



**Addis Ababa University
School of Commerce**

**Evaluating ERP Implementation Project: The Case of on ERP
Implementation, at the United Nations Economic Commission for
Africa**

**BY
Fetsum Kurabachew Ayalew**

Advisor: Dr. Temesgen Belayneh (PhD)

**A Thesis Submitted to the School of Graduate Studies of Addis Ababa
University, School of Commerce in Partial Fulfillment of the
Requirements for the Masters in Project Management**

June 2017

Evaluating ERP Implementation Project: The Case of on ERP Implementation, at the United Nations Economic Commission for Africa

BY
Fetsum Kurabachew Ayalew
GSD/0400/06

APPROVED BY

Dr. Temesgen Belayneh

Advisor

Signature and Date

Dr. Mengistu Bogale

Internal Examiner

Signature and Date

Dr. Mohammed A.

External Examiner

Signature and Date

DECLARATION

I, **Fetsum Kurabachew Ayalew**, declare the thesis entitled: Evaluating ERP Implementation Project: The Case of on ERP Implementation, at the United Nations Economic Commission for Africa, is my original work, prepared under the guidance of Dr. Temesgen Belayneh (PhD). All sources of materials used for the thesis have been duly acknowledged. I further confirm that the thesis has not been submitted either in part or in full to any other higher learning institution for the purpose of earning any degree.

_____ Signature & Date

ACKNOWLEDGEMENTS

First of all, I would like to thank the Almighty God who gave me strength and encouragement to complete the courses of this study.

Then, my special thanks and gratitude goes to my advisor Dr. Temesgen Belayneh for his unreserved cooperation, incredible suggestions and supervision.

I would also like to sincerely express my gratitude to the employees of United Nations Economic Commission for Africa for their kind and unlimited support during the survey.

TABLE OF CONTENTS

Declaration.....	iii
Acknowledgements.....	iv
Table of Contents.....	v
List of Tables.....	vii
List of Figures.....	viii
List of Acronyms.....	ix
Abstract.....	x
Chapter One: Introduction.....	1
1.1 Background of the Study.....	1
1.2 Background on Umoja, ERP of the UN.....	2
1.3 Statement of the Problem.....	4
1.4 Objective of the Case Study.....	6
1.5 Scope of the Study.....	7
1.6 Limitations of the Study.....	8
1.7 Organization of the Study.....	8
Chapter Two: Review of Related Literature.....	9
2.1 Enterprise Resource Planning (ERP).....	9
2.2 Critical Success Factors (CFS).....	11
2.3 The United Nations System.....	15
2.4 Umoja – Enterprise Resource Planning (ERP) of the United Nations Secretariat... ..	16
2.5 Theoretical Literature Review.....	19
2.6 Empirical Literature Review	20
2.7 Conceptual Framework.....	20
2.7.1 Dependent Variable (n1): ERP Implementation Success.....	21
2.7.2 Independent Variables; Critical Success Factors.....	22
2.7.2.1 Effective Project Management.....	22
2.7.2.2 Change Management.....	23
2.7.2.3 Training.....	25
Chapter Three: Research Methodology.....	26
3.1 Research Approach.....	26
3.2 Research Design.....	27
3.3 Sampling Method and Sample Size.....	28
3.4 Data Collection Method.....	29
3.5 Data Analysis.....	30
Chapter Four: Data Presentation, Analysis and Interpretation.....	31
4.1 Introduction.....	31
4.2 Demographic Information of the Respondents.....	31
4.3 Descriptive Statistics.....	33

4.3.1 Effective Project Management in relation to the performance of project Manager and Team Members.....	34
4.3.2 Change Management with regards to organizational readiness, communication and top management support.....	35
4.3.3 Training: Identification of needs and requirements, timeliness, sufficiency and effectiveness of training provided.....	36
4.3.4 ERP Implementation Success.....	36
4.4 Reliability Test.....	37
4.5 Validity Test.....	38
4.6 Diagnostic Tests.....	38
4.6.1 Pearson Co-relation Test.....	39
4.6.2 Normality Test.....	39
4.6.3 Linearity Test.....	40
4.6.4 Multicollinearity Test.....	41
4.7 Regression Analysis.....	42
4.7.1 Regression Model Summary.....	42
4.7.2 Regression – ANOVA Table.....	43
4.7.3 Regression Coefficient Analysis.....	44
4.8 Qualitative Analysis.....	45
4.8.1 Effective Project management.....	45
4.8.2 Change management.....	46
4.8.3 Training.....	46
4.8.4 Success of ERP Implementation.....	47
4.9 Discussions on the Findings.....	47
Chapter Five: Conclusion and Recommendation.....	51
5.1 Summary of Major Findings.....	51
5.2 Conclusion.....	52
5.2 Recommendation.....	53
References.....	55
Annex 1 – Questionnaire – End Users.....	i
Annex 2 – Questionnaire – Process Experts.....	v
Annex 3 – The United Nations System.....	ix

List of Tables

Table 1: Respondents age, gender, years of experience and level of education	32
Table 2: Transactional Process Experts Category of Respondents Functional Area of Expertise	32
Table 3: Transactional End User's Response on Effectiveness of Project Management	34
Table 4: Transactional End User's Response on the overall Efficiency and Effectiveness of the Organization's Change Management	35
Table 5: Transactional End User's Response on the Efficiency and Effectiveness of the Training Programmes on the new ERP	36
Table 6: Transactional End user's Response on overall effectiveness of the ERP Implementation	36
Table 7: Reliability Statistics	37
Table 8: Pearson Correlation Matrix of Dependent and Independent Variables	39
Table 9: Multicollenarity Test between Independent Variables	41
Table 10: Regression Model Summary	43
Table 11: Regression – ANOVA	43
Table 12: Regression Coefficient Analysis of the Model	44

List of Figures

Figure 1: Transactional Process Experts of Respondents Functional Area of Expertise	33
Figure 2: Frequency Distribution of Standardized Residuals – Transactional End Users	40
Figure 3: Normal Point Plot of Standardized Residual – End Users	40

List of Acronyms

CFS	Critical Success Factors
ERP	Enterprise Resource Planning
DRP	Distribution Requirement Planning
MRP	Materials Requirement Planning
Umoja	The United Nations Secretariat ERP System
UNECA	The United Nations Economic Commission for Africa
UNHQ	United Nations Head Quarters
UNON	United Nations Office in Nairobi

ABSTRACT

The purpose of this study was to evaluate Enterprise Resource Planning (ERP) implementation against selected critical success factors. The implementation of Umoja, an ERP adopted recently by the UN, at the United Nations Economic Commission for Africa was evaluated against three selected critical success factors. The research focused and discovered that effective project management, change management and training are critical factors that influence successful implementation of an ERP.

To address this study, a case study was employed with both quantitative and qualitative approaches. Yamane sample calculating technique was used to calculate sample size. The total sample size engaged for this study is 133 which included transactional end users of the new ERP system, Umoja, at UNECA. Regression was used to analyze the quantitative data obtained through questionnaire. Qualitative data was also analyzed. Moreover, data validity and reliability tests were also made.

The findings of the study indicate that ERP implementation success at the United Nations Economic Commission for Africa when evaluated against critical success factors was not adequate as measured by the process experts of the system in the organization. The study then concluded that organizations should identify and outline critical success factors applicable in their area of expertise for implementing ERP successfully.

The study recommended improvements in the areas of project management, change management and training be made in the organization to continue the successful utilization of the ERP as well as for future related project implementations of Umoja. In addition, the study directed future works to be conducted on Critical Success Factors not covered in the study as well as ERP implementations in big organizations.

Key Words: Enterprise Resource Planning (ERP), Critical Success Factors (CFS), Umoja, ERP implemented by the UN Secretariat, United Nations Economic Commission for Africa

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Enterprise Resource Planning (ERP) System is a strategic tool which integrates information and information-based processes within and across functional areas in an organization. The main objective of an ERP is to increase operating efficiency by improving business processes and decreasing costs. In addition, ERP standardizes and integrates process and data which in turn allows organizations to centralize administrative activities. (Almgren K & Bach C., 2014)

Organizations around the world have been implementing ERP systems since the 90s to enable uniformity in their information system and to re-engineer business processes. ERP implementation process involves a wide range of complicated resources and issues. (Matende S. & Ogao P., 2013)

A number of studies on ERP implementation are performed on large enterprises that are considered to be appropriate for ERP systems. A review of ERP research indicates that there are a number of strategies for implementing ERP successfully.

ERP implementation is a complex process with many factors affecting it. These factors could have a positive impact on the outcome of the ERP project or lack of them could influence the outcome negatively.

The success or failure of ERP implementation is closely related to how the companies handle the process. The ERP implementation process could differ from organization to organization that might be related to goals, scope or the available resources. But in most implementation processes most important points identified are critical success factors. (Laudon J. et al., 1998)

Different researchers in the past have identified a number of potential success factors enabling evaluation of an ERP implementation. A number of researchers have also identified unified

implementation on critical success factor models based on considerable research regarding implementation success factors and some of them have been demonstrated empirically. (Raafat G.S. and Harshjot N., 2016)

Critical success factor (CSF) is a management term for an element that is necessary for an organization or project to achieve its mission. It is a critical factor or activity required for ensuring the success of a company or an organization. (Raafat G.S. and Harshjot N., 2016)

Identifying CSF's is important as it allows firms to focus their efforts on building their capabilities to meet the critical success factors, or even allow firms to decide if they have the capability to build the requirements necessary to meet Critical Success Factors (CSF's). (F. Jiwat and Corkindale D., 2013)

Critical Success Factors of ERP implementation shapes features which are crucial to confirm that a successful ERP implementation proves to be a beneficial undertaking for an organization. Factors considered critical for a particular organization and project cannot have the required weight in another organization. But most critical success factors identified in a number of researches include Top Management Support, Vendor and Consultant Competencies, Training and Education, Project Management, Change Management and other technical related factors. (F. Jiwat and Corkindale D., 2013)

1.2 Background on Umoja, ERP of the UN

The UN has adopted a new ERP named "Umoja" in its General Assembly resolution of December 2012. "Umoja", meaning unity in Swahili is the UN's reform initiative designed to help the UN operate more effectively by integrating and streamlining business processes that manage financial, human and physical resources within a single global solution for the entire UN Secretariat. Umoja is, therefore, an enabling environment which gives meaning to becoming truly global and having standardized business processes replacing the over 400 legacy systems that were in use in different offices of the organization. Umoja is estimated to cost USD 439.4 million upto the end of 2017. (<https://www.unumoja.net>)

Umoja is designed to help harmonize the way the UN works, providing a single data repository with reliable, real-time information. It is far more than an Information Technology project; it is an organizational transformation that will enable high-quality and cost effective service delivery around the world. (<https://www.unumoja.net>)

This transformation initiative aims to renew the way the UN manages financial and human resources and bring it to standards; boosts decision making by associating programmes and operations with allocated resources; decreases the necessary time to finalize administrative processes and at the same time increasing efficiency. In addition, Umoja renews the way the UN manages human, financial and material resources to bring the organization up to accepted common standards; enhances decision-making by linking programmes and operations with the allocated resources and reduces the average time required for administrative processes. (<https://www.unumoja.net>)

Umoja is being used in more than 400 locations in the world with more than 33,000 self-service users and 13,700 transactional users. Umoja is accessible anywhere through internet. (<https://www.unumoja.net>)

Umoja is an ERP implemented across the whole UN Secretariat in phases and clusters to hasten implementation progress as indicated below:

- 1. Foundation:** The first phase of Umoja deployment covering functional areas of Finance-funds management & financial accounting; Supply Chain- Real Estate, Plant Maintenance, Logistics Execution and Procurement; Project Management and Central Support Services – Services Delivery. The deployment of this phase started in November 2013 and completed.
- 2. Extension 1** – The second phase of Umoja deployment covering the functional areas of Human Resources – organizational and position management, personnel administration, entitlements, benefits, time management and payroll; Central Support Services – travel management. The deployment of this phase started in June 2015 and is completed.

3. **Extension 2** – The third phase of Umoja deployment covering functional areas of Finance – budget formulation; Human Resources – force planning; Programme and Project Management – programme management & full grants management; Supply Chain Management – warehouse planning; Central Support Services – conference and events management, facilities management real estate planning and office space administration. The deployment of this phase will start in September 2017. (<https://www.unumoja.net>)

As the offices of the UN Secretariat are scattered all around the world, the deployment of Umoja was administered in five clusters. Cluster one included all United Nations Peacekeeping Missions, deploying Foundation Phase in November 2013. Cluster two involved all Special Political Missions deploying foundation phase in March 2014. The third cluster consisted of Office of Human Rights, United Nations Office in Nairobi, United Nations Environmental Programme, UN Habitat, Economic and Social Council for Asia and the Pacific and United Nations Assistance to the Khmer Rouge Trials and deployed phases of Foundation and Extension one in June 2015. Cluster four embraced United Nations Head Quarters, United Nations Office in Geneva, United Nations Office in Vienna, Economic Commission for Africa, Economic and Social Council for Western Asia, Economic Commission for Latin America and the Caribbean and Economic Commission for Europe and deployed Foundation and Extension one in November 2015. The fifth cluster deployed Extension one in Special Political and Peace Keeping Missions in September 2016. The forecasted date for Umoja full implementation is December 2019. (<https://www.unumoja.net>)

The United Nations Economic Commission for Africa (UNECA) was founded in 1958 to encourage economic cooperation among its member states (the nations of the African continent). It is one of the five regional commissions under the administrative direction of the United Nations Headquarters (See Annex 3)

1.3 Statement of the Problem

Implementation of an ERP system affects organizations in a considerable manner. ERP should improve efficiency and simplify processes. Challenges and problems encountered during implementation phase will have an overall effect in the achievement of the objective of having an ERP System.

UNECA was one of the duty stations to be covered in cluster 3 of the Umoja implementation scheduled for June 2015 but was left out because of doubts on organizational readiness. The implementation was then postponed to the next cluster, i.e., cluster 4, implemented in November 2015.

The organization was not ready to embrace the new ERP system in terms of re-organizing the structure to fit the new business processes. In order to prepare staff to adopt to new ways of working, the impacts of change should systematically be evaluated by the organization. Some functional areas might have significant increase in processes and in some areas reduction of a number of review and approval steps in some business processes.

Advocacy and popularization efforts of the big change coming were not as effective as desired although communication and aides available were sufficient. A project team was organized from functional structure of the organization covering all functional areas. A project manager was appointed to lead the project very late in the implementation process. Moreover, the IT team supporting the previous legacy systems being replaced by the ERP were not involved in the Implementation of Umoja which in turn led to unavailability of post implementation support in the duty station. Umoja local team and the project management office were performing a significant amount of additional and unplanned work as the focus was only on the viability of the technical solution provided by the system but not on the new way of working would be successfully implemented.

Although resources were readily available to facilitate implementation of the ERP, approval of resources required a significant amount of time and push from project team. This indicates that top management support of the project was not adequate. Furthermore, data cleansing, testing, validation and migration activities did not meet deadlines set in advance.

With regards to Training, training needs have not been assessed with precision and users were inadequately trained prior to the deployment of Umoja. The implications of inadequate training include mistakes, high volume of support requests (post implementation), creation of alternative ways to perform activities instead of using the system. Thorough training required for process experts and managers was not provided adequately and timely. The new ERP did not provide an environment for hands on training on the system.

Theoretical review has revealed that critical success factors are important in order to measure the success of ERP implementation success. Furthermore, a number of empirical studies have different views on factors vital for ERP implementation success. Critical success factors contributing to the success of ERP implementation have been examined from different points of scrutiny. (Nat et al., 2003). Several researchers have acknowledged a range of factors that could be critical to the success of an ERP system implementation. To illustrate a few, Somers and Nelson (2004) documented twenty-two critical success factors which incorporate Top Management Support, Education on new processes and User Training. Moreover, Al-Mashari et al (2003) pinpointed twelve critical factors including ERP selection, project management, training and education, business process management, cultural and structural change management.

Another group of researchers, Umble et al. (2003) divided the factors into ten major categories that are commitment by top management, clear understanding of strategic goals, Excellent implementation of project management, great implementation team, coping up with technical issues, organizational commitment to measures and multi-site issues resolved. Another researchers have classified critical success factors into three major categories and further declassified them into seventeen. Dezdar S., & Sulaiman A., (2009). Dezdar (2010) established that critical success factors are quite instrumental in determining ERP

implementation success. Which factors are the most relevant is a question that depends on the type and structure of organizations.

The Research Questions addressed by this study are:

1. How successful was the overall project management in the implementation phase of Umoja at UNECA?
2. How effectively was the change managed in the overall implementation?
3. How was the leverage of the training to meet specific learning or skills requirements of the new ERP?

The paper is motivated by the author's involvement in the ERP implementation process as a member of the project team as a Local Process Expert in some functional areas and current involvement as a lead staff member on user registration and administration in the system.

1.4 Objective of the Case Study

The Objective of this study against the above background is to evaluate the Implementation of Umoja at the United Nations Economic Commission for Africa against selected critical success factors.

The study evaluated the following against selected critical success factors:

1. The success of overall project management during the implementation of the UN ERP System "Umoja" at the United Nations Economic Commission for Africa
2. The effectiveness of the project management
3. The effectiveness of the change management process
4. The leverage trainings had to meet specific learning or skills requirements and

1.5 Scope of the Study

The study is limited to the implementation/deployment of the ERP at the United Nations Economic Commission for Africa and discusses the period from February 2015 to December 2015 covering the pre-implementation preparation, implementation including the go-live and the post implementation period of Umoja at UNECA indicated in cluster 4 of the table above.

Umoja Implementation at the United Nations Economic Commission for Africa was deployed in Phases which incorporated four phases. February to mid October 2015 was allocated to training, testing, validation and migration of data. Mid October to November was dedicated to training and black out period which had to stop all legacy systems and forced paper transaction of all activities with special back out forms. 9 November was the date Umoja went live. Mid November to end of December 2015 was the post implementation period capturing black out data transaction into Umoja and normal operations in the new ERP. It is worth noting that UNECA migrated the data into another system and actual migration of data into the new ERP was done by United Nations Head Quarters (UNHQ).

1.6 Limitations of the Study

This case study was conducted by a staff member of the organization and the responses of respondents might be influenced by bias, fear and change resistance factors.

1.7 Organization of the Study

This research paper is organized into six chapters in order to provide clarity and coherence on the topic. The first chapter discusses and provide sufficient background on the issue and constitute the statement of the problem, objectives, research questions, scope as well as the limitations of the study. The second chapter holds review of different literatures and presentation of the existing studies and their findings. The chapter also lays out the conceptual framework of the research to designate the variables and their relationships. The third chapter outlines the research methodology of the study. The fourth chapter focus on the analysis of the results and interpretations of the data collected using appropriate charts, graphs and tables. The last chapter present and summarizes the conclusion and forward appropriate recommendation.

CHAPTER TWO: REVIEW OF RELATED LITERATURE

2.1 Enterprise Resource Planning (ERP)

Enterprise resource planning (ERP) is a multi- segment application software system that assists organizations to modernize their business processes. It transforms organizational transaction activities by replacing a number of stand-alone legacy system with a system that enables organizational-wide integration.

Malhotra and Temponi (2010) defined Enterprise Resource Planning (ERP) as a software that attempts to integrate all departments and functions across a company in to a single computer system that can serve all those departments' particular needs.

ERP has the capacity to integrate all software programs that serve the requirements of specified functions organized into single, integrated software program that runs off a single database so that the various departments can easily share information and communicate with each other. Umble et al., (2013)

ERP is described as a system which enables decision-makers to have an organization-wide view of the information they need in a timely, reliable and consistent manner. ERP systems are designed to enhance organization's competitiveness by upgrading an organization's ability to generate timely and accurate up-to-date reports on all the modules in the ERP throughout the organization. Alaskari O. et al. (2012)

ERP permits organizations a company to systemize, mechanize and amalgamate the business processes, including planning (budgeting), purchasing, human resource, inventory control, interaction with suppliers and customer and keeping track of orders, to share common data and practices across the entire organization, and to produce and access information in a real-time environment. Umble et al., (2013)

As an IT solution, ERP system, if implemented fully across an entire enterprise, connects various components of the enterprise through a logical transmission and sharing of data (John D. et al, 2000).

ERP, a term Gartner Research Group began to use in 1992, evolved from Material Requirements Planning (MRP) and Distribution Requirement Planning (DRP) systems of the 1960s (Esteves et al, 2001). MRP that was used in the 1970's to generate operation schedules, structuring of production system and raw materials purchasing evolved to MRP II in the 1980s for coordinating manufacturing processes. The availability and affordability of new technologies of the 1980's facilitated the integration of business system that derived the material with capacity requirements associated with operation plan (Manneti J., 2001).

The improvement of technology in the early 1990s permitted the development and integration of all business processes that support the planning and control of all resources needed to take customer orders, make the product, ship and account for orders (Manneti J., 2001). The migration to ERP helped to integrate key business process including product design, information warehousing, materials planning, capacity planning, communication systems, human resources, finance, and project management.

ERP system has become one of the most renowned business software in the market place and an essential part of everyday IT investments for many organizations that believe ERP system will deliver resolutions for their IT problems and therefore provide effective online transactions with the current electronic systems era. In addition, it is indicated that, one of the meaningful and global improvements of IT is the wide recognition of ERP system by many organizations including very big public organizations worldwide which brands ERP system as the most rapid growing system in operational area. (Zhang et al, 2008),

Moreover, numerous studies have consistently credited ERP for its ability to improve business decision-making capabilities and organizational performance. The most prominent benefits of an ERP system include refined business process, improved quality and availability of

information, reduced reworking due to manual errors, refined business process and transparency.

ERP systems collect data through a single comprehensive database and make it available to modular applications that support all of a firm's value chain activities across functions, business units, and geographical areas. These systems have emerged as the de facto operating standards for firms and represent generic but multi-level configurable and customizable solutions that incorporate best practices which basically reflect a series of assumptions about how firms operate in general (Madapusi A. and Ortiz D., 2014).

The Gartner Glossary of Information Technology Acronyms and Terms describe ERP as "Business strategies and enabling software that integrate manufacturing, financial and distribution functions to dynamically balance and optimize enterprise resources" (2004). The enterprise system collects data from various key business processes in manufacturing and production, finance and accounting, sales and marketing, and human resources. The system stores data in a single comprehensive data repository where they can be used by other parts of the business (Laudon J. et al, 1998).

A quick review of literature addressing ERP systems implementation reveals that more focus has been directed to success or failure including CSFs, success measurement and evaluation of ERP systems. (Matende & Ogao, 2013)

2.2 Critical Success Factors (CFS)

Critical Success Factors (CSFs) approach was first used by Rockart J. F. in 1979 in Information Science (IS) area. It has been applied to many aspects of IS including project management, manufacturing systems implementation, reengineering, and, more recently, ERP systems implementation. The seminal work of DeLone and McLean (1992) is also one of the earliest to address system implementation success and is the most referenced frameworks on the topic (1992). The model shows the actual dependencies between the relationships of the different success factors as well as recognizing and grouping the factors into categories.

The practicality and relevance of the CSFs came into light in the industry as CSFs became a support to management to direct, plan, manage, monitor and achieve organizational goals (Bullen and Rockart, 1981). Given the obvious significance for the industry, researchers saw the need to recognize CSFs to help resolve production/implementation problems, which give rise to the surge in scholarly publications on CSFs over the past four decades (Dezdar and Sulaiman, 2009; Karuppusami and Gandhinathan, 2006; Khan et al., 2009). Notion of CFS also obtained broader recognition in the information systems purview and, in particular, in the framework of enterprise resource planning (ERP) systems (Finney and Corbett, 2007; Ifinedo et al., 2010).

Different definitions were provided by different authors on CFS, the few things which must go right for Business Process Re-engineering (BPR) to happen successfully (Ogunyemi O. and Olofonsao A., 2014). Some researchers summarize that in order to implement reengineering, an organization needs to understand its structure first, before successful implementation could be accomplished. Another important point is that commitment needs to be maintained and enhanced through communication. This is essential as people are often resistant to change, as such, for any success to be achieved there is need for adequate orientation to ensure a fit. In the same vein management efficiency, organizational structure, ERP planning and management as well as information technology infrastructure are major organizational mechanisms that needed to be put in place to complement the people's orientation for effective implementation (Berrington, C. and Oblich, R., 1995).

As trials in implementation of ERP systems has by high rates of failure and implementation complications (Kanaracus, 2012; Ngai et al., 2008), identifying CSFs became a widespread research agenda to assist in advancing the possibilities of implementation success, resulting in the identification of a considerable amount of apparently relevant CSFs for the successful acceptance, implementation and utilization of ERP systems (Ifinedo et al., 2010).

However, many research inputs focused on detecting CSFs for gaining success in the implementation stage of ERP projects (Nah et al., 2001).

Although a significant amount of effort is put justifying an ERP implementation, not much effort is put in determining the performance measurement mechanism after the system is installed. Part of the reason often cited is the difficulty of quantifying the actual benefits of a new ERP software system. In addition, most ERP project Return on Investment are not defined in the project definition and approval phase, thus making it difficult to determine the payback after implementation. As a result, most of the primary reasons provided for ERP implementation failure are given in terms of factors related to systems rather than business, such as the value gained or lost on an investment relative to the amount of money invested. Some researchers pointed out that despite strategic importance given to ERP projects, there is an unusually high failure rate, sometimes jeopardizing the core operations of the implementing organization (Hong K. and Kim Y.,2002). Part of the reason often cited is the difficulty of quantifying the actual benefits of a new ERP software system. In recent years there has been a great deal of attention given to measuring success in system implementation. (Wong B. and Tien D., 2004)

According to the ERP implementation success can be measured in terms of the project success and the business success. ERP project success is measured whether the project is delivered on time, within budget achieving predetermined goal while the business case is measured in terms of inventory reduction, time to market and personnel reduction (Dezdar S. Sulaiman A., 2009).

Substantial research endeavors have been taken by a number of authors and identified dozens of critical success factors. Blended from fourteen different studies, the two separate lists compiled by (Shanks et al, 2000 and Nah et al, 2003). provided comprehensive coverage of the internal aspects of ERP implementation. A simplified list categorized the factors into three general dimensions: organizational environments, people characteristics, and technical problems. They added an additional vendor support dimension to emphasize the role of ERP software suppliers and a culture impact factor to recognize the unique challenges of adopting ERP in the Chinese context (Zhang et al., 2003).

A narrower perspective to focus on the specific organizational actions to adopt ERP project was taken by Lin et al (2002) . Although worded differently, their factors were similar to the ones in the previous lists. A case study based on one single company in China, discussed a sub-set of six factors Woo H.S., (2007). Built upon DeLone H. and McLean R. (1992) famous IS success model, Chung et al., (1992) specifically studied the technical factors aiming to improve individual user's perceived usefulness to ERP.

The article on Journal of Enterprise Information Management, proposed list of twenty-two critical success factors for consideration in ERP implementation success (Raafat G. and Hrshjot N., 2016).

A broad examination and logical compilation of current research literature on CSF of ERP implementation and presented a new comprehensive nomenclature of CSFs for ERP system implementation (Dezdar S. and Sulaiman A., 2009). Based on the appraisal of academic and industry literature, the following groups of factors are identified as having the most influence in future ERP initiatives achieve greater success and less failure: Clear Compelling Vision, Top Management Support, Project Management, Communication, Change Management, Cultural Factors, Implementation Team, External Expertise and ERP User.(Ngai et al., 2008).

Critical success factors selected for this study are Effective Project Management (Project Manager and Project Team Members); Change Management (Organization Readiness, Top Management Support and Communication) and Training. These critical success factors incorporate a number of dimensions under their purview.

The critical success factors were selected because the organization, i.e., the UN, is instigating a number of initiatives in the context of the above critical success factors. The UN different organs and agencies in the United Nations System are adopting a number of project management methodologies in implementing their activities.

As an organization with a number of new reforms being applied to the whole system, change management is also another critical success factor that is very linked to the organization. The

third CFS in this study is also a very important factor in the United Nations as staff are obliged to spend five working days on training yearly. The organization also spends a substantial amount of budget on training every year.

Because of the reasons cited above, I believe these critical success factors and considering their familiarity with the sample population in the study and would greatly enable evaluation of the recent ERP implementation in the United Nations Economic Commission for Africa.

In addition, a number of researches have tried to rank the importance of critical success factors. Fang L. and Patrecia S. (2005) have ranked 11 Critical Success Factors in order of their importance and the top four being Top Management Support, Business Process Re-engineering, Project team and Change Management and Effective Communication.

This case study will evaluate implementation of Umoja, an ERP of the UN against three selected Critical Success Factors: 1. Effective Project Management (Project Manager and Team Members); 2. Change Management (Organizational Readiness, Communication, Top Management Support); 3. Training. Because of the reasons cited above, I believe these critical success factors and considering their familiarity with the sample population in the study and would greatly enable evaluation of the recent ERP implementation in the United Nations Economic Commission for Africa.

2.3 The United Nations System

The United Nations System consists of the United Nations, its subsidiary organs (including the separately-administered funds and programmes), the specialized agencies, and affiliated organizations. The executive heads of some of the United Nations System organizations and the World Trade Organization, which is not formally part of the United Nations System have seats on the United Nations System Chief Executives' Board for Coordination (CEB). This body, chaired by the Secretary-General of the United Nations, meets twice a year to coordinate the work of the organizations of the United Nations System. (www.un.org)

The United Nations System includes the United Nations and its subsidiary bodies (such as the separately-administered funds and programmes, research and training institutes, and other subsidiary entities), specialized agencies, and affiliated organizations. Some of the organizations of the United Nations System predate the founding of the United Nations in 1945 and were inherited after the dissolution of the League of Nations. The United Nations system includes and is organized in six bodies, funds and programmes, specialized agencies and related organizations which include the United Nations (General Assembly, Security Council, Economic and Social Council, Secretariat, International Court of Justice, Trusteeship Council); Funds and Programmes, Research and Training Institutes & other bodies; Specialized Agencies; Related Organizations (Comprehensive Nuclear-Test-Ban Treaty Organization Preparatory Commission, International Atomic Energy Agency, Organization for the Prohibition of Chemical Weapons, World Trade Organization); Chief Executive Board and Senior Management Group and United Nations Common System. Annex 3 provides a picture of the United Nations System.(www.un.org)

The United Nations Economic Commission for Africa is under the United Nations Secretariat and one of the five Regional Commission in the United Nations Secretariat, Economic Commission for Europe (ECE), Economic and Social Commission for Western Asia (ESCWA); Economic and Social Commission for Asia-Pacific (ESCAP) and Economic Commission for Latin America (ECLAC). (www.un.org)

2.4 Umoja-Enterprise Resource Planning (ERP) of the United Nations Secretariat

UN defines ERP as a software package that improves organizational performance by providing enterprise view of data, processing data in real-time data, standardizing business processes and implementing leading business practices. Umoja is a SAP ERP (Systems, Applications, and Products in Data Processing). (<https://www.unumoja.net>)

Umoja is an administrative reform initiative designed to help the UN operate more effectively by integrating and streamlining business processes that manage financial, human and physical resources within a single global solution for the entire Secretariat. (<https://www.unumoja.net>)

Umoja helps the UN operate more effectively by integrating and streamlining business processes that manage financial, human and physical resources within a single global solution for the entire secretariat. (<https://www.unumoja.net>)

Umoja streamlines people, processes and technology by providing an opportunity for the UN staff to learn new skill sets while continuing to perform value-added tasks; enabling the standardization of processes and administrative practices throughout the Secretariat and providing the un with modernized business processes and an integrated system of record, SAP ERP, 6.0. (<https://www.unumoja.net>)

The objective and benefits of the ERP system of the UN, Umoja, include increased operational effectiveness and timeliness; improved accountability; adoption of international best practices and standards; enhanced transparency; higher client satisfaction and better internal controls. Umoja is also projected to deliver quantitative benefits in ongoing annual productivity and efficiency improvements as a result of refined business processes; improved quality and availability of information; reduced manual effort; reduced reworking due to manual errors and streamlined process flows. (<https://www.unumoja.net>)

The Umoja system is made up of three components that rely on uniform and coherent data supply to keep the it fully integrated. The three components accessed through different portals are:

1. ERP Central Component (ECC) – comprising of Modules - Representing a typical function of the organization; Business - Processes for each module in the system and Transactions – Steps that need to be executed in the correct order
2. Supplier Relationship Management (SRM)– All Procurement functions in Supply Chain and Procurement are performed in this component. It allows functionality of requisitioning, strategic sourcing and solicitations, Contract Life-Cycle Management, Supporting Processes.

3. Business Intelligence – BI component is a data warehouse as well as a reporting tool. It processes data from both the ECC and SRM components and generates meaningful reports.

The three Umoja components accessed through three different portals are integrated with each other permitting users to share and generate meaningful reports. The harmonized and streamlined approach is applied to the following core organizational functions of the United Nations:

1. Finance – (Processes under this function include: Financial Accounting; Cash Management & Treasury; Financial Management; Grants Management; **Budget Formulation, member States Portal, Strategic Enterprise Planning dealing with Performance Reporting Donor Relationship, Implementing Partners** *)
2. Human Resources – (Processes under this function include: Benefits; Entitlements; Organizational and position management; Personnel Administration; Payroll and Time Management; **Force Planning and Management dealing with Force Planning, Deployment, Downsizing, Reimbursement to Member States***)
3. Supply Chain/Procurement/Logistics – (Processes under this function include: Receive to Distribute; Source to Acquire; Services Delivery, Warehouse Planning; **Demand Planning and Forecasting, Supply Network Planning, Inbound Processing, Outbound Processing, Planning and Dispatching, Warehouse and Storage**)
4. Programme & Project Management – (Modules under this function include: Programme and Project Management, Project Initiation, Project Planning, Project Execution, Programme Planning and approvals, programme Execution and Performance, Programme Evaluation and Closure, **Project Management dealing with detailed project design and cost planning, project security and performance, project evaluation and closure**)
5. Central Support Services (Modules under this function include: Real Estate; Travel Management, **Conference and Events Management, Facilities Management incorporating real estate planning, real estate administration and office space**)

management) *Processes in Bold under the four organizational functions are not yet implemented all over the UN Secretariat.* (<https://www.unumoja.net>)

Implementation of Umoja began in the UN Secretariat July 2013 covering different UN offices at different cluster and phases indicated in Chapter 1 of the study. The ERP system was implemented at the United Nations Economic Commission for Africa in November 2015 Addis Ababa being one of the offices in cluster 4 which included Geneva, Vienna, Bangkok, Bonn, Beirut, Santiago de Chile, Tribunals and part of peace keeping and special mission offices. Implementation of Extension 2 (remaining modules) is expected to begin in September 2017. (<https://www.unumoja.net>)

2.5 Theoretical Literature Review

This study looked at many resource of materials on ERP on electronic sources (e-books and journals). The researcher used the world hint of “ERP”, “Enterprise Resource Planning” and “Critical Success Factors” for the search. A number of literature references written in English were utilized. Journals on ERP systems and their Effects on Organizations; ERP Planning, ERP Impact, ERP Design and Implementation; and influence of ERP systems on business process agility were reviewed. Definitions of ERP, it’s evolvement and its ability to improve business decision making capabilities and organizational performance were also discussed.

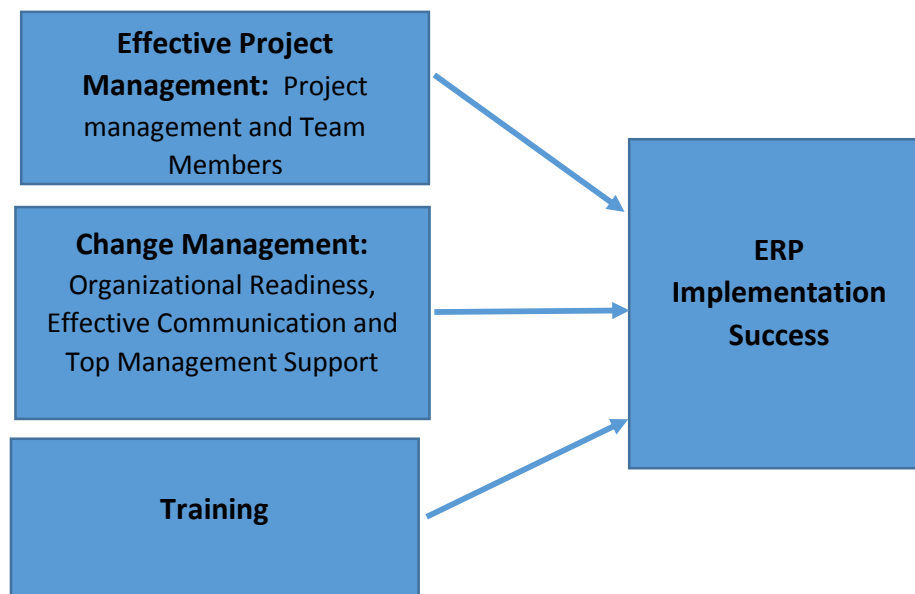
An evaluation of how ERP has been directed to success or failure including Critical Success Factors, Success Measurement and Evaluation of ERP Systems led to review of Critical Success Factors. The theoretical review then addressed first approach of CFS, practicality & relevance, definitions and how CFS can be used to measure implementation of ERP. The theoretical framework linked the research question with the empirical study by selecting three critical success factors.

The theoretical review also examined UN websites to gather information on Umoja, the ERP of the UN and the United Nations System.

2.6 Empirical Literature Review

The Empirical study is based on information and data gathered from a number of articles on evaluation of ERP implementation in Iran, China and Saudi Organizations. The empirical study is put into exercise to answer the research questions. The quantitative approach and questionnaires used are formatted from other studies to gather adequate information from transactional users of the new ERP system by sharing their experience on the selected critical success factors. A number of researchers have tried to rank critical success factors in their order of importance and some have categorized the factors. Studies related to critical success factors are examined in order to form a basis for the development of conceptual framework.

2.7 Conceptual Framework



In this study, a five dimension and respective attributes of the model are expressed using a five point Likert Scale in the following manner: Not at all effective/efficient, somewhat effective/efficient, effective/efficient, very efficient/effective and extremely efficient/effective. Five different scores were assigned: 1, 2, 3, 4, 5 to represent the five-point scale. Hence process experts and end users who perceive that the implementation of

Umoja was effective and efficient with regards to effective project management, change management and training must indicate more than or equal to effective/efficient.

To develop the conceptual framework, the study reviewed the listed articles Mohammed et al, (2011), Evaluation of ERP Implementation at Esfahan Steel Company based on five Critical Success Factors; Sawah et. al, (2008), Quantitative Model to predict the Egyptian ERP Implementation Success Index; Hailu A. and Rahman S., (2012), Evaluation of Key Success Factors Influencing ERP Implementation Success and Shahin D. and Sulaiman A., (2011), The influence of Organizational Factors on Successful ERP Implementation.

2.7.1 Dependent Variable (n1): ERP Implementation Success

ERP Implementation Success depends on the point of view from which you measure it. If ERP implementation success is measured from the side of project manager, their measurement value would be completing the project on time and within the limited budget. But on the side of users of the ERP system, they measure the success on how smooth the operation of the ERP is and how it can achieve business process improvements. (Wong & Tien, 2004)

Researchers have classified six dimensions of ERP success including system quality, information quality, Use, User satisfaction, Individual impact and Organizational impact. Zhang et al., summarized seven measures from previous literature used as surrogates of ERP implementation success (Delone and McLean, 2003). These measures are user satisfaction, intended business performance improvements, Oliver White's ABCD Classification Scheme, on time, within budget, system acceptance and usage and predetermined corporate goals.

This case study examines ERP implementation success from the side of users of the ERP system.

2.7.2 Independent Variables – Critical Success Factors

2.7.2.1 *Effective Project Management*

Effective project management is a critical success factor for ERP implementation. Planning for ERP systems implementations requires an integrated approach to meet the requirements of various functional areas. (Mandal P. and Gunasekaran A. 2003)

Effective project management allows companies to plan, organize, and monitor various activities involved in ERP implementation. (Ngai et al., 2008)

ERP Systems implementations is a set of complex activities involving all business functions and often requiring one to two years of effort. The combination of hardware, software and organizational, human and financial issues make ERP projects very complex that require effective and efficient project management skills. Effective project management involves having a dedicated project manager and team members.

a. Project Manager has a key role to play in the ERP implementation as the success of the implementation depends on the quality of a good project manager. Consequently, it is important that an organization appoints one of their best people to fulfil the role and ensure they have the time available to devote to the implementation. It is possible for the roles of Project Manager and Project Champion to be filled by one individual. However, this is highly dependent on key factors like the size and scope of project, time availability, and the skillset of the individual filling the roles. The responsibilities of a Project Manager include: delivering the project on-time and within budget; ensuring adherence to project scope; maintaining the project plan; signing off on deliverables; reporting and escalating of issues; communicating the project status and ensuring risks are identified and treatment actions completed.

b. Team Members: Team Members of a project must be critical composing of the organization's best and brightest individuals. The team members should be from all functional areas. Involving staff with both business and technical knowledge into project is essential for success. The best people in the organization should be part of the

implementation team in order to encourage innovation and creativity that are important for success. Team members should be given compensations and incentives for successfully implementing the system on time and within the assigned budget.

An ERP project involves all functional areas of an enterprise. Some researchers affirm that the involvement and cooperation of technical and business experts as well as end-users is necessary for an ERP implementation success (Somers M. and Nelson K., 2001). The skills and competence of the project team are also a key factor influencing the success of ERP implementations. The more experience and skill the project team members possess the greater the chance for project success (Wong B. and Tien D. 2004). In addition, they also state that the best and experienced people in the organization should be balanced, selected from cross functional areas of the organization with representatives from the internal staff (Wong B. and Tien D. 2004).

H1. Effective Project Management has a Positive Impact on ERP Implementation Success

2.7.2.2 *Change Management*

a. Organizational Readiness

Fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical contemporary measures of performance of cost, quality, service and speed (Hammer M. and Champy J., 2001). Implementing an ERP system must involve re-engineering the existing business processes to align the best business standards. In the case of Umoja, Mapping of staff members to required roles in the ERP system to enable them perform efficiently. Clear organizational structure should be established and communicated to employees to embrace the new ERP system.

b. Effective Communication

Most enterprise resource planning (ERP) implementations affect an entire organization and enhance an organization's growth strategy. However, to be a viable competitor, organizations must embrace and manage the changes that will occur with the new ERP system. Effective change management leadership guides employees through the processes, and we have provided four key steps leaders can take when communicating change during

an ERP implementation. It is always advisable to Communicate early and often timing is everything.

It is always good to prepare your organization for change. Once an ERP solution is chosen, create a strategy and anticipate points of resistance. Be prepared to address these points before the ERP implementation begins. It is important to address the change formally, such as through email, meetings, organizing informational events and one-on-ones.

In addition, it is always important to prepare brochures, guide, or eBook. An ERP project is a big deal. Let your employees know what is coming and what is expected of them. For instance, an ERP software system will help your organization run more efficiently by eliminating time-wasting processes, however, it is scary for employees to think about changing the way they do their jobs. Therefore, management can explain to staff what the new standards of performance will be and train them to work with the new system.

c. Top Management Support

The support of top management has been widely recognized in ERP implementation and is often at the center of business. If there is no support of top management, there will be no investment and no resource to be used for the project. Without commitment of resources from higher level management, the ERP system is not going to get very far. Top Management Support was the most frequently cited Critical Success Factor for ERP Implementation in most researches reviewed. Top Management Support in ERP implementation has two main areas; providing leadership and providing the necessary resources. A successful implementation is only achievable when high-level executives have a strong commitment to the project (Davenport H., 2000).

Top management support is needed throughout the implementation of any project. Top management support is a necessary condition for ERP implementation success. When ERP implementation oversight is delegated to lower management levels often results in a lack of proper commitment of time and resources required for a successful implementation of the system. Active envelopment and support of senior level management is essential to

provide the necessary fuel and increases lower level managers' willingness to allocate the desired resources to successfully complete the implementation of the system (Nah F. and Delgado S., 2006).

H2. Effectively managing change has a positive impact on ERP Implementation Success

2.7.2.3 Training

Adopting the knowledge rooted in ERP systems is crucial for achieving success in ERP projects (Dezdar and Sulaiman,2009). User education and training assist as a channel to unpack and accelerate the transfer of knowledge embedded in the routines, practices and functions of ERP systems. Training is defined as the consistent transfer of knowledge about the logic, concept, processes and function of the ERP systems. Effective training is considered very crucial to prepare users of an ERP system with the required skills and tools to utilize it efficiently in their day-to- day activities. (Stratman J.K and Roth, A.V, 2002).

An effective training program can assist users to engage the system to the fullest and will result in achieving the full benefits or objectives of implementing the ERP (Umble et. al.,2003).

Three aspects concerning the content of the training are:

1. Logic and concepts of ERP
2. Features of the ERP System Software
3. Hands on training on the system performing detailed activities and business processes

Training employees to use the ERP system and understand their new roles within the solution is an excellent way to prevent resistance from employees. Likewise, it provides employees the chance to see just how helpful the ERP system will be for their tasks and the organization.

Knowledge is power and empowered employees are more likely to handle change in a positive way and adapt to best practices and new processes instead of reverting back to old habits in a

new system. Putting these lessons to practice will help improve business performance across the organization.

An ERP education and training for a successful ERP Implementation:

- Has positive effects in behavior, performance, acceptance of technology, attitudes and beliefs;
- Allows users to understand their work's relation to other functional areas within the company;
- Teaches users to naturally prevent problems in ERP;
- Fights fear and hesitations related to technology;
- Helps overcome reluctance of managers and employees to organizational change brought on by ERP system;
- Provides opportunity for users to learn the abilities and skills essential to the success of the system throughout the organization;
- Ensures use of the information system by employees is efficient and effective.

H3 Training has a positive impact on ERP implementation success

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Research Approach

A case study research involves provision of an in-depth observation of an event or a situation. The method excels in creating an understanding of complex issues or events. Case studies emphasize detailed contextual analysis of a limited number of events or conditions and their relationships.

According to Yin (2009), case studies can be used to explain, describe or explore events, or phenomena in the everyday contexts in which they occur and in turn can help to understand and explain casual links and pathways resulting from a new policy initiative or service development. Case study approach lends itself well to capturing information on more explanatory “how”, “what” and “why” questions e.g. how an intervention being implemented is received on ground.

The knowledge obtained from this case study is based on primary research data. Nonetheless, supporting arguments, discussions and information found in various reports and websites are integrated where necessary.

3.2 Research Design

In order to answer the research problem and address the research objectives thoroughly, the research design utilized the conceptual framework in Chapter two to evaluate the success of ERP implementation against selected critical success factors. The research used explanatory research method. The research analyzed the significance the selected critical success factors of effective project management, change management and training have on ERP implementation success.

3.3 Sampling Method and Sample Size

The total population of existing staff of United Nations Economic Commission for Africa is around 770. Although the ERP is implemented, Umoja, is being used by all staff members at UNECA, most staff utilize the ERP as Employee Self Service users occasionally, i.e., once in a month to certify monthly time and attendance summary, to record their live events like marriage or birth of a child or to process individual travel requests.

Taking into account that the above total population will not be able to provide the necessary information to address the research questions, a sampling frame is used to pin down the population size to 220 by selecting transactional users of Umoja, the ERP system, in carrying out their duties and responsibilities, i.e. staff members who are working on the administrative, financial and operational modules of the ERP on a daily basis.

To determine sample size, Yamane sample calculating technique with 95% confidence level and 5% margin of error, resulting a sample size of 142.

$$N = \frac{N}{(1+Ne^2)}$$

The sample size of transactional users is then divided into two, 100 being for end users currently operating on the system on a daily basis and 42 for local process experts who participated as deployment team members during the implementation of Umoja and are certified as experts in one of the functional areas or modules of the ERP. Process Experts were asked qualitative questions to share their experience of what worked well, what could have been done better and recommendation for future endeavors. Transactional End Users responded to quantitative Likert scale questionnaires.

Non probability, purposive sampling is used as the sample is selected on the basis of researcher's knowledge of population. Babbie E., (1990) and MacNealy M. (1999). Purposive sampling is selecting a sample on the basis of the knowledge of the researcher, on the population, its elements, and the nature of the research.

Definitions are provided below:

Process Experts: in addition to being transactional users, process experts are certified as local process experts in one of the following five functional areas or modules of the ERP system, Umoja.

1. Finance – (Financial Accounting; Cash Management & Treasury; Financial Management; Budget Formulation)
2. Human Resources – (Benefits; Entitlements; Organizational and position management; Personnel Administration; Payroll and Time Management; Force Planning)
3. Supply Chain – (Receive to Distribute; Source to Acquire; Services Delivery, Warehouse Planning)
4. Programme & Project Management – (Programme and Project Management, Grants Management and Donor Relationship)
5. Central Support Services (Real Estate; Travel Management, Conference and Events Management)

End Users: Staff members who are transactional users operating in Umoja (the ERP system) in one of the functional areas or modules above daily to carry out their duties and responsibilities.

3.4 Data Collection Method

The study used primary data collecting tools. Two sets of questionnaires which contained close-ended and open-ended questions were used. The process experts were asked open ended questions and end users were asked close-ended questions that assessed implementation of Umoja, the new ERP of the UN against selected critical success factors. Two groups of questionnaires were prepared to assess the ERP implementation success from perspective of the transactional users who participated in the implementation process

and users of the system. As each factor, studied several references, the detail of these factors were used to create a questionnaire.

Questionnaires were distributed on 11 and 12 May 2017 and data was collected from 15 - 25 of May 2017. The researcher went personally to the locations/offices of the sample population and distributed the questionnaires to respondents.

A total of 100 and 42 questionnaires were distributed to end-users and process experts respectively. A total of 133 questionnaires served as a data for analysis to present the findings and draw conclusion.

The information gathered from the questionnaire consisted of quantitative ordinal data and qualitative data.

The questionnaires used are tested from a research work of Mohammad R. M, Mohammad D. J. and Asefeh A., Evaluation of the ERP Implementation at Esfahan Steel Company Based on Five Critical Success Factors: A Case Study, published in the international Journal of Business and Management Vol. 6 No. 5, May 2011.

3.5 Data Analysis

To accomplish the task of data analysis for quantitative data, the researcher assigned codes based on themes of the critical success factors and used the coding process to generate the description of the theme for the analysis. The quantitative data received from the respondents was analyzed with the help of statistical software program: Statistical Package for Social Sciences (SPSS). The data was interpreted by using tables, graphs and applying reliability, diagnostic tests and as well as correlation and regression analysis. The qualitative data was analyzed and organized under each critical success factor and is presented at the end of Chapter four.

CHAPTER FOUR: DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction

In this section, the collected data results are discussed in detail. The two different sets of questionnaires used address the three critical success factors selected for this case study and are described below.

The questionnaire to the process experts contained four open ended questions on what worked well, what could have been done better and suggested recommendation on all the three critical success factors and the overall ERP implementation were also included. The qualitative findings will be addressed in the last part of this section.

The questionnaire to transactional end users contained four, six and five questions on effective project management, change management and training respectively and one question on the dependent variable, ERP implementation success, which are used for quantitative analysis. Three open ended questions on what worked well, what could have been done better and suggested recommendation on all the three critical success factors and the overall ERP implementation were also included. The qualitative findings will be addressed in the last part of this section.

4.2 Demographic Information of the Respondents

As depicted in table 1 below, from the category of respondents of end users, 46.9% of the respondents are in the age group of 40-50; 55% of them are male and 49% have work experience of 10-20 years. With regards to level of education of the end users, 49% and 41% of the respondents are BA and Master's degree holders.

When we review the category of respondents of process experts, 25.7% are in the age group of 30-40 and 57.1% are in the age group of 40-50. The majority of the respondents, i.e. 51.4% of process experts are female. BA degree holders are 45.7% and while 48.6% have Master's

degree. In this category, 42.9% of the respondents have 10-20 years of work experience while 31.4% are in the work experience group of 10-20 years.

Table 1: Respondents age, gender, years of experience and level of education

		End Users				Process Experts			
		Frequency	Percent	Valid Percent	Cumulative Percent	Frequency	Percent	Valid Percent	Cumulative Percent
Age	20-30	6	6.1	6.1	6.1	3	8.6	8.6	8.6
	30-40	33	33.7	33.7	39.8	9	25.7	25.7	34.3
	40-50	46	46.9	46.9	86.7	20	57.1	57.1	91.4
	50-60	13	13.3	13.3	100.0	3	8.6	8.6	100.0
Gender	Female	44	44.9	44.9	44.9	18	51.4	51.4	51.4
	Male	54	55.1	55.1	100.0	17	48.6	48.6	100.0
Years of Experience	0-10	33	33.7	33.7	33.7	11	31.4	31.4	31.4
	10-20	48	49.0	49.0	82.7	15	42.9	42.9	74.3
	20-30	10	10.2	10.2	92.9	9	25.7	25.7	100.0
	30-40	7	7.1	7.1	100.0				
Level of Education	High School	3	3.1	3.1	3.1				
	Diploma	6	6.1	6.1	9.2	2	5.7	5.7	5.7
	BA Degree	48	49.0	49.0	58.2	16	45.7	45.7	51.4
	Masters	41	41.8	41.8	100.0	17	48.6	48.6	100.0
	Total	98	100.0	100.0		35	100.0	100.0	

Source: Primary Data May 2017

Table 2: Second Category of Respondents Functional Area of Expertise

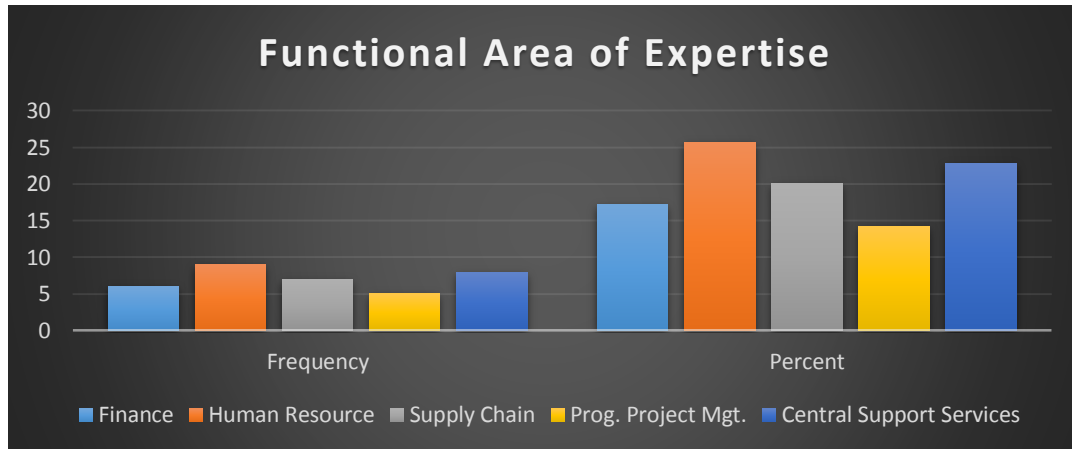
In which Functional Area are you a process expert		Frequency	Percent	Valid Percent	Cumulative Percent
		Finance	6	17.1	17.1
Human Resource	9	25.7	25.7	42.9	
Supply Chain	7	20.0	20.0	62.9	
Prog. Project Mgt.	5	14.3	14.3	77.1	
Central Support Services	8	22.9	22.9	100.0	
	Total	35	100	100	

Source: Primary Data May 2017

Table 2 illustrates the second category of respondent's area of expertise with regards to the new ERP of Umoja. 25.7% and 22.9% of the respondents are process experts in the functional areas of Human Resources and Central Support Services. Supply Chain, Finance and Programme & Project Management represent 20%, 17.1% and 14.3%

respectively. Therefore, data is gathered proportionally from all functional areas. Figure 1 is used to illustrate the proportionality of inclusion of process experts from all functional areas.

Figure 1: Second Category of Respondents Functional Area of Expertise



Source: Primary Data May 2017

4.3 Descriptive Statistics

4.3.1 Effective Project Management in relation to the performance of the Project Manager and Team Members

The discussion in this part relates to the descriptive statistics result of the three independent variables in relation to ERP implementation success at the United Nations Economic Commission for Africa.

The first variable considered in this study as a critical success factor contributing to successful implementation of ERP is effective project management. To evaluate how critical was effective project management as a factor contributing to success of implementation of Umoja at UNECA different number of questions were asked to the two respondent groups of end users and process experts.

Table 3: Transactional End User's Response on Effectiveness of Project Management

No.	Effective Project Management - End Users	N	Minimum	Maximum	Mean	Std. Deviation
EPM1	Effective Clarity of Tasks to be performed during the implementation of ERP	98	1	4	2.42	.772
EPM2	Effectiveness of Questions Answered by Project Team and Project Manager	98	1	4	2.45	.734
EPM3	Efficient Information on the Progress of the ERP Implementation	98	1	5	2.95	.901
EPM4	Effectiveness of accessibility of Project Team Members and Project Manager for Issues Raised on the ERP	98	1	5	2.49	.922

Source: Primary Data May 2017

As illustrated by table 3 above, the mean on EPM for respondent group of end users is less than 3 the lowest being 2.42 on clarity of tasks to be performed during the implementation of ERP and the highest 2.95 on efficiency of information provided on the progress of the project. This is indicative that the organization has to work more on establishment of effective project management office while undertaking projects of this magnitude.

The overall results in this category also suggest that for successful implementation of projects, effective project management plays a crucial role.

4.3.2 Change Management with regards to organizational readiness, communication and top management support

Table 4: Transactional End User’s Response on the overall Efficiency and Effectiveness of the Organization’s Change Management

No.	Change Management - End Users	N	Minimum	Maximum	Mean	Std. Deviation
CM1	Efficiency of revision of business processes for the new ERP	98	1	4	2.69	.805
CM2	Efficiency of provision of role requirements before go live	98	1	4	2.37	.978
CM3	Efficiency of smoothness of transition from legacy systems to the new ERP	98	1	5	2.26	.791
CM4	Efficiency of support of Top management during Implementation	98	1	5	2.72	.928
CM5	Effectiveness of advocacy and popularization efforts in preparation for the new ERP	98	1	5	3.19	.949
CM6	Effectiveness of information materials explaining the new ERP	98	1	5	3.11	1.004

Source: Primary Data May 2015

The second independent variable considered in this study as a critical success factor contributing to successful implementation of ERP is change management. A different set of questions related to organizational readiness, communication and top management support were presented to the respondents to evaluate if the organization has followed proper change management strategies to embrace the new ERP, before, during and after implementation of the new ERP Umoja.

As presented by Table 4 above, the highest mean is 3.19, CM5, effectiveness of advocacy and popularization efforts and the lowest mean is 2.26, CM3, efficiency of smoothness of transition from the previous legacy system to the new ERP.

The results are indicative of the improvement the organization needs to employ in the area of organizational readiness and preparedness. The end users have indicated that the advocacy and popularization efforts were adequate for the new ERP. Provision of role requirements in the new ERP- CM2, revision of business processes - CM1 and top management support – CM4 have scored mean of 2.37, 2.69 and 2.72 respectively suggesting additional determination required by the organization in improving these areas of change management.

4.3.3 Training: Identification of needs and requirements, timeliness, sufficiency and effectiveness of training provided

Table 5: Transactional End User’s Response on the Efficiency and Effectiveness of the Training Programmes on the new ERP

No.	Training - End Users	N	Minimum	Maximum	Mean	Std. Deviation
TR1	Effectiveness of the timing of the Training	98	1	5	2.78	.880
TR2	Efficiency and Usefulness of the Content of the Training Received	98	1	5	3.26	.853
TR3	Efficiently logging into the portals and modules of the ERP	98	2	5	3.20	.919
TR4	Efficiency in using te system to avoid making mistakes	98	1	5	2.31	.957
TR5	Efficiency in using the system to avoid using alternative method of processing activities	98	1	5	1.97	.895

Source: Primary Data May 2017

Questions related to identification of needs and requirements, timeliness, sufficiency and effectiveness of trainings provided to prepare staff for the new ERP were presented to the respondents and below is summary of their response.

As illustrated by table 5 above, the lowest mean TR5 indicates that the training provided was not adequate and staff had to use alternative methods to process their activities after go live. The end users have also indicated that they have made a lot of mistakes at the beginning of using the system for the first time, TR4 which has a mean of 2.31. This is indicative that the training that was provided was not adequate enough for the end users to feel confident when using the system for the first time. The highest mean is on being able to login to the portals and modules of the system.

4.3.4 ERP Implementation Success

Table 6: Transactional End User’s and Process Response on overall effectiveness of the ERP Implementation

End Users	N	Minimum	Maximum	Mean	Std. Deviation
Overall ERP Implementation Success	98	1	5	2.74	.678

Source: Primary Data May 2017

As shown on table 6 above, the respondents believe that the ERP implementation was not adequately successful indicating that there are a number of problems to be addressed. The mean indicates that overall ERP Implementation Success is below the adequate scale of 3.

4.4 Reliability Test

Table 7: Reliability Statistics

Reliability Statistics			
	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
End users	.860	.861	4

Source: Questionnaire and SPSS Output (2017)

In research of case study, reliability findings must be confirmed. Reliability is assessment of the extent to which a question, instrument or measure gives correct results. Cronbach's alpha is a coefficient of reliability used to measure the internal consistence of a scale; represented as a number between 0 and 1. According to Zikmund et al., (2010) scales with coefficient alpha between 0.6 and 0.7 indicate fair reliability.

The questionnaires contained 4 questions on Effectiveness of Project Management, 6 on Change Management, 5 questions on Training – representing the independent variables and 1 question on the dependent variable overall ERP implementation success which makes a total of 19 questions.

The researcher conducted the Cronbach's alpha reliability test by using SPSS (statistical package for the Social Sciences) and found that 86% of the responses are reliable as illustrated in table 7 above.

4.5 Validity Test

Data validity is the measure that the questionnaire is measuring what it is supposed to measure. In addition, it estimates the acceptability of the result as well as examining if research findings are really representing what they should.

To maintain data integrity, design and structure of the questionnaire was performed with great attention and caution. The questionnaire was adopted and modified from a previous research works of Mohammad R. M, Mohammad D. J. and Asefeh A., Evaluation of the ERP Implementation at Esfahan Steel Company Based on Five Critical Success Factors: A Case Study, December 2010 and Somist D. (2013), Factors Influencing the success of an ERP system: A study in the context of an Agricultural Enterprise in Thailand. In addition, the research questions were approved by my Advisor.

4.6 Diagnostic Tests

Before commencing into regression analysis to test the impact critical success factors have on success of ERP implementation, some diagnostic tests were conducted to ensure the appropriateness of data to assumptions regression analysis.

4.6.1 Pearson Co-relation Test

In this Section the correlation between the dependent variable (ERP Implementation Success) and the independent variables (Effective Project Management, Change Management and Training) are presented and analyzed. A correlation matrix is used to confirm the correlation between the variables.

Table 8: Pearson Correlation Matrix of Dependent and Independent Variables

		Correlations			
		ERP Implementation Success	Effective Project Management	Change Management	Training
ERP Implementation Success	Pearson Correlation	1			
	Sig. (2-tailed)				
Effective Project Management	Pearson Correlation	.855**	1		
	Sig. (2-tailed)	.000			
Change Management	Pearson Correlation	.769**	.611**	1	
	Sig. (2-tailed)	.000	.000		
Training	Pearson Correlation	.605**	.419**	.389**	1
	Sig. (2-tailed)	.000	.000	.000	
N		98	98	98	98

Source: Questionnaire and SPSS Output (2017)

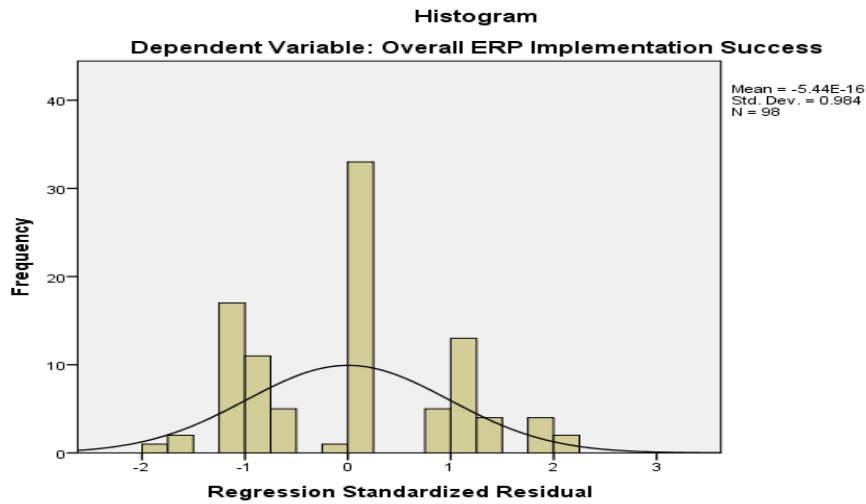
According to Stigler S. (1989) the Pearson correlation coefficient is a measure of the linear correlation between two variables X and Y . It has a value between $+1$ and -1 , where 1 is total positive linear correlation, 0 is no linear correlation, and -1 is total negative linear correlation.

The results in the below correlation matrix, table 8 indicate that the highest correlation of 0.855 between effective project management and ERP Implementation Success, $.769$ between change management and ERP Implementation Success and 0.605 between training and ERP Implementation Success. All the results are between 0 and $+1$ and it can be concluded that in this study there is no problem of multicollinearity between the results. Therefore, the variables are retained for the use of estimations.

4.6.2 Normality Test

Figure 2 below indicates, the frequency distribution of the standardized residuals compared to a normal distribution. As it can be inferred, although there are some residuals that are far away from the curve around the mean and many of the residuals are fairly close. In addition, as the histogram is bell shaped and the residuals are normally distributed.

Figure 2: Frequency Distribution of Standardized Residuals

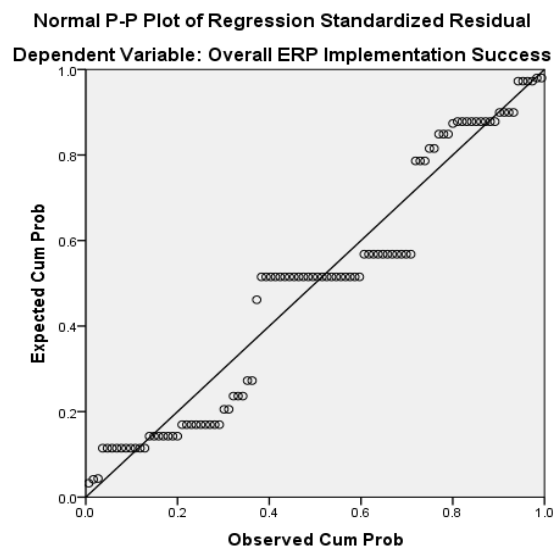


Source: *Questionnaire and SPSS Output (2017)*

4.6.3 Linearity Test

Linearity test signifies the degree to which the change in the dependent variable is related to the change in the independent variables. To establish that the relationship between the dependent variable, ERP Implementation Success, and the independent variables; Effective Project Management, Change Management and Training is linear; plots of the regression residuals through SPSS had been used.

Figure 3: Normal Point Plot of Standardized Residual – End Users



Source: *Questionnaire and SPSS Output (2017)*

The result indicates that the relationship that the case study tries to predict is more or less linear with outliers as the residuals around the mean are skewed, indicating existence of a number of outliers. This result depicts that although anonymity of the questionnaire is clearly indicated, there is influence of fear factor and change resistance for some of the respondents.

4.6.4 Multicollinearity Test

Multicollinearity refers to a situation in which two or more explanatory/independent variables in a multiple regression model is highly linearly related. Multicollinearity is diagnosed by examining the tolerance and variance inflation factors.

Table 9: Multicollenarity Test between Independent Variables

Independent Variables	Collinearity Statistics for Transactional End Users	
	Tolerance	VIF
1 (Constant)		
Effective Project Change Managem Training	.588	1.700
	.605	1.652
	.796	1.256

a. Dependent Variable: Overall ERP Implementation Success End Users

Source: Questionnaire and SPSS Output (2017)

Table 9 illustrates that the independent variables are highly linearly related with a score of tolerance of level of minimum 0.59 in all cases and variance inflation factor of more than 1 in all cases. Therefore, it can be concluded that the explanatory/independent variables are highly linearly related.

4.7 Regression Analysis

The three dimensions/independent variables given in the referred scale, led to the three positive hypothesis. The case study is investigating that whether the three dimensions have a significant impact on ERP (Umoja) Implementation Success at the United Nations Economic Commission for Africa.

H1: Effective Project Management has a Positive impact on ERP Implementation Success

H2: Efficient Change management has a Positive impact on ERP Implementation Success

H3: Efficient and Effective Training has a Positive impact on ERP Implementation Success

Empirical test was made on the hypotheses formulated above by exercising regression model.

Operational Model used for this study to evaluate the statistical significance of the selected critical success factors for ERP Implementation in the case of United Nations Economic Commission for Africa is derived below:

$$EIS = \alpha_1 + \beta_1 * EPM + \beta_2 * CM + \beta_3 * TR.....$$

Where: EIS stands for ERP Implementation Success at the United Nations Economic Commission for Africa and

Independent Variables: Effective Project Management (EPM), Change Management (CM) and Training (TR). Regression results are described in the tables below.

4.7.1 Regression Model Summary

R-Squared measures how well the linear model explained above fits a set of observations. In other words, it explains the strength of the relationship of the dependent variable (ERP Implementation Success) with the independent variables (Effective Project management, Change Management and Training).

Table 10 below illustrates that the adjusted R-Squared value for the regression model were 0.872, which in turn explains that the independent variables in this study justify 87% of the level of ERP implementation success. The remaining, 12.8% variation in ERP implementation success are explained by other variables/critical success factors which are not incorporated in this study. Therefore, the critical success factors used in this study are good explanatory variables for ERP implementation success.

Table 10: Regression Model Summary

Model Summary for End Users and Process Experts				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
Transactional End Users	.936 ^a	0.876	0.872	0.243

- a. Predictors: (Constant), Training, Change Management, Effective Project Management
 b. Dependent Variable: Overall ERP Implementation Success

Source: Questionnaire and SPSS Output (2017)

4.7.2 Regression-ANOVA Table

The ANOVA test in table 11 predicts a significance value of 0. It depicts that there is a statistically significant correlation between the dependent variable and independent variable in both cases. Thus, it can be concluded that the independent variables, critical success factors, effective project management, change management and training have significant impact on success of ERP implementation. Thus the hypotheses are all accepted.

Table 11: Regression - ANOVA

		ANOVA ^a				
Model		Sum of Squares	df	Mean Square	F	Sig.
Transactional End Users	Regression	39.079	3	13.026	220.875	.000 ^b
	Residual	5.544	94	.059		
	Total	44.622	97			

Source: Questionnaire and SPSS Output (2017)

4.7.3 Coefficient Analysis

The table below depicts that all three independent variables are considered critical for ERP implementation success and can significantly influence it. Effective project management and change management are the most important critical success factors in ERP implementation, effective project management has emerged as the most important critical success factor with β values of .457, followed by change management and training with β values of .301 and .274 respectively.

Furthermore, the results of the regression further indicate that all of the critical success factors are significant at the 95% confidence level with values of <0.05 . A rise in critical success factor of effective project management by 1 standard deviation will increase the ERP implementation success by 0.544. A rise in change management by 1 standard deviation will increase ERP implementation success by 0.342. A rise in training by 1 standard deviation will have an impact of 0.244 on ERP implementation success.

Therefore, the researcher has found out that the critical success factors indicated as independent variables in this study have a significant impact in ERP implementation success which in turn justifies that the United Nations Economic Commission for Africa will have to improve its performance on effective project management, change management and training to have successful implementations in future related and new endeavors. Therefore, all the three hypotheses are accepted.

Table 12: Coefficient Analysis of the Model

		Coefficients ^a				
Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
Transactional End	(Constant)	-.107	.126		-.848	.399
Users	Effective Project Management	.457	.040	.544	11.476	.000
	Change Management	.301	.041	.342	7.312	.000
	Training	.274	.046	.244	6.001	.000

a. Dependent Variable: Overall ERP Implementation Success

4.8 Qualitative Analysis

In this section, qualitative analysis of open ended questions that were answered by the respondents will be analyzed. The respondent's replies on what worked well, what could have been done better and recommendations if they had any for future endeavors on all the variables that is Effective Project Management, Change Management, Training and Success of ERP Implementation are organized below.

4.8.1 Effective Project Management

On this independent variable, the respondents implied that project management towards the end of the project was managed by an experienced change management expert. In addition, targets and time frames were set clearly by United Nations Head Quarters which also has added to the successful implementation of the project. The respondents also indicated that the local deployment team was very determined for the deployment of the ERP. Moreover, the team organization was also pointed out as an area that worked well.

Respondents were also requested to elaborate on what could have been better and their reply revealed that recruitment of project manager for this type of huge project should have been done with care. Due to lack of proper management of the project, the project team had to work under huge pressure towards the closure of the project. Furthermore, although the objective of the project was set by Head Quarters, it was not clearly defined and explained to team members and in turn was the cause of vagueness on most of the activities and did not enable the team to foresee where the project was going. The selection of the project team and local process experts should have been based on how well they could transfer knowledge. Involving more process experts from all the functional areas would have made a number of experts available to assist transactional users during post implementation as well as provision of trainings. The respondents also indicated that the project management office was not efficiently involved in the global implementation meetings that were held before the implementation to provide clear instruction to the process experts.

4.8.2 Change Management

With regards to this independent variable, the respondents revealed that communication was handled creatively and comprehensive job aides and videos were available on most business processes. In addition, kiosks established in the compound equipped with brochure and process experts explaining the new change has contributed a lot to create awareness on staff about the big change coming. Respondents also recognized the resourceful website dedicated to the project operated by the project team leading the project at the United Nations Head Quarters. It was also specified that change impact documents distributed to team members involved during the implementation by United Nations Head Quarters Office leading the project, facilitated the comprehension of the “as is” and “will be” processes. Timely introduction of the system was timely.

The respondents elaborated that changes made were based on the United Nations Head Quarters workflow and did not consider the local constraint of operation which led to lack of developed standard operation procedures for processes in the new ERP system. Inadequate alignment of work flow and human resources to the “will be” business processes resulted in implementation of new way of working with the “as is” model. Limited involvement of senior and middle level management in ensuring organizational readiness was also specified as one of the short comings of the project. Unavailability of change management team in the project would have by far increased the effectiveness of the project. Lack of a dedicated Umoja Support Office equipped with qualified staff is another point raised as a deficiency. The respondents also noted out that there was lack of organizing back log of processes.

4.8.3 Training

With regards to the leverage the training programmes had on transactional users, one of the points raised as to what worked well was the availability of computer based certifying and mandatory trainings which started well ahead of time. Sufficient training materials were also available on line.

The respondents raised a number of points on what could have been done better on this variable which include lack of information on mandatory trainings required by staff to take before go live, inadequate training received by process experts which in turn resulted in inability to train end users properly and unavailability of training environment on the system. In addition, the respondents specified that due to lack of training, some useful features of the system could not still be utilized in ECA.

4.8.4 Success of ERP Implementation

With regards to the dependent variable, the respondents have indicated that the system has helped utilization of common resources among offices in the UN Secretariat and its accessibility through internet 24/7 from anywhere is a plus that can be added to meeting the objective of its implementation. The implementation of Umoja within the specified schedule is one of the facts indicated as what worked well.

The respondents have also revealed that the implementation of Umoja was done not in a smart way but in hard way which did not take into consideration the human element. The unavailability of project support office is one of the elements indicated as what could have been done better as staff are forced to call and contact by email United Nations Office in Nairobi and United Nations Head Quarters in New York for all system related problems. This also led to lateness in responding to problems with the system either due to time difference or inability to follow up as required.

4.9 Discussions on the findings

Implementing ERP systems brings an organization's business process and data access together in an integrated manner resulting in significant changes in how organizations do business. ERP system implementations are huge investments and consume an organizations financial resources and are in turn expected to bring about benefits in operational effectiveness, accountability, transparency, decision making and client satisfaction. These benefits are obtained through refined business processes, improved quality and availability of information and streamlined process flows. Implementing an

ERP system would enable organizations to decommission their fragmented legacy systems which do not communicate with each other.

Effective project management is very crucial for successful implementation of an ERP as the competency, dedication and involvement of project manager and team members is imperative to make implementation a success. It is imperative that a competent implementation team should be put in place involving the organization's finest individuals. (Finnery & Corbett, 2007). An ERP project includes all functional areas of an enterprise. The effort and cooperation of process experts is compulsory for the success of an ERP implementation. Therefore, involving people with both business and technical knowledge into project is essential for success. The best people in the organization should be part of the implementation team in order to have innovation and creativity that are crucial for success (F. F. H. Nah & Delgado, 2006)

As can be observed from the findings of this case study, emphasis should have been given onboarding a capable and experienced project manager from the onset of the project and adequate team members should have been organized in a manner that addresses all the functional areas of the organization. As can be depicted from the scores of mean of responses of both end users and process experts, the performance of the organization on this critical success factor is below average.

Organizations often have to change the way they do business in order to successfully implement an ERP system (Su and Yang, 2010). Dunn et al. (2005) argued that if change management is not handled well, ERP projects are apt to fail. The findings of this case study elaborates that, the transactional users of the organization perceived that the change management process was not adequate except in the areas of communication, advocacy and communication efforts as well as availability of informational materials explaining the new ERP system.

The organization needs to invest more on organizational readiness in terms of realignment of business processes, involvement of top and middle level managers and identification of

role requirements in the new ERP system. Alignment of work flow and human resources should have been performed early in the implementation of the ERP to make the organization ready to embrace the new ERP and adopt to the “will be” processes. Unavailability of a dedicated support office on site was also one of the problems cited by the transactional users.

The support and assurance from top management are critical success factors that can improve the ERP system utilization of employees in an organization, for successful ERP implementation (Chang M. et al, 2008), because the top management influences can facilitate the user acceptance of new system by broadcasting the system benefits to the employees (Aladwani, A.M., 2001). As findings indicate that both end users and process experts believe that the management support in the implementation of Umoja was less than adequate.

Project team should let all in the organization be aware of the meaning of the project, as well as its scope and schedule (Sumner M.,1999). The implementation process was creative with regards to handling of communication related activities. In addition, availability of comprehensive job aids and videos on most business processes helped users to utilize the new system by their own. The Umoja website administered by United Nations Headquarters was also indicated as a very resourceful tool during and after the implementation of the ERP. The quantitative findings from both process experts and end users are indicative that communication used during the project implementation were adequate.

An effective training program can assist users to engage the system to the fullest and will result in achieving the full benefits or objectives of implementing the ERP. User training is one of the most critical factor for implementation success. It also often leads to user acceptance and facilitate the desired transformation as well as adoption of the new system. In addition, it is expected to improve users’ levels of comfort and their expertise and knowledge of the system as well as influencing the system success and post-implementation operational outcomes. The findings of this case study indicate that the

respondents from the group of transactional end users were not at all comfortable in using the system at first although they were somewhat satisfied in the timeliness, usefulness and content of the training. Process Experts on the other hand believed that identification of requirements, effectiveness of the training, sufficiency of the programmes were less than adequate. In addition, the findings of the qualitative analysis depict that computer based trainings were available and trainings were conducted efficiently but were not effective enough to make end users feel confident in utilizing the system as there were shortcomings in the areas of late start in the beginning of trainings for process experts and limited number of process experts trained and the system not having a simulated training environment.

Overall ERP implementation success was rated successful in terms of common utilization of resources among all UN offices, being global and internet based as well as being completed within the schedule. It was perceived to be not successful with regard to being implemented in a hard not smart way, not having a local support office/help desk and not considering the human element.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATION

5.1 Summary of Major Findings

As indicated in Chapter one, the objective of this study against the above background is to evaluate the Implementation of Umoja at the United Nations Economic Commission for Africa against selected critical success factors that are proved to evidently examine the implementation process and to give answer to the following research questions:

1. How successful was the overall project management in the implementation phase of Umoja at UNECA?
2. How effectively was the change managed in the overall implementation?
3. How was the leverage of the training to meet specific learning or skills requirements of the new ERP?

Below are the summary of the findings:

- Representation of the respondents was fairly distributed in age, gender, years of experience and area of expertise with regard to process experts.
- All the respondents are active transactional users of Umoja and the process experts participated in Umoja implementation process
- Pearson co-relation test indicated that all the independent variables are correlated with the dependent variable
- The regression model summary depicts adjusted R square value of 0.872, explaining that the independent variables of this case study justify 87.2% level of ERP implementation success. The remaining 12.8% are justified by other variables not incorporated in this model.
- The ANOVA test also explained with 0 significance, depicting that there is statistically significant correlation between the dependent and independent variable.

5.2 Conclusion

Achieving operational efficiency has become very challenging for organizations especially giant public organizations. As a result, several organizations across the world are using an IT application such as Enterprise Resource Planning (ERP) to refine their business processes, to make information readily available and streamline process flows. For organizations like the United Nations, achieving operational efficiency is key to its success and attaining trustworthiness in the face of member states resulting in transforming of the organization as mandated by the General Assembly.

The Objective of this study against the above background is to evaluate the Implementation of Umoja at the United Nations Economic Commission for Africa against selected critical success factors, examine the implementation process's challenges and setback and also suggest possible recommendations and provide lessons learned as the organization is moving forward to the third phase of the ERP Implementation.

The study has conducted quantitative and qualitative analysis of the questionnaires, reviewed documents and evaluated the ERP implementation success at the United Nations Economic Commission for Africa against selected critical success factors.

Having an ERP is a big investment to implement and maintain it is considered that the benefits of having the system will outweigh the costs in a few years after implementation.

Considering the investments organizations spend on implementing ERPs, it is always decisive that they review and understand the environment they are operating in and prepare the organization and staff for the big change in an effective and efficient manner by reflecting on critical success factors, highly pertinent to the success of the implementation process. It is also very critical to manage, support and maintain permissible control of the system to get the best out of the benefits it brings to organizations.

To conclude and based on the findings, the case study has reflected that the ERP implementation success at the United Nations was less than adequate in terms of effective project management, change management and training and a number of challenges that faced the implementation process have been pointed out although the ERP was implemented on the planned go live date. The study has also specified that critical success factors have an important role to play in ERP implementation success and the organizations should select and prepare themselves on Critical Success Factors that are important in their area of specialty.

5.3 Recommendation

In this age, change has become inevitable whether it is brought about by the decision of top management of organizations or forced by operational challenges. As a result, each functional area of the organization should undertake the changes in an efficient manner.

Although the case study was conducted on a specific organization, the results and recommendations can be applied by other similar organizations. Based on the findings of the study, the following recommendations are forwarded:

- In this environment of consistent changes, United Nations Economic Commission for Africa should establish Change Management Office responsible for preparing the organization for coming changes and monitoring & provision of recommendations for the impact the changes bring about
- Establish an ERP support Office with available resources to deal with regular checks of what is working and what is not and provide technical support that are within the tolerated level permitted by the UNHQ and
- Thorough recruitment and selection of project manager and team members required for future implementation of Umoja remaining phases and other endeavors of the organization.
- Conduct continuous progressive trainings to enable transactional users familiarize themselves to the numerous modules in the ERP system

- Revisit the realignment of Work Processes and Work Flows often to fit the new ERP, Umoja.
- Involve all senior and level management in trainings and the whole implementation process
- Improve planning as it facilitates communication and control by defining the means of delivering objectives as success of any project depends on effective planning the organization followed
- Based on the achievements of the communication methods used, try to widen the advocacy and popularization efforts to increase acceptance of the ERP
- More studies should be conducted on Umoja and critical success factors required for successful ERP implementation.

References

- Abdulelah A. and Majed A.A., (2015), Implementing ERP Systems in Government: Case Study of Saudi Organization, Lecture Notes on Software Engineering, Vol. 3, No. 2.
- Abdesamad Z. and Pierre F., (2014), The Critical Success Factors of the ERP System Project: A Meta-Analysis Methodology, The Journal of applied Business Research, Volume 30, No.5
- Aladwani, A. M. (2001). Change management strategies for successful ERP implementation. *Business Process Management Journal*, 7(3), 266-275.
- Alaskari, O., Ahmad, M. M., Dhafr, N., & Pinedo-Cuenca, R. (2012). Critical successful factors (CSFs) for successful implementation of lean tools and ERP systems. *Proceedings of the World Congress on Engineering Vol III*. WCE: London. Retrieved November 25, 2012
- Al-Mashari, M., A., Al-Mudimigh, & Zairim M. (2003). Enterprise Resource Planning: A Taxonomy of Critical Factors. *European Journal of Operational Research*, 146(2), 352-365. analysis”, *Proceedings of the 8th European Conference on Information Systems*, Vienna, Austria.n, Vol. 16 No. 1, pp. 5-22.
- Alizadeh, A., & Hanifzadeh, P. (2006). Review the critical success factors in ERP Implementation and their ranking. *Faslname Elmi- Pajooheshi Sharif [Persian]*, 36, (pp. 87-99).
- Arun K. M. (2008), Post Implementation Evaluation of Enterprise Resource Planning (ERP) Systems.
- Basu, V., & Lederer, A. L. (2011). Agency theory and consultant management in enterprise resource planning systems implementation. *Database for Advances in Information Systems*, 42(3), 10-33.
- Berrington, C. and Oblich, R. (1995), How Engineering Transforms Organizations to Satisfy Customers, *Engineering Construction and Architecture*,
- Bullen, C.V. and Rockart, J.F. (1981), “A primer on critical success factors”, Sloan Working Paper No. 1220-81, CISR No. 69.
- Chang, M., Cheung, W., Cheng, C., & Yeung, J. H. (2008). Understanding ERP system adoption from the user's perspective. *International Journal of Production Economics*, 113(2), 928-942.

- Chung, B.Y., Skibniewski, M.J. and Kwak, Y.H. (2009), "Developing ERP systems success model for the construction industry", *Journal of Construction Engineering and Management*
- Chung, B.Y., Skibniewski, M.J., Lucas, H.C. Jr and Kwak, Y.H. (2008), "Analyzing enterprise critical success factors in ERP systems implementation in Australia and China: a cultural
- Davenport, T.H. (2000), *Mission critical: realizing the promise of enterprise systems*. Boston, Mass.: Harvard Business School Press
- DeLone, W.H. and McLean, E.R. (1992), "Information systems success: the quest for the dependent variable", *Entrepreneurship Theory Practice*, Vol. 3 No. 1, pp. 60-95.
- Dezdar, S., & Sulaiman, A. (2009). Successful enterprise resource planning implementation: taxonomy of critical factors, *Industrial, Management & Data Systems*, 109(8), 1037-1052
- Dunn, C.L., Cherrington, J.O. and Hollander, A.S. (2005), *Enterprise Information Systems: Egyptian Organizational Context*. European and Mediterranean Conference on Information Systems, Cairo, Egypt.
- Earl B., (1990), *survey Research Methods*, Wadworth Publishing Company
- Esteves, J. and Pastor, J. (2001), 'Enterprise Resource Planning Systems Research: An Annotated Bibliography', *Communications of the Association for Information Systems*, vol. 7, no. 8, August, pp. 1-52.
- Fang C., (2004) *Critical Success Factors of ERP Implementation in Chinese State-owned Enterprises*, Master's Thesis, Department of Information Processing Science, University of Oulu
- Finnery, S., & Corbett, M. (2007). ERP implementation: a compilation and analysis of critical success factors, *Business Process Management Journal*, 13(3), (pp. 329-347).
- Francoise, O., Bourgault, M., & Pellerin, R. (2009). ERP implementation through critical success factors' management. *Business Process Management Journal*, 15(3), (pp. 371-394).
- Gartner. (2004). *The Gartner Glossary of Information Technology Acronyms and Terms*, [Online] Available: www.gartner.com/6_help/glossary/Gartner_IT_Glossary.pdf , Gartner. (December 20, 2010)
- Hailu A and Rahman S., (2012) *Evaluation of Key Success Factors Influencing ERP Implementation Success*

- Goyette S. et al, (2015), The ERP Post-Implementation Stage: A Knowledge Transfer Challenge
- Hammer, M., and J. Champy, 2001, *Reengineering the Corporation: A Manifesto for Business Revolution*, HarperCollins, New York.
- Hong, K.K. & Kim, Y.G. (2002), The critical success factors for ERP implementation: an organizational fit perspective, *Information & Management*, 40(1), 25-40.
- Ifinedo, P. (2006). Extending the Gable et al. enterprise systems success measurement model: a preliminary, study. *Journal of Information Technology Management*, 17(1), (pp. 14-33).
- Ifinedo, P. and Nahar, N. (2006), "Do top-and mid-level managers view enterprise resource Interaction *International Conference on System Sciences (HICSS'03)*. eds. P. Banerjee (Springer: Big Island, Hawaii, 2003), pp.212-219.
- Kanaracus, C. (2011). The 10 Biggest ERP Software Failures of 2011. IDG News Service. December 20, 2011 <http://www.cfoworld.com/technology/27824/10-biggest-erpsoftware-failures-2011?page=0,3>
- Karuppusami, G. and Gandhinathan, R. (2006), "Pareto analysis of critical success factors of total quality management: a literature review and analysis", *The TQM Magazine*, Vol. 18 No. 4.
- Khan, S.U., Niazi, M. and Ahmad, R. (2009), "Critical success factors for offshore software development outsourcing vendors: a systematic literature review", paper presented at the Fourth IEEE International Conference on Global Software Engineering.
- Klaus, H., Rosemann, M., & Gable, G.G. (2000). What is ERP? *Information Systems Frontiers*, 2(2), 141-162.
- Laudon, J., & Laudon, K (1998) *Management Information Systems: new approaches to organization and technology* (5th ed.), Macmillan Publishing Co. Ltd
- Lin, H.Y., Hsu, P.Y. and Ting, P.H., 2006. ERP systems success: An integration of IS success model and balanced scorecard. *Journal of Research and Pra*
- Li F and Patrecia S., (2005), *Critical Success Factors in ERP Implementation*, Presented to Jonkoping International Business School Theses
- MacNealy M., 1999, *Strategies for Empirical Research in Writing*

- Mandal, P. & Gunasekaran, A. (2003). Issues in implementing ERP: A case study. *European Journal of Operational Research*. 146(2), 274–283
- Madapusi A. and Ortiz D.A, 2014, The Influence of Technical Competence Factors in ERP System Implementations, *Journal of Applied Business and Economics*, Vol. 16(2)
- Manetti, J. (2001). How technology is transforming manufacturing. *Production & Inventory Management Journal*. 42(1). 54-64.
- Malhotra R, C. Temponi (2010), Critical Decisions for ERp Integration, *Small Business Issues*.
- Matende S. and Ogao P. (2013) Enterprise Resource Planning (ERP) System Implementation: A Case for User Participation.
- Mohammad R.M., Mohammad D.J. and Asefeh A, Evaluation of the ERP Implementation at Esfahan Steel Company Based on Five Critical Success Factors: A Case Study, *International Journal of Business and Management* Vol. 6, No. 5; May 2011
- Nah, F., & Delgado, S. (2006). Critical success factors for Enterprise Resource Planning implementation and upgrade. *Journal of Computer Information Systems*. 47. 99-113.
- Nah, F.F. Zuckweiler H., and Lau K.M, (2003), “ERP implementation: chief information officers’ perceptions of critical success factors”, *International Journal of Human-Computer*
- Nah, F. F., & Lau, J. L. (2001). Critical Factors for successful implementation of enterprise system. *Business Process Management Journal*, 7(3), (pp. 285-296).
- Ngai, E.W.T., Law, C.C.H. & Wat, F.K.T. (2008). Examining the critical success factors in the adoption of enterprise resource planning. *Computers in Industry*. 59(6). 548-564.
- Ogunyemi O. and Olofinsao A., (2014), Case Study Analysis of Factorys (Success & Failure), Affecting ERP Planning Implementation in Nigeria.
- Raafat G. S. and Harshjot N., (2016), Critical Success Factors in Enterprise Resource Planning Implementation: A review of Case Studies, *Journal of Enterprise Information Management* resource planning systems implementation success in China, in *36th Annual .Hawaii International Conference on System Sciences*

- R. Jiwat and Corkindale D, (2013), How “Critical” are the Critical Success Factors (CFS)? Examining the role of CFS for ERP
- Rockart, J. F. (1979). Chief executives define their own data needs. *Harvard Business Review*, 57(2), 81.
- Sawah S et al, (2008), Quantitative Model to Predict the Egyptian ERP Implementation Success Index
- Shahin D. and Sulaiman A., (2011), the Influence of Organizational Factors on Successful ERP Implementation
- Shanks, G. G., Parr, A. N., Hu, B., Corbitt, B. J., Thanasankit, T., & Seddon, P. B. (2000). Differences in critical success factors in ERP systems implementation in australia and china: A cultural analysis. *ECIS*, 537-544.
- Somers. T.M. & Nelson K. (2001). The Impact of Critical Success Factors across the Stages of Enterprise Resource Planning Implementations. 34th Annual Hawaii International Conference on System Sciences.
- Somist D. (2013), Factors Influencing the success of an ERP System: A study in the context of an Agricultural Enterprise in Thailand.
- Stigler, Stephen M. (1989). "Francis Galton's Account of the Invention of Correlation". *Statistical Science*. 4 (2): 73–79
- Stratman, J.K., Roth,A.V., (2002), ERP competence constructs: two-stage multi-item scale development and validation*. *Decision Sciences* 33(4),601–628.
- Sumner, M. (1999). Critical success factors in enterprise wide information management systems projects. *Proceedings of the 1999 ACM SIGCPR Conference on Computer Personnel Research*, 297-303.
- Sylvia Patrecia and Li Fang, (2005), Critical Success Factors in ERP Implementation, Jonkoping International Business School taxonomy of critical factors”, *Industrial Management & Data Systems*, Vol. 109 No. 8.
- Umble, E.J., Haft, R.R., Umble, M.M., 2003. Enterprise resource planning: implementation procedures and critical success factors. *European Journal of Operational Research* 146 (2), 241–257. Vol. 135 No. 3, pp. 207-16. Vol. 18, pp. 357-80.
- Wong, B. & Tein, D. (2004), Critical Success Factors for ERP Projects, *Journal of the Australian Institute of Project Management.*, 24(1), 28-31

Wong, B., & Tein, D., (2003), Critical Success Factors in Enterprise Content Management: Toward a Framework for Readiness Assessment.

Woo H.S. (2007), Critical Success Factors for Implementing ERP: The Case of Chinese Electronics Manufacturing

<https://www.unumojja.net>

<https://www.un.org>

Zhang, L., Lee, M.K.O., Zhang, Z. and Banerjee, P. (2003), “Critical success factors of enterprise resources planning systems implementation success in China”, Proceedings of 36th Hawaii International Conference on System Sciences, Big Island, HI, USA.

Zhang, M., Sarker, S. and Sarker, S. (2008), “Unpacking the effect of IT capability on the performance of export-focused SMEs: a report from China”, Information Systems Journal, Vol. 18, pp. 357-80.

Annex 1 – Questionnaire – Transactional End Users



Addis Ababa University
School of Commerce

Evaluating Enterprise Resource Planning (ERP) Implementation Against Selected Success Factors: A Case Study on ERP Implementation, “Umoja” at the United Nations Economic Commission for Africa

Dear Respondents

As a partial fulfillment of Master’s Degree in Project Management at Addis Ababa University, School of Commerce, I, Fetsum Kurabachew am conducting a case study on Evaluating Umoja Implementation Against Selected Critical Success Factors at the United Nations Economic Commission for Africa. I kindly request your assistance to fill out the questionnaire. The information provided will only be used for this case study and your response is highly valued in the success of this research paper. The questionnaire is anonymous and please do not indicate your name.

1. The questionnaire is based on your experience and involvement in Umoja implementation. The questionnaire is designed to evaluate the success of Umoja implementation by selected three critical success factors. The findings of the study will propose possible solutions to the challenges and setbacks encountered during Umoja implementations and denote lessons learned for future endeavors.

2. In this questionnaire the following definitions apply

Effective Project Management: Effective project management includes having a dedicated *project manager* and *project team* which are full-time personnel, including a project manager and team members representing the core areas of the business. The role the project manager and team members play have significant impact on the successful implementation of Enterprise Resource Planning Projects.

Change Management: The areas covered by change management include organizational readiness, effective communication and top management support.

Organizational Readiness involves rethinking and redesign of business processes to align them to best business standards as well as successfully testing and validation of data to be migrated to the new ERP System. **Communication** incorporates advocacy and popularization efforts and informing all staff and concerned on the change that is coming and leveling expectations.

Top Management Support: Providing leadership and resources as well as actively participating in the implementation process.

Training: Identification training needs, timing of training, formal training program, training materials, equipping all concerned with the necessary training, and review and repeat sessions.

Umoja End Users

Age

1. 20-30
2. 30-40
3. 40-50
4. 50-60

Gender

1. Female
2. Male

Year of Experience

1. 0-10 years
2. 10-20 years
3. 20-30 years
4. 30-40 years

Indicate the highest level of education

1. High School
2. Diploma
3. BA Degree
4. Masters
5. PHD

Were you aware of the existence of the project management office

1. Yes
2. No

Effective Project Management

Q1. How effectively clear were tasks to be performed by you during implementation (pre-implementation, black-out period, go-live and post implementation periods)?

1. Not at all effective
2. Somewhat effective
3. Effective
4. Very Effective
5. Extremely Effective

Q2. How effectively well were your questions answered by the project team and manager?

1. Not at all effective
2. Somewhat effective
3. Effective
4. Very Effective
5. Extremely Effective

Q3. How efficiently well were you informed on the progress of Umoja implementation?

1. Not at all efficient
2. Somewhat efficient
3. Efficient
4. Very Efficient
5. Extremely Efficient

Q4. How effectively easy were you able to access project team members for any issues related to Umoja?

1. Not at all effective
2. Somewhat effective
3. Effective
4. Very Effective
5. Extremely Effective

Please provide comments on what worked well, what could have been done better? What recommendations do you have for future endeavors?

Change Management

Q1. How efficiently well were the processes revised in the functional area that you are working on for Umoja?

1. Not at all efficient 2. Somewhat efficient 3. Efficient 4. Very Efficient 5. Extremely Efficient

Q2. How efficiently well were your role provisioning requirements done before go live date?

1. Not at all efficient 2. Somewhat efficient 3. Efficient 4. Very Efficient 5. Extremely Efficient

Q3. How efficiently smooth was the transition from the previous legacy system (IMIS) to Umoja?

1. Not at all efficient 2. Somewhat efficient 3. Efficient 4. Very Efficient 5. Extremely Efficient

Q4. How efficient was the support of Top management during implementation of Umoja?

1. Not at all efficient 2. Somewhat efficient 3. Efficient 4. Very Efficient 5. Extremely Efficient

Q5. How effective were the advocacy and popularization efforts prepare you to prepare yourself for Umoja?

1. Not at all effective 2. Somewhat effective 3. Effective 4. Very Effective 5. Extremely Effective

Q6. How effectively well the informational materials explained the new ERP, Umoja?

1. Not at all effective 2. Somewhat effective 3. Effective 4. Very Effective 5. Extremely Effective

Please provide comments on what worked well, what could have been done better? What recommendations do you have for future endeavors?

Training

Q1. How effective was the timeliness of the training you received in preparation for the use of Umoja?

1. Not at all effective 2. Somewhat effective 3. Effective 4. Very Effective 5. Extremely Effective

Q2. How efficiently useful were the content of the training you received in preparation for the use of Umoja?

1. Not at all efficient 2. Somewhat efficient 3. Efficient 4. Very Efficient 5. Extremely Efficient

Q3. How efficiently were you able to log into Umoja Portals and modules of the ERP after go live?

1. Not at all efficient 2. Somewhat efficient 3. Efficient 4. Very Efficient 5. Extremely Efficient

Q4. How effectively did you utilize Umoja not to make mistakes often while using the system after go live?

1. Not at all effective 2. Somewhat effective 3. Effective 4. Very Effective 5. Extremely Effective

Q5. How effectively were you using Umoja not to use alternative method due to difficulty of using the system?

1. Not at all effective 2. Somewhat effective 3. Effective 4. Very Effective 5. Extremely Effective

Please provide comments on what worked well, what could have been done better? What recommendations do you have for future endeavors?

Umoja Implementation Success

Q1. How effective was the success of the overall Umoja implementation?

1. Not at all effective 2. Somewhat effective 3. Effective 4. Very Effective 5. Extremely Effective

Please provide comments on what worked well, what could have been done better? What recommendations do you have for future endeavors?

Annex 2 – Questionnaires – Process Experts



Addis Ababa University School of Commerce

Evaluating Enterprise Resource Planning (ERP) Implementation Against Selected Success Factors: A Case Study on ERP Implementation, “Umoja” at the United Nations Economic Commission for Africa

Dear Respondents

As a partial fulfillment of Master’s Degree in Project Management at Addis Ababa University, School of Commerce, I, Fetsum Kurabachew am conducting a case study on Evaluating Umoja Implementation Against Selected Critical Success Factors at the United Nations Economic Commission for Africa. I kindly request your assistance to fill out the questionnaire. The information provided will only be used for this case study and your response is highly valued in the success of this research paper. The questionnaire is anonymous and please do not indicate your name.

1. The questionnaire is based on your experience and involvement in Umoja implementation. The questionnaire is designed to evaluate the success of Umoja implementation by selected three critical success factors. The findings of the study will propose possible solutions to the challenges and setbacks encountered during Umoja implementations and denote lessons learned for future endeavors.

2. In this questionnaire the following definitions apply
Effective Project Management: Effective project management includes having a dedicated *project manager* and *project team* which are full-time personnel, including a project manager and team members representing the core areas of the business. The role the project manager and team members play have significant impact on the successful implementation of Enterprise Resource Planning Projects.

Change Management: The areas covered by change management include organizational readiness, effective communication and top management support.

Organizational Readiness involves rethinking and redesign of business processes to align them to best business standards as well as successfully testing and validation of data to be migrated to the new ERP System. **Communication** incorporates advocacy and popularization efforts and informing all staff and concerned on the change that is coming and leveling expectations.

Top Management Support: Providing leadership and resources as well as actively participating in the implementation process.

Training: Identification training needs, timing of training, formal training program, training materials, equipping all concerned with the necessary training, and review and repeat sessions.

Process Experts/Members Umoja Implementation Team

Age

1. 20-30
2. 30-40
3. 40-50
4. 50-60

Gender

1. Female
2. Male

Year of Experience

1. 0-10 years
2. 10-20 years
3. 20-30 years
4. 30-40 years

Indicate the highest level of education

1. High School
2. Diploma
3. BA Degree
4. Masters
5. PHD

In which functional area(s) are you a process expert

1. Finance
2. Human Resources
3. Supply Chain
4. Prog. Project Mgt.
5. Central Support Services

Effective Project Management

As a member of Umoja Implementation Team and by applying the definitions provided (Project Manager and Team Members), please provide your views on the following:

What worked well?

What could have been done better?

What recommendations do you have for future endeavors?

Change Management:

As a member of Umoja Implementation Team and by applying the definitions provided on organizational readiness, communication and top management support, please provide your views on the following:

What worked well?

What could have been done better?

What recommendations do you have for future endeavors?

Training:

As a member of Umoja Implementation Team and by applying the definitions provided on training, please provide your views on the following:

What worked well?

What could have been done better?

What recommendations do you have for future endeavors?

Umoja Implementation Success:

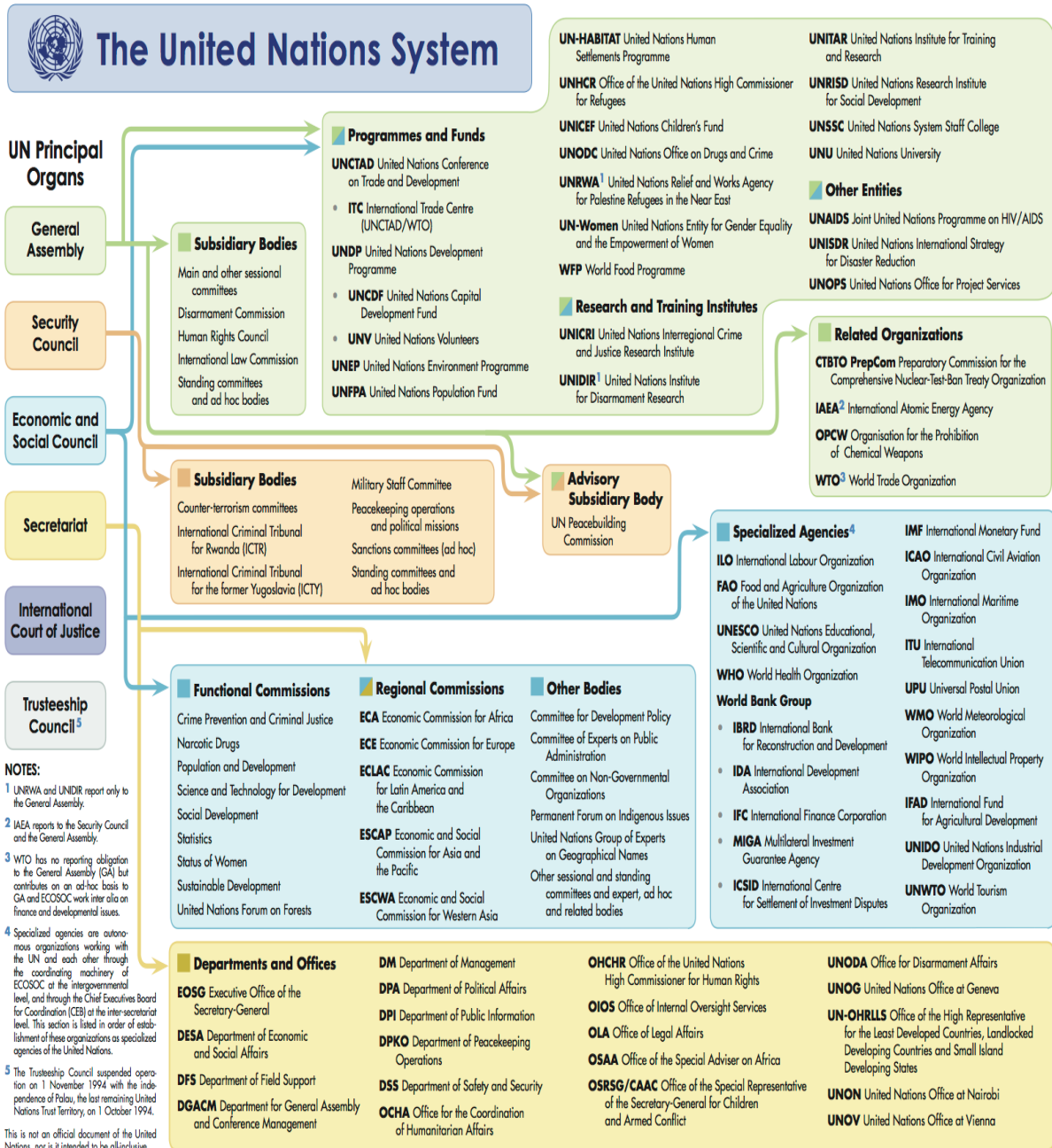
As a member of Umoja Implementation Team and by applying the definitions provided on ERP Implementation Success, please provide your views on the following:

What worked well?

What could have been done better?

What recommendations do you have for future endeavors?

Annex 3 – The United Nations System



Published by the United Nations Department of Public Information DPI/2010 rev.2 - 11-36429 - October 2011