is very difficult to measure direct transformation benefit because of adopting the system we can estimate it indirectly.

In contrary to the questionnaire result for the aggregate mean of transformational benefit of **3.76** that was under the range of agreed, the evidence from interview also shows that the company is on the way to be strategic and they are hoping that the system will support their work in the future but still not yet enjoyed it fully. (*WWDSE*).

And what they add was their employees had enjoyed the system by comparing it with the previous purely traditional work but the actual result was not that.

> "*The transformational benefit can come because of the system but not immediately. Because the different departments that implement ERP activities should became first strategic before supported by the system. But the problem faced on transactional and traditional part affect this benefit. Almost all employees are still focusing on daily routine tasks therefore at this stage it is very difficult to enjoy and measure transformational benefit*." *(WWDSE).*

Based on the above evidence the public companies have benefited because of implementing ERP. The question that still remains was whether the benefited was as expected or not. Even though it was in a varying amount and clarity but still the companies were enjoying all types of benefit.

4.4.2 Challenges of Implementing ERP

When companies bring change, to adopt it to their respective, a challenge is expected; the challenge type may depend on the change. Especially when the change affects many people's work, the amount of the challenge may also increase. For our discussion purpose the researcher categorizes the challenges in to two: Human factor challenges and non-human factor challenges.

Human factor challenges are challenges that arise from the people (user). During implementation process of ERP people participated with varying responsibility. All participating people don't always agree each other based on the logic they raised at that time. Since all changes are not important to the company the companies have to have the room to entertain the

challenge because it may add value even for change. Based on the evidence collected from the interview and the questionnaire, ethio-telecom, MoFEC and WWDSE had faced different human-factor challenges.

Inadequate employee skill in using IT, Inadequate involvement of employees at the time of designing and implementing the system, Exclusion of key people during design and implementation stage and Lack of communication and training to the users of ERP take the highest share of lists mentioned as challenges.

Even though the aggregate mean was under the range of neutral, most of highest shared items are supported by interview evidence and company's dash board report under the challenge category. This shows that for skill and communication problem project management and the different department managers may take responsibility. For the other two even though the problem was on designing and implementing process top management had to take responsibility because they related assigning competent workforce by adequate amount for the processes.

But when we look at ethio-telecom, top management commitment to invest on it was highly appreciated. On the other hand based on the evidence collected from interview lack of skills of users was not because of lack of training rather the people prefer traditional method so didn't exercise as expected. Therefore, the issue was not only related to skill issue rather at the back behavioral factors can also be included.

In ethio-telecom and MoFEC, they had added that system training that was conducted for all users by experienced trainers that require continues exercise but the employees are not committed in that aspect also. What the researcher observed was because of data inaccuracy problem all employees didn't enjoy the system that was why 39.5% didn't believe that the system met their expectation. Therefore, the companies have to communicate continually to improve the ability and motivate the employees in adopting the change and fully benefit from the system.

Concerning the lesson's they learnt during the adoption of ERP, ERP Phase II project manager of ethio-telcom mentioned that after implementing the phase one project of Oracle ERP, the company had learnt the strengths and weaknesses during the implementation and the problem they faced on first phase and what corrective action they had to take for the second phase, on the other side in WWDSE, the directors admitted that though there were lessons learned during the ERP implementation but still they believe they are on adopting the new ERP system since most of the workers are using both the legacy and the new system.

One of the major observed challenges at WWDSE under human factor challenge was human error during inputting the information to the system and the main reason for the problem was many of the employees that was using the system were untrained workers who had less exposure to the system and to the new style of working, shifts to avoiding or not accepting the new system, finding faults in the system, showing resistance towards learning and finally creating gap and exit. Timely training and attitude shift, pro system advice, gives the work force some learning and better acceptance.

Non-human factor challenges are challenges appeared during implementing the system but their source is not from human being directly. The source can be internal or external, it can be the system itself or it can be the process of implementing system. Table 4.5 above shows that the aggregate mean of non-human factor challenges is 2.71. It is under the range of neutral. And from that four of the attributes take the highest share even though the aggregate mean was under neutral range. They were the network problem prohibited to use and fully benefited from the system, limited understanding of the benefits and cost of ERP, poor ICT infrastructure and Inadequate support from vendors. From the list one is external to the company and the others are internal problem.

One of interviewed manager from the second public organization said that they were still dependent on vendors for support. Therefore, the company was incurring additional costs after go live also. And he added as a company they were not ready to receive all the knowledge they had.

4.4.3 Consequence of continuing existing practice

The existing practice in the organizations was discussed above. That means both benefits and challenges and strength and weaknesses. The companies had to keep their strength‘s and solve the problem quickly. Showing and estimating the consequence was not just for estimation purpose rather to prepare today for tomorrow.

One issue was measuring the performance of ERP issue. The benefit should not be perceptions of system administrators and top management of employees. The scope of this thesis was not to measure benefits but what the researcher recommended was that they had to prepare clear measurement parameters. The other serious issue that may affect implementing the system was data accuracy. If the companies are not ready practically to solve with the data accuracy problem quickly, not only will they enjoy the benefits rather the system will be source of the problem.

4.5 Summary

Providing timely information to line managers and adding value to the companies because of implementing the system were the main benefits gained due to implementation of ERP whereas Network problem and limited understanding of the benefits and cost of ERP were the main challenges stated by the respondents.

The results concerning the impact of ERP in a public sector setting are encouraging, but mixed. The managements overall are satisfied with the system, but don’t yet see many benefits from its usage outside of its effect on information and information sharing. Part of the problem may stem from the type of organizations that were sampled. As a large majority of the directors believed that the ERP system was not being fully utilized.

CHAPTER-FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

This chapter presents summary, conclusions and recommendations arising out of the research findings and also suggests areas for further study.

5.1 Summary of Findings

- ✓ Employee's resistance, lack of commitment from employees to use the system and perception about ERP were not the challenge (s) under the categories of human factor challenges. This response clearly indicates the companies was not challenged because of human factor challenges (see table 4.4)

- ✓ Network problem and limited understanding of the benefits & cost of the ERP system in the three public organizations were challenges of non-human factor challenges. On the other hand, complexities of the system was as one of the challenge in WWDSE where as in Ethio telecom and MoFEC that were not as one of the challenges (see Table 4.5)

- ✓ All listed items under transactional benefits (see table 4.6) were entertained benefits. Especially, providing timely information to line managers was highly entertained benefit from the list. Overall, respondents had a very good view about transactional benefits. This response clearly indicates that because of implementing an ERP system the companies obtained almost all transactional benefits. But as the figure in table 4.6 indicates; it is not by full amount. Based on the information obtained from the interview, the main reasons of not obtaining the full amount of the transactional benefits are data inaccuracy problem and top management commitment in follow-ups.

- ✓ All listed items under traditional benefits (see table 4.7) were entertained benefits except better utilization of training and development sub-system .overall, respondents had good

view about traditional benefits. This response clearly indicates that because of its implementation of the ERP, the companies have obtained many traditional benefits. But as the figure in the table 4.7 indicates except training about the system, the benefits are not by full amount. Regarding training the benefits are at moderate level.

- ✓ All listed items under transformational benefits (see table 4.8) were entertained benefits. Overall, respondents had very good view about transformational benefits. This response clearly indicates that because of implementing ERP, the public organizations have obtained many transformational benefits. But as the figure indicates (see table 4.8), it was not by full amount.' The information generated from our ERP system has added value to the companies' on the section of 'benefits of implementing /practicing ERP' has a higher benefit than other transformational benefits. On the other hand the interview result shows transformational benefit was at infant stage.

5.2 Conclusions

The gender balance is inclined towards male employees. And People skill and attitude is one of the major success factors to adopt ERP system successfully. In this regard the public companies under study has challenged by inadequate employee skill in using IT because of lack to training and attitude problem. This lead not only to get full benefit from the system rather it leads to made repetitive human mistakes. All the public companies didn't know the exact benefit enjoyed because of implementing the ERP, and in addition they didn't have the exact measurement tool for it.

5.3 Recommendations

- ✓ To minimize the impact from human-factor challenges, the companies have to deliver continuous on- the job and off-the job trainings based on the competency gap of employees who use the system. In addition to that, the advantage of using the system should be communicated as well. And, it is better to have standby experts who can support users of the system. These standby experts have to be nominated from the project

team members who have been participating on the system design and deployment phase; but a proactive mechanism should be there to retain these experts and finally it is better to have practical monitoring mechanism as well so that accountability & encouragement of committed users exists.

- ✓ To minimize the impact from non-human factor challenges the companies have to deploy adequate resource to use the system without interruption and to balance between customization and standard since both options has their own advantages and disadvantages. Plus it's better to work more on knowledge transfer from integrators and vendors to internal assets (human resource, finance and other departments) of the companies.

- ✓ The companies have to celebrate enjoyed transactional benefits from the system and top management has to continually follow, monitor and evaluate to minimize data inaccuracy problem, and its recommended to check whether the system is user-friendly or not to users and make possible adjustments accordingly.

- ✓ To increase traditional benefits, the companies has to assess in detail which business function of the division integrated in the system and which is not, and according to the result they have to make necessary decision to customize and use the standard feature. Otherwise some activities will be handled through system interface and the other will require manual intervention and this will lead to inefficiency.

- ✓ Finally, the managers need to examine whether the integrators are doing what is expected from them based on the contract. As a newly introduced IT technology the companies have to focus on the knowledge transfer of its employee from the integrators, otherwise the integrators will not worry about this knowledge transfer since their vested interest is to stay on the companies as a post-implementation support and get lots of foreign exchange from the companies and the country as well. So by defining some parameters the companies need to check how far the knowledge transfer has been achieved.

5.4 Directions for Further Research

As with all research, this study also has certain limitations. Some of them are:

- ✓ First, the study was carried out using a particular type of technological innovation which is ERP system. As such, the research needs to be replicated to examine the robustness of the findings across a wider range of technological solutions and samples.

- ✓ In this study, sample was limited to three governmental organizations. Future research can involve a larger number of organizations which are governmental and non-governmental and more participants per organizations. Doing so, can better represent trends within each sector and allow for more reliable comparisons.

- ✓ Other limitation is the static nature of the study, that is, the study is based on the existing scenario of the level and usage of ERP; but the ERP system can be enhanced in future. Therefore research should be conducted in future to know whether ERP in the three public organizations is improving with changing time or not within the companies.

- ✓ The research study was restricted to total of 114 respondents. Therefore, a detailed research would be needed to explore the functions and contributions of ERP to, especially with much; bigger sample size and a higher response rate so that a deeper analysis can be done for generalization.

- ✓ Finally, there are some possibilities of measurement errors. The study focused on perception of the respondents and instrument relied on self-reports and perceptions of the respondents alone. This could have resulted in some degree of perceptual inflation of self-assessment scores. Those who enjoyed great satisfaction with new technology may have inflated their response with respect to their intention to continue to use the system.

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APPENDICES

Appendix-A

Addis Ababa University

School of Information Science

Master of Science in Information Science

Dear Respondent,

This is a research on the topic "**The benefits and challenges of implementing ERP: the case of public sectors in Ethiopia** ". The research is carried out in order to fulfill the requirement of graduate studies of Addis Ababa University, as the final year thesis for masters in Information science. You have been selected as a respondent to this questionnaire because I believe the information that you will provide will be very useful to realize the objective of the study.

The information you avail in this questionnaire will be used for strictly academic purposes and confidentiality will be ensured. You don't need to write your name on it and nobody will ask you what and why you write. Please try to answer all of the questions and complete the questionnaire and don't leave any out.

Contact Address:

Muzit Desta
Tel: 251912104058
Email: muzit_d2006@yahoo.com

Thank You Very Much!

FOR WWDSE

Part I: Demographical Information -> Please put **'X'** in the given answer box

1. Gender Male ☐ Female ☐

2. Age Group

A. ≤ 25 ☐ B. 26 – 35 ☐

C. 36 – 40 ☐ D. 41 – 50 ☐ E. Above 50 ☐

3. Educational Status

A. Below Diploma ☐ B. Diploma ☐

C. BA/BSC ☐ D. Masters & Above ☐

Other please specify _____

4. How long have you been working in the WWDSE?

A.≤ 4 ☐ B. 5 – 9 ☐ C. 10 – 14 ☐ D.14 and above ☐

5. The position you hold in the organization

A. Staff ☐ B. Supervisor ☐ C. Manager ☐

D. Officer ☐ E. Expert ☐

Part II

Please put a tick () mark on the following Cyber-ERP sub-systems list **that you currently use**. If you use more than one sub-system you can mark more than one.

Sub-Module list

☐ Integrated Finance Management system

☐ Human Resource Management system

☐ Record Management Information System

☐ Transport Fleet Management System

☐ Purchasing and Supply Management System

☐ Payroll Management System

☐ CORE

☐ System Resource Management System

Other please specify _____

Please circle your choice of the numbers below. The numbers are defined with their respective equivalent meaning as follows;

1= Strongly Disagree (**SD**)

2 = Disagree (**D**)

3 = Neutral (**N**)

4= Agree (**A**)

5 = Strongly Agree (**SA**)

Section 1: **Benefits of Implementing/Practicing Cyber-ERP**

FACTORS	**Scale**				
	SD	**D**	**N**	**A**	**SA**
1.Using Cyber-ERP has enhanced the effectiveness of my work	1	2	3	4	5
2. Helped me to provide more timely information to line managers	1	2	3	4	5

	SD	D	N	A	SA
3. Enables me to provide accurate information to employee/line managers	1	2	3	4	5
4.Our Cyber-ERP system has decreased the time spent on inputting data, communicating information, and processing paper work	1	2	3	4	5
5.Our Cyber-ERP system has increased security concerns	1	2	3	4	5
6. Addresses the complexities associated with your corresponding department	1	2	3	4	5
7. Identifies areas that need improvement from your respective sub-system	1	2	3	4	5
8. The information generated from our cyber-ERP system has added value to the company.	1	2	3	4	5
9.The information generated from our cyber-ERP system has improved the strategic decision making of top administrators	1	2	3	4	5
10. Cyber-ERP training and development is better utilized and meet our expectation	1	2	3	4	5

Section 2: Challenges of Implementing/Practicing cyber-ERP

FACTORS	Scale				
	SD	D	N	A	SA
11.The cyber-ERP of the company is too complex and make the work difficult	1	2	3	4	5
12. Employees lack adequate skill in using IT	1	2	3	4	5
13. We didn't have adequate support from vendors	1	2	3	4	5
14. my organization have faced resistance from employees because they prefer traditional methods	1	2	3	4	5
15. Inadequate budget during designing and implementing the system	1	2	3	4	5
16. My organization's has faced a lot of paper work that is difficult to computerize	1	2	3	4	5
17. The cyber-ERP was not having commitment from top management at design and implementation stage	1	2	3	4	5

	SD	D	N	A	SA
18. Employee do not have the commitment to use the system	1	2	3	4	5
19. Inadequate involvement of employees at the time of designing and implementing the system.	1	2	3	4	5
20. Cyber-ERP system is not perceived as an advantage	1	2	3	4	5
21.Lack of commitment and dedication of project team members during design and implementation stage	1	2	3	4	5
22.Network problem to use and fully benefit from the system	1	2	3	4	5
23. Our organization have poor ICT infrastructure which result in ineffective Cyber-ERP implementation	1	2	3	4	5
24.Limited understanding of benefits and cost of Cyber-ERP	1	2	3	4	5
25.keeping data protected all time from being accessed by unauthorized persons makes Cyber-ERP practice ineffective	1	2	3	4	5
26.Lack of communication and training to the users about cyber-ERP system	1	2	3	4	5

27. Our Cyber-ERP system has met our expectations Yes ☐ NO ☐

Part III

1. Do you think implementing cyber-ERP systems contribute to the success of your corresponding division?
   How_____
   _____
   _____
   _____
   _____
   _____
   _____
   _____

2. From your experience what do you suggest, to increase the effectiveness of cyber-ERP system of the company and points to be improved?_____
   _____
   _____

_____
_____
_____
_____

3. If there is any other issue that you observed in relation to the benefits and challenges of implementing cyber-ERP ,please write down here_____
_____
_____
_____
_____
_____
_____

FOR ETHIO-TELECOM

Part I: Demographical Information -> Please put 'X' in the given answer box

1. Gender Male ☐ Female ☐

2. Age Group

A. ≤ 25 ☐ B. 26 – 35 ☐

C. 36 – 40 ☐ D. 41 – 50 ☐ E. Above 50 ☐

3. Educational Status:

A. Below Diploma ☐ B. Diploma ☐

C. BA/BSC ☐ D. Masters & Above ☐

Other please specify _____

4. How long have you been working in the WWDSE?

A.≤ 4 ☐ B. 5 – 9 ☐ C. 10 – 14 ☐ D.14 and above ☐

5. The position you hold in the organization

A. Staff ☐ B. Supervisor ☐ C. Manager ☐

D. Officer ☐ E. Expert ☐

Part II

Please put a tick () mark on the following ERP sub-systems list that you currently use. If you use more than one sub-system you can mark more than one.

Sub-Module list

☐ General Ledger ☐ Project Management

☐ Accounts Payable

☐ Fixed assets

☐ Accounts Receivables

☐ Cash Management

☐ Payroll

☐ Purchasing

☐ Order Inventory

☐ Order Management

☐ Sourcing

☐ Procurement

☐ Mobile Supply Chain

☐ I-supplier

☐ Procurement Contracts

☐ Project Costing

☐ I-expense

☐ Enterprise asset Management

☐ SSHR

☐ Field Service

☐ OTL

☐ Performance Management

☐ I-Recruitment

☐ Learning Management

☐ Succession Planning

☐ Incentive Compensation

Other please specify _____

Please circle your choice of the numbers below. The numbers are defined with their respective equivalent meaning as follows;

1= Strongly Disagree (SD)

2 = Disagree (D)

3 = Neutral (N)

4= Agree (A)

5 = Strongly Agree (SA)

Section 1: Benefits of Implementing/Practicing ERP

FACTORS	Scale				
	SD	**D**	**N**	**A**	**SA**
1.Using ERP has enhanced the enhanced the effectiveness of my work	1	2	3	4	5
2. Helped me to provide more timely information to line managers	1	2	3	4	5
3. Enables me to provide accurate information to employee/line managers	1	2	3	4	5
4.Our ERP system has decreased the time spent on inputting data, communicating information, and processing paper work	1	2	3	4	5
5.Our ERP system has increased security concerns	1	2	3	4	5
6. Addresses the complexities associated with people management	1	2	3	4	5
7. Identifies areas that need improvement from your respective sub-system	1	2	3	4	5
8. The information generated from our ERP system has added value to the company.	1	2	3	4	5
9.The information generated from our ERP system has improved the strategic decision making of top administrators	1	2	3	4	5
10.ERP training and development is better utilized and meet our expectation	1	2	3	4	5

Section 2: Challenges of Implementing/Practicing ERP

FACTORS	Scale				
	SD	**D**	**N**	**A**	**SA**
11.The ERP of the company is too complex and make the work difficult	1	2	3	4	5
12. Employees lack adequate skill in using IT	1	2	3	4	5
13. We didn't have adequate support from vendors	1	2	3	4	5
14. My organization have faced resistance from employees because they prefer traditional methods	1	2	3	4	5
15. Inadequate budget during designing and implementing the system	1	2	3	4	5
16. My organization's has faced a lot of paper work that is difficult to computerized	1	2	3	4	5
17. The ERP was not having commitment from top management at design and implementation stage	1	2	3	4	5

	SD	D	N	A	SA
18. Employees do not have the commitment to use the system	1	2	3	4	5
19. Inadequate involvement of employees at the time of designing and implementing the system.	1	2	3	4	5
20. ERP system is not perceived as an advantage	1	2	3	4	5
21. Lack of commitment and dedication of project team members during design and implementation stage	1	2	3	4	5
22. Network problem to use and fully benefit from the system	1	2	3	4	5
23. Our organization have poor ICT infrastructure which result in ineffective ERP implementation	1	2	3	4	5
24. Limited understanding of benefits and cost of ERP	1	2	3	4	5
25. keeping data protected all time from being accessed by unauthorized persons makes ERP practice ineffective	1	2	3	4	5
26. Lack of communication and training to the users about ERP system	1	2	3	4	5

27. Our ERP system has met our expectations Yes ☐ NO ☐

Part III

1. Do you think implementing ERP systems contribute to the success of your corresponding division?
   How_____
   _____
   _____
   _____
   _____
   _____
   _____
   _____
2. From your experience what do you suggest, to increase the effectiveness of ERP system of the company and points to be improved?_____
   _____
   _____

_____
_____
_____
_____

3. If there is any other issue that you observed in relation to the benefits and challenges of implementing ERP ,please write down here_____
_____
_____
_____

FOR MoFEC

Part I: Demographical Information -> Please put **'X'** in the given answer box

1. Gender Male ☐ Female ☐

2. Age Group

A. ≤ 25 ☐ B. 26 – 35 ☐

C. 36 – 40 ☐ D. 41 – 50 ☐ E. Above 50 ☐

3. Educational Status:

A. Below Diploma ☐ B. Diploma ☐

C. BA/BSC ☐ D. Masters & Above ☐

Other please specify _____

4. How long have you been working in the MoFEC?

A.≤ 4 ☐ B. 5 – 9 ☐ C. 10 – 14 ☐ D.14 and above ☐

5. The position you hold in the organization

A. Staff ☐ B. Supervisor ☐ C. Manager ☐

D. Officer ☐ E. Expert ☐

Part II

Please put a tick () mark on the following IFMIS sub-systems list **that you currently use**. If you use more than one sub-system you can mark more than one.

Sub-Module list

☐ Fixed Asset

☐ Inventory

☐ General Ledger

☐ Account Payable

☐ Procurement

☐ Payroll

☐ Budget

☐ Cash Management

Other please specify _____

Please circle your choice of the numbers below. The numbers are defined with their respective equivalent meaning as follows;

1= Strongly Disagree (**SD**)

2 = Disagree (**D**)

3 = Neutral (**N**)

4= Agree (A)

5 = Strongly Agree (**SA**)

Section 1: **Benefits of Implementing/Practicing IFMIS**

FACTORS	**Scale**				
	SD	**D**	**N**	**A**	**SA**
1.Using IFMIS has enhanced the effectiveness of my work	1	2	3	4	5
2. Helped me to provide more timely information to line managers	1	2	3	4	5
3. Enables me to provide accurate information to employee/line managers	1	2	3	4	5
4.Our IFMIS system has decreased the time spent on inputting data, communicating information, and processing paper work	1	2	3	4	5

	SD	D	N	A	SA
5.Our IFMIS system has increased security concerns	1	2	3	4	5
6. Addresses the complexities associated with finance management	1	2	3	4	5
7. Identifies areas that need improvement from your respective sub-system	1	2	3	4	5
8. The information generated from our IFMIS system has added value to the company.	1	2	3	4	5
9.The information generated from our IFMIS system has improved the strategic decision making of top administrators	1	2	3	4	5
10. IFMIS Training and development is better utilized and meet our expectation	1	2	3	4	5

Section 2: **Challenges of Implementing/Practicing IFMIS**

FACTORS	**Scale**				
	SD	**D**	**N**	**A**	**SA**
11.The IFMIS of the company is too complex and make the work difficult	1	2	3	4	5
12. Employees lack adequate skill in using IT	1	2	3	4	5
13. We didn't have adequate support from vendors	1	2	3	4	5
14. my organization have faced resistance from employees because they prefer traditional methods	1	2	3	4	5
15. Inadequate budget during designing and implementing the system	1	2	3	4	5
16.My organization's has faced a lot of paper work that is difficult to computerized	1	2	3	4	5
17.The IFMIS was not having commitment from top management at design and implementation stage	1	2	3	4	5
18.Employees do not have the commitment to use the system	1	2	3	4	5
19. Inadequate involvement of employees at the time of designing and implementing the system.	1	2	3	4	5
20. IFMIS system is not perceived as an advantage	1	2	3	4	5

	SD	D	N	A	SA
21.Lack of commitment and dedication of project team members during design and implementation stage	1	2	3	4	5
22.Network problem to use and fully benefit from the system	1	2	3	4	5
23. Our organization have poor ICT infrastructure which result in ineffective IFMIS implementation	1	2	3	4	5
24.Limited understanding of benefits and cost of IFMIS	1	2	3	4	5
25.keeping data protected all time from being accessed by unauthorized persons makes IFMIS practice ineffective	1	2	3	4	5
26.Lack of communication and training to the users of IFMIS system	1	2	3	4	5

27. Our IFMIS system has met our expectations Yes ☐ NO ☐

Part III

1. Do you think implementing IFMIS systems contribute to the success of budget division? How_____
   _____
   _____
   _____
   _____
   _____
   _____
2. From your experience what do you suggest, to increase the effectiveness of IFMIS system of the company and points to be improved?_____
   _____
   _____
   _____
3. If there is any other issue that you observed in relation to the benefits and challenges of implementing IFMIS ,please write down here_____
   _____
   _____

Appendix-B

Addis Ababa University

School of Information Science

Master of Science in Information Science

Interview Questions:

1. What is your role in your organization, and your involvement with ERP?
2. What ERP are used in your organization and how are they used?
3. What is your organization's motivation for adopting ERP? And do you think implemented ERP met your expectation?
4. Can you explain the factors that have encouraged or hindered your organization for adopting ERP? What kinds of technological/organizational/environmental problems/issues/challenges were encountered during your organization's adoption of ERP?
5. Can you elaborate on lessons learnt during the adoption of ERP in your organization?
6. Can you explain the implication and/or organizational changes arising from ERP adoption in your organization?
7. What are the future trends of ERP in your organization?
8. Are there any other issues concerning ERP adoption that have not been covered in this interview and that you wish to bring to our attention?
9. Please provide any additional information that you think would be helpful in my analysis?

Appendix-C

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ADDIS ABABA UNIVERSITY
College of Natural Science
School of Information Science

Date December 28, 2015
Ref: -SIS/ 27 /2015

To: Ethio telecom
Addis Ababa

Dear Sir / Madam

Student Muzit Desta (ID. No. GSE/0471/06) is a graduate student at the School of Information Science, Addis Ababa University. She is currently conducting a MSc. thesis research under the title "Challenges & practices of change management in the implementation of ERP the case of public sectors in Ethiopia".

I would like to thank you in advance for all the assistance that you would provide to the students.

With Regards,

Martha Yifiru (PhD)
Head, School of Information Science

✉: 1176 ☎: +251-(11)-122-91-91 ☎:2122- 91-92

አዲስ አበባ ዩኒቨርሲቲ
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ADDIS ABABA UNIVERSITY
College of Natural Science
School of Information Science

Date March 29, 2016
Ref: -SIS/ቤ/2016

To: WWDSE (Water Works design & supervision enterprise)
Addis Ababa

Dear Sir / Madam

Student Muzit Desta (ID. No. GSE/0471/06) is a graduate student at the School of Information Science, Addis Ababa University. She is currently conducting a MSc. thesis research under the title "Challenges and benefit of ERP implementation the case of public sector in Ethiopia".

I would like to thank you in advance for all the assistance that you would provide to the students.

With Regards,

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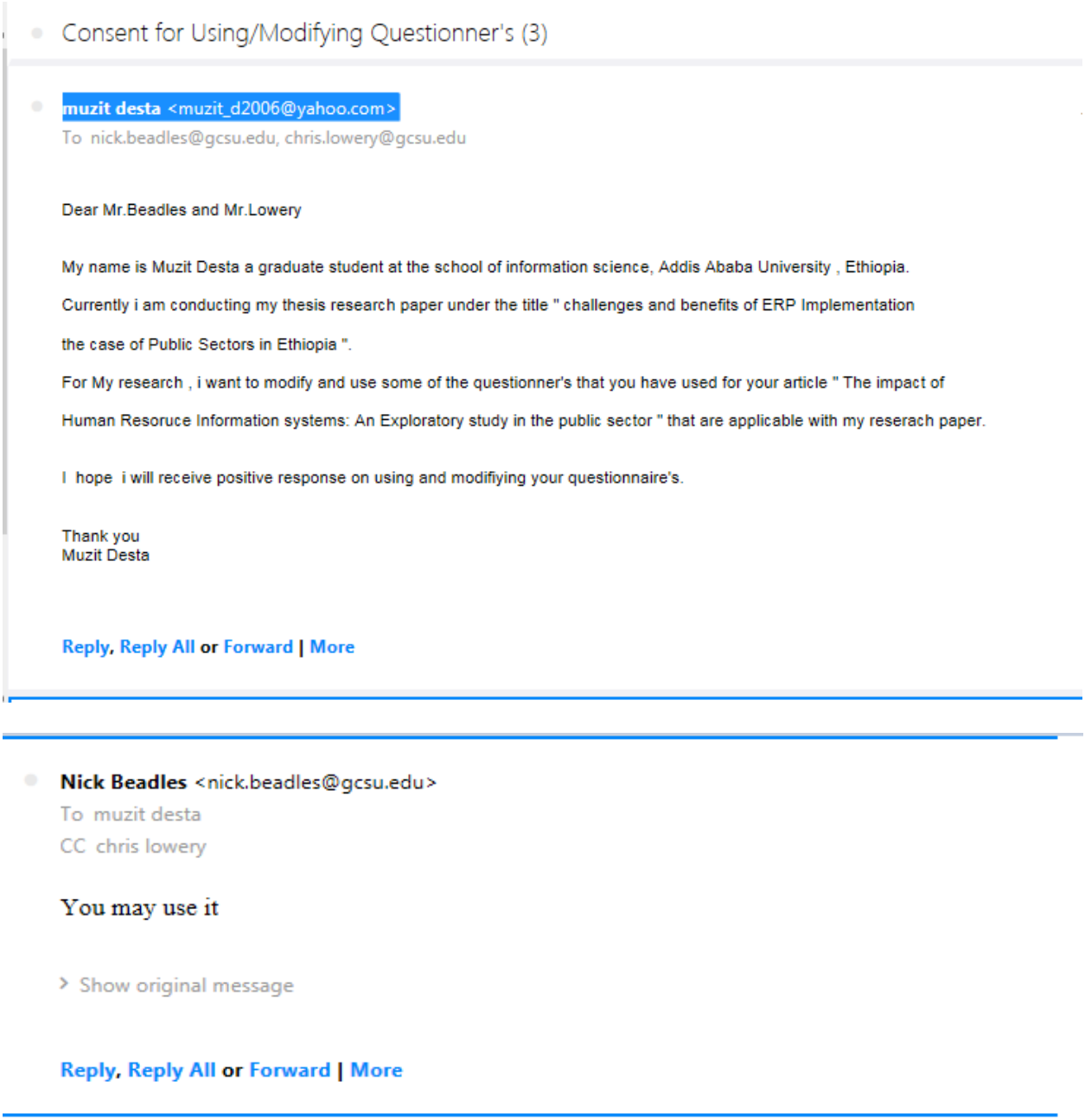
SCHOOL OF INFORMATION SCIENCE
አዲስ አበባ ዩኒቨርሲቲ ADDIS ABABA UNIVERSITY

Martha Yifiru (PhD)
Head, School of Information Science

✉: 1176 ☎: +251-(11)-122-91-91 ☎:2122- 91-92

Appendix-D



Consent for Using/Modifying Questionner's (3)

muzit desta <muzit_d2006@yahoo.com>
To nick.beadles@gcsu.edu, chris.lowery@gcsu.edu

Dear Mr.Beadles and Mr.Lowery

My name is Muzit Desta a graduate student at the school of information science, Addis Ababa University , Ethiopia.

Currently i am conducting my thesis research paper under the title " challenges and benefits of ERP Implementation

the case of Public Sectors in Ethiopia ".

For My research , i want to modify and use some of the questionner's that you have used for your article " The impact of

Human Resoruce Information systems: An Exploratory study in the public sector " that are applicable with my reserach paper.

I hope i will receive positive response on using and modifiying your questionnaire's.

Thank you
Muzit Desta

Reply, Reply All or Forward | More

Nick Beadles <nick.beadles@gcsu.edu>
To muzit desta
CC chris lowery

You may use it

› Show original message

Reply, Reply All or Forward | More

DECLARATION

I declare that the thesis is my original work and has not been presented for a degree in any other University.

_____

June, 2016

This thesis has been submitted for examination with my approval as a university advisor.

_____

Rahel Bekele (PhD)

June, 2016