CRITICAL SUCCESS FACTORS IN IMPLEMENTATION OF ENTERPRISE RESOURCE PLANNING: A CASE STUDY OF HASS PETROLEUM GROUP

BY

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DECLARATION

I declare that this research project is my original work and has never been submitted to any other University for assessment or award of a degree.

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This research project has been submitted with our authority as the university supervisor.

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DEDICATION

I dedicate this project to my family for their support and encouragement.

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I would like to sincerely appreciate my supervisor for guidance and support during the preparation of this research project. I would also like to acknowledge my fellow colleagues for their encouragement during the research project period. They played a great role in the completion of this project.

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LIST OF ABBREVATIONS

CSF	Critical Success Factor
DRC	Democratic Republic of Congo
ERP	Enterprise Resource Planning
ICT	Information Communication Technology
IS	Information System
IT	Information Technology
ITPOSMO	Information, Technology, Processes, Objectives and values, Staffing and skills, Management Systems and structures, and Other resources
KE	Kenya
LPG	Liquefied Petroleum Gas
PIEA	Petroleum Institute of East Africa
RW	Rwanda
SO	Somalia
SPSS	Statistical Package for Social Sciences
SS	South Sudan
TZ	Tanzania
UG	Uganda
ZM	Zambia

ABSTRACT

Enterprise Resource Planning (ERP) is an integrated and large enterprise information system, that provides effective management of cost, improved business operations, growth, and supports business processes across the company. ERP links up the operations of the business which improve coordination and success of an organization. In spite of these benefits, ERP systems have not been fully implemented in most organizations. The purpose of this study was to determine the Critical Success Factors (CSF) for the successful ERP implementation at Hass Petroleum Group. The study was guided by the following research objectives; to identify the critical success factors in successful ERP implementation at Hass Petroleum Group and determine the extent to which the identified critical success factors influenced successful ERP implementation at Hass Petroleum Group. Primary data for the study was collected using an online questionnaire that was sent to all the staff of Hass Petroleum in all countries. There were ninety-nine (99) respondents out of one hundred and fifty-six (156) staff, which translated to sixty three percent (63%) of the population. The study established that project management is a key success factor in ERP implementation at Hass Petroleum. User involvement in all stages of the implementation is also a key success factor in ERP Implementation. Since ERP projects require adequate funding and resource allocation, sustained top management support is a key success factor. It is also very critical that there's open communication channels at all levels in the organization. The change management process and business process engineering was also found to be a critical success factor in ERP implementation at Hass Petroleum. Another Critical success factor is organization culture. Suitability of hardware and how the vendors and consultants support the project is also very critical to the success of ERP implementation. The other critical success factor for successful ERP implementation at Hass Petroleum is company-wide commitment. The eight identified critical success factors were further analyzed to determine the extent to which critical factors influenced the successful implementation of ERP at Hass Petroleum. The study established that the critical success factor with the highest extent was adequate support from top management followed by effective project management. Business process engineering was the factor with the third most extent, and it was followed closely by hardware and vendor support. The next factor was open organization culture which was followed by user involvement. Company-wide commitment was the next factor and effective communication was identified to have the least extent on the successful implementation of ERP at Hass Petroleum.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Enterprise resource planning (ERP) is a complex and large enterprise information system, that provides effective management of cost, improved business operations, growth, and supports business processes across the company (Tsai, Chen, Hwang, & Hsu, 2010).

The usage of ERP by companies around the globe is increasing however, several important factors have to be taken into account for the successful implementation of any ERP system. According to Petter, DeLone, and McLean (2008), an ERP system is a tool for managing procedures and resources; therefore, it is essential for enterprises to have this tool to aid the coordination of several activities within the enterprise. Levi and Doron (2013) claimed that organizations consider ERP to be a vibrant tool for the success of a business because it integrates different business functions and enables accurate transactions and productions.

A successfully implemented ERP system is that which was implemented correctly, at the cost which the company had budgeted, using the resources which the company had planned for, and is meeting the requirements that had been specified (Abu-Shanab Emad, Abu-Shehab Rasha, & Khairallah, Mousa (2015). An ERP which is successfully implemented would soon begin to give the management the benefits they had planned for so that they can have more competitive advantages that they had in mind when the decision to implement the system was made. The critical success factors (CSF) are the few important areas in which a corporate must obtain favorable results so as to ensure the performance of the company is productive.

This study was anchored on IS Success model developed by DeLone and McLean's (2003) and ITPOSMO model developed by Heeks, Mundy and Salazar (1999). DeLone and McLean (2003) updated IS success model is made up of six interdependent measures of information system success that is quality of information from the system, quality system of the system processes and quality of service (support), the intention to use, user

satisfaction from using the system, and benefits of using the system. This model is relevant to this study because we're measuring success factors in an information system implementation. ITPOSMO is an abbreviation for Information, Technology, Processes, Objectives and values, Staffing and skills, Management Systems and structures, and Other resources. According to Heeks, Mundy and Salazar (1999) these factors are related to information system success and failure. This model is important to the study because in ERP implementation the organization changes from a current system (reality) to a new system (design), and hence the gap between the current system and the new system can be expressed using the factors identified by the model.

1.1.1 Enterprise Resource Planning

An ERP system is an information system that is used to integrate all the business functions of a company. It supports the business processes of all departments in an enterprise. It enables the management of an enterprise in which it has been implemented to plan as well as manage its scarce resources (Turban, McLean, & Wetherbe, 2003). It is made up of modules supporting functional areas like strategic planning, human resource time management, marketing, accounting and general book keeping, manufacturing, selling and distribution, management of finances, inventory, projects and transportation among others (Al-Hadi & Al-Shaibany, 2017). ERPs are enabling and enhancing internal and external environmental integration of information.

These systems contribute to the efficiency of companies by integrating resource management, process automation and optimizing information flow. When effectively implemented and applied, the ERP can assist management in many methods, but its implementation is by no means easy (Morton et Hu, 2008). Bernroider et al. (2014) declare that the implementation of an ERP system is tough and does not always succeed. Many companies are not well prepared for implementation of ERPs, so they end up in a failed implementation, partial successful implementation and some even abandon the project.

Esteves-Souza et Pastor-Collado (2000) observed that the ERP implementation has been studied and researched widely by many researchers and scholars. They indicated that its

usually common and easy for project managers to focus on cost and technicalities of the ERP and ignore important people or social aspects of implementation like cultural change, early user involvement, and blessings from top management.

1.1.2 Critical Success Factors for successful ERP Implementation

Rockart (1979) defined the CSFs as the few areas in which satisfactory results would lead to success in competitive performance for the enterprise. When applied to ERP implementations, Holland and Light (1999) defined CSF as the factors that would lead to success in the implementation of ERP. Rockart (1979) observed that focusing on CSF often leads a business to achieve better and satisfactory results and hence ensure that the company is more productive.

Bullen et Rockart (1981) observed that the CSF set is quite small, but of great influence to the ERP implementation; and hence managers should endeavor to focus their attention to them. Hence the term CSF is suitably chosen for it represents the collective factors that are essential to the successful implementation of management projects in the enterprise. Hoorn (2016) notes that the CSF set is specific to business type and that each factor has varying importance to each phase of the project, hence the set of factors are dynamic. Therefore, scholars researching on the ERP implementation success factors and other areas, drew to a conclusion that the factors are not universal and that they would change depending on the project type.

Factors that have been found to influence implementation of ERP by different studies include: support from top management, business plan of the company and its vision, effective team communication, project management techniques, use of a project champion, appropriate legacy systems, change management program, organization culture, business process re-engineering, minimal customization, software testing, monitoring and evaluation of performance, companywide commitment, education and user training, user involvement, support from suppliers, employee competency, suitability of infrastructure, data accuracy, ERP teamwork and composition

1.1.3 Hass Petroleum Group

Petroleum industry in Kenya provides accounts for approximately 75% of all energy needs in the country, and hence it's a very important industry in the economy of this country. The oil marketing and distribution sector is comprised of fifty-three firms (PIEA, 2018). Oil marketing firms like Hass petroleum import and market petroleum products in the country.

Hass petroleum is an oil marketing company that operates in the regions of Eastern Africa and the Great lakes. They have full operations in Tanzania, Rwanda, Uganda, Somalia, South Sudan, Kenya, DRC and Zambia. Their main business is selling and distributing white oils, lubricants and liquefied petroleum gas. Due to the rapid expansion of the company in the range of products, as well as regionally, Hass made a strategic decision to implement Oracle E-business Suite ERP in the year 2012 to replace SAGE, which the company has used for 9 years. The implementations took a phased approach and the last country was successfully implemented in 2017 (Hass Petroleum Group, 2018). This study therefore seeks to determine the critical success factors for the successful implementation of ERP at Hass Petroleum Group.

1.2 Research Problem

According to Uwizeyemungu and Raymond (2012), an ERP increases efficiency and effectiveness in operational processes. ERP links up the operations of the business which improve coordination and success of an organization. In spite of these benefits, ERP has not been fully implemented in most organizations (Munyoroku, 2014). As with many ERP implementations, implementation of ERP in Hass petroleum was a challenging task. Only two countries were completed successfully in the first phase even though implementation started in three countries at the same time.

Several studies have been undertaken on the factors that affect ERP systems implementation across the world. For instance, Sayegh (2010) examined these factors in the context of firms based in the United Arab Emirates by looking at the scope of systems, top management support, employee competency and expectations. The findings indicated that misalignment of expectations and limited management support negatively affected

ERP implementation. In another study, Jayawickrama and Yapa (2013) examined the factors from the perspective of client and consultants where the product selection procedure, project planning, client commitment, competency of consultants and communication of support requirements during the pre-implementation stage were identified as key factors.

Umar, Khan, Agha and Abbas (2016) looked at factors affecting ERP implementation quality in Pakistan and established that top management involvement and support, project management, change management, education and training, business process re-engineering and vendor management constituted key factors in ERP implementation. These studies though focused on factors affecting ERP implementation, they were carried out in a different economy and setting from those in which Hass Petroleum Group operates in hence limiting the application of their findings in the context of Hass Petroleum Group.

In Kenya, Munyoroku (2014) examined the factors that affected ERP implementation among mobile communication firms where four factors: employee knowledge and skills, top management support, project team and organizational goals and objectives were found to have the greatest influence. In another study, Panga (2014) examined factors affecting ERP implementation at the Geothermal Development Company where it was established that top management leadership, organizational culture and user feedback management had the greatest influence. Ndege (2016) focused on the insurance sector where tactical factors, cultural factors and strategic factors affected ERP implementation.

Each of the studies has varying factors influencing ERP implementation, meaning that a specific set of CSFs may not be applicable to another organization or industry. This therefore creates a gap in the case of Hass Petroleum group which this study sought to fill by answering one research question: what were the critical success factors (CSF) for successful ERP implementation at Hass Petroleum Group?

1.3 Research Objectives

The study was directed by the following objectives:

i. To identify the critical success factors in successful ERP implementation at Hass Petroleum Group

ii. To determine the extent to which the identified critical success factors influenced successful ERP implementation at Hass Petroleum Group

1.4 Value of the Study

The findings from this study would be beneficial to the management of Hass Petroleum and other petroleum companies in Kenya, Government of Kenya in formulation and implementation of policies and guidelines on information technology application in businesses and the entire fraternity of researchers and scholars.

The findings from this study would also be valuable to the Government of Kenya especially the Ministry of information, Communication and technology and the Ministry of energy in formulation and implementation of policies that promote the implementation of ERP systems among petroleum marketing firms. This would help improve the development of policies and regulations that would result into ERP implementation among oil marketing firms.

The findings from this study would also be of benefit to future scholars and researchers in that it would increase the available literature on ERP implementation. By capitalizing on limitations of the current study, future scholars would be able to carry more studies on ERP implementation. The study would also contribute to growth on information of ERP implementation by suggesting areas in which future scholars and researchers can pay attention to. This would provide direction on future discourse in ERP implementation.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents past studies together with theories related to ERP implementation. The chapter aims at identifying what other researchers have concentrated on, their findings and how well their studies inform the path that the current study is to take. The chapter starts off with a presentation on the theoretical foundations. The critical success factors in ERP implementation are also presented. The conceptual framework and chapter summary are also presented and discussed in detail.

2.2 Theoretical Foundation

This section presents a number of models on which the study anchors. Specifically, two models are discussed: DeLone and McLean's Information Systems Success Model and ITPOSMO Model. These models are discussed in detail below:

2.2.1 DeLone and McLean's Information Systems Success Model

DeLone and McLean (1992) reviewed research studies undertaken between 1981 and 1987 and came up with a model commonly known as the DeLone & McLean IS success model or simply, DeLone & McLean model for measuring IS success.

Six constructs consisting of the quality of the system, quality of the information, usage of the system, satisfaction of the user, how the individual is impacted by using the system, and how the organization is impacted from using the system were identified as being critical to measuring the success of information systems. According to DeLone and McLean (1992, 2003), most ICT systems are characterized by system quality and information quality.
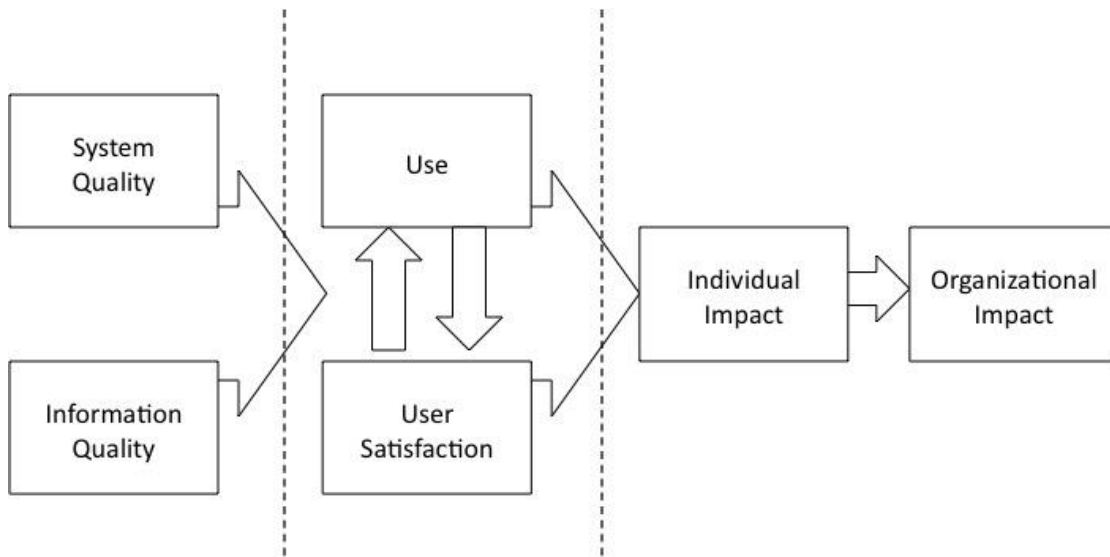
Figure 2.1: Information Systems Success Model (DeLone & McLean 1992)

Many years after their first model publication, and after evaluating many contributions made to it, DeLone and McLean proposed a modified IS success model (DeLone & McLean 2002, 2003). The new model contains six interdependent measurements of success: system, service and information quality, use or intention to use, users' satisfaction and net benefits. Relations between the success dimensions are demonstrated by arrows.

The new model can be understood as follows: Any system can be analyzed in terms of the quality of its information (outputs), system (processes), and service (from vendors); which affects the subsequent use of the system by the end users. This in turn leads to more user satisfaction. The company would benefit from using the information system which would also influence the how the users would be satisfied and subsequent further use of the information system (DeLone & McLean, 1992). This model is relevant for this study because it would be used to retrieve the critical success factors in the implementation at Hass petroleum which could fall into the categories of system quality, information quality, service quality, and perceived benefits of the ERP.
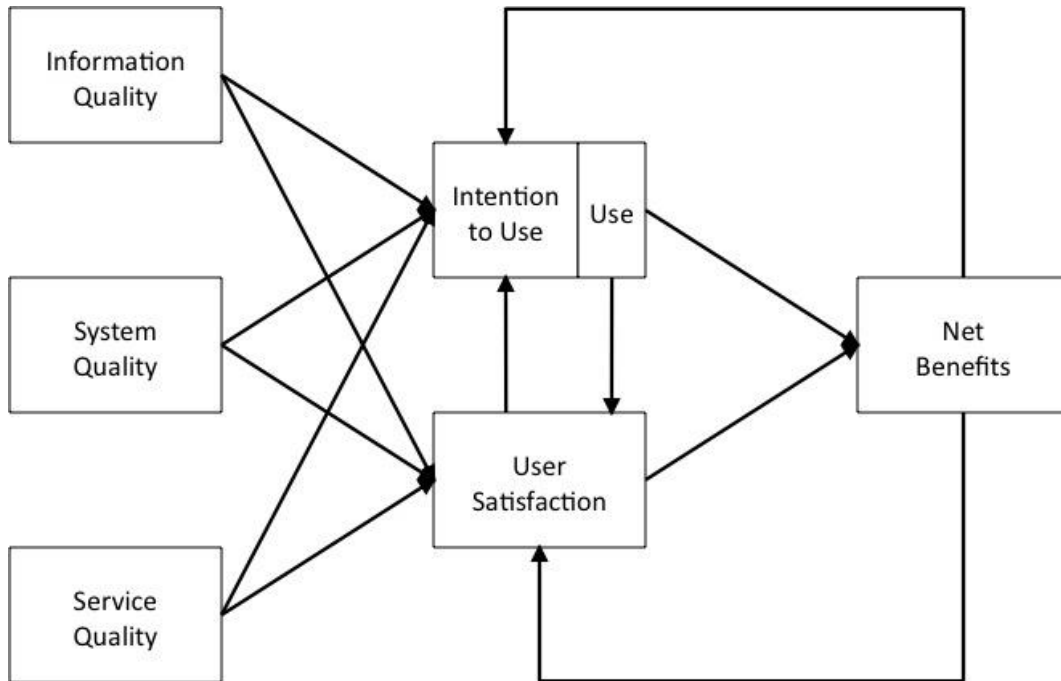
Figure 2.2: Updated Information Systems Success Model (DeLone & McLean 2002, 2003)

2.2.2 ITPOSMO Model

According to Heeks, Mundy and Salazar (1999) ERP success and its failure can be related to specific factors that have been identified in the model that sought to illustrate the gaps between concept and reality for each of the factors. The framework argues that there's a risk of failure when the amount of changes between the current realities and the design conception of the ERP increases. The model is sometimes simply referred to the design – reality gap model: the degree of fit between the design of the proposed system and the current system which is to be replaced. According to Heeks, Mundy and Salazar (1999) the larger the gap between design and reality, the higher the risk of IS implementation failure, and when the gap is small the higher the chances that it would be successful.

Heeks, Mundy and Salazar (1999) identified seven dimensions of the model: information (which are the factors that relate to the quality of inputs and outputs), technology (how compatibly and what is the availability of the existing hardware and software), processes (are current business processes aligned to the design of the new system), objectives and

values (e.g what is the organization culture, and values), staff skills (are skilled personnel available, can they be trained), management and structures (how flexible is the structure and what is the managerial practice), other resources (e.g. financing and time)

Information   ⟷   Information

Technology   ⟷   Technology

Processes   ⟷   Processes

Objectives and values   ⟷   Objectives and values

Staffing and skills   ⟷   Staffing and skills

Management systems and structures   ⟷   Management systems and structures

Other resources   ⟷   Other resources

Reality ⟵   ⟶ **Design**

Gap
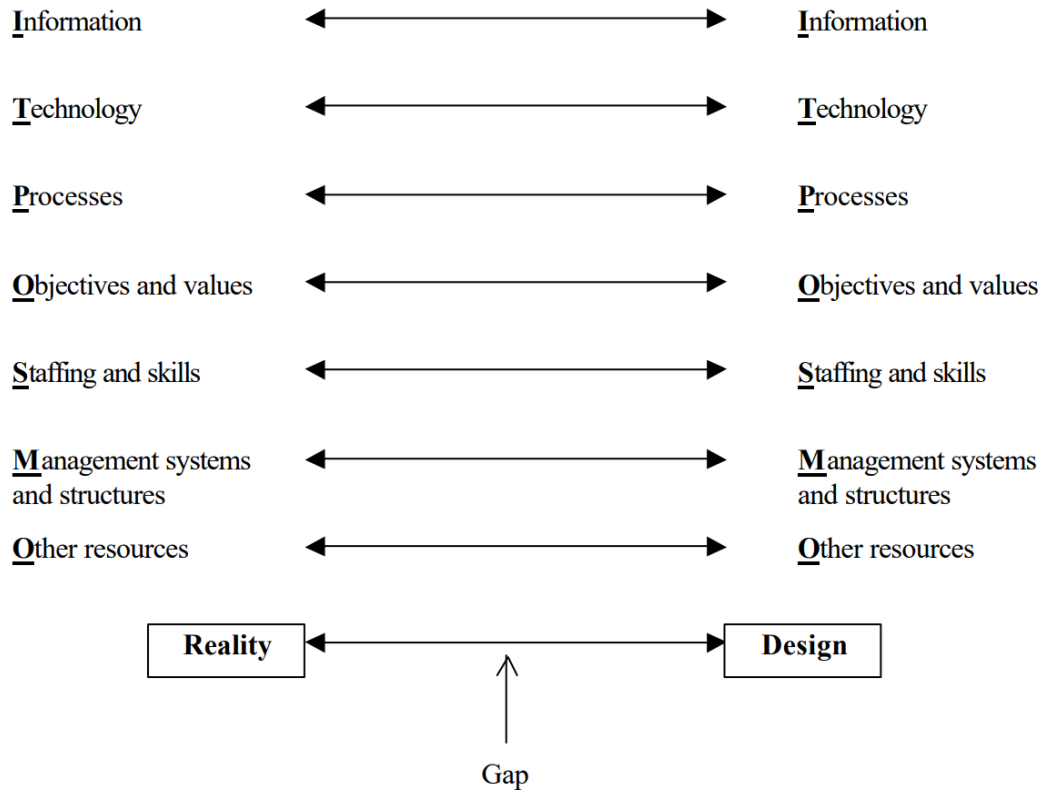
Figure 2.3: Design – reality gap - ITPOSMO Model (Heeks, Mundy and Salazar 1999)

This model was relevant to this study because it would assist in understanding in depth why ERP implementation outcome at Hass Petroleum.

2.3 Critical Success Factors for ERP Implementation

Kiarie (2013) did a study to determine the critical factors influencing the firm to adopt ERP systems. Specifically, the study focused on SMEs in Kenya. The design adopted was descriptive. The population comprised of 4560 SMEs and out of these, 87 was sampled. The study established that availability of resources; support from top management and the ability of employees in an organization to accept change significantly influence the

adoption and implementation of ERP. The study revealed that top management also formulates policies and strategies that would be of good help during the implementation of enterprise resource planning. This implies that if the enterprise resource planning lack support from the top management, the chances of it succeeding are limited. Therefore, top management is required to fully support and give attention to the development and implementation of enterprise resource planning so as to encourage team work and improve future performance of the organization. The study however was limited to SMEs and did not focus in the energy and petroleum firms resulting into a contextual gap for the current study to fill.

Maditinos, Chatzoudes and Tsairidis (2011) examined the factors influencing effectiveness in implementation of ERP. The study was done among companies in Greek. In total, 361 companies were covered. The study established that seeking the services of external consultants during ERP implementation plays an important role hence increasing efficiency. The study established that existence of communication channels that are clear enough also enhances efficiency during ERP implementation. The study further established that organizational culture affects the implementation of successful enterprise resource planning in different ways. The success of enterprise resource planning depends on the congruence between the host culture and the enterprise resource planning culture. The implementation of enterprise resource planning can be fragmented because of internal enterprise culture which represents the societal culture. Crossing of cultural borders takes a new dimension in the implementation of enterprise resource planning. The study focused on Greek firms and not in the regions that Hass petroleum operates hence creating a contextual gap.

While focusing in the post implementation stage, Ha and Ahn (2014) examined the factors influencing performance of Enterprise Resource Planning (ERP) systems in the post-implementation stage. The study established that managerial support, organizational culture and availability of resources significantly influence performance of the ERP after it has been implemented. The study revealed that consultant competency provides useful information that is used in making valid decisions concerning the implementation of the

enterprise resource planning. Generally, a consultant manager is required to engage in giving advice to the external view of the company's techniques and practices so that the needs can be outlined in the enterprise resource planning. This study however focused on performance rather than ERP implementation creating a conceptual gap.

In the banking sector, Alkhaffaf, Jarrah, Karadsheh and Alhawari (2018) did a study to determine the success factors in ERP implementation. The study was done in Jordan. The study revealed that a communication plan entails laying out basic strategies that detail how communication would be executed successful in any given project including the implementation of enterprise resource planning. A good communication plan brings team-wide trust and success towards the implementation of organizational projects. A good communication strategy determines key players to be involved in project execution and discusses task dependencies and determines whether they would be achieved or not. A communication plan also needs to be flexible so that it can adjust to the demands of the users. The study also indicated that consultant competency is very important because it has effect on performance improvement of consulted projects including the enterprise resource planning. The study was limited in the banking sector and not the petroleum industry resulting into the contextual gap.

In India, Rajan and Bara (2015) looked at the factors influencing the usage of ERP. The study established that organizational support, training, and compatibility have a positive influence on ERP usage which in turn has significant influence on panoptic empowerment and individual performance. The study however focused on ERP usage rather than implementation hence a conceptual gap. The study established that the top management makes decisions that affect the entire performance of the organization and incase of any success or failure, it would be held responsible. Leadership and management support influences all the aspects of procurement performance which ranges from the implementation of new systems to the improvement of transparency. The study also focused on in India and not in any of the areas of operation for Hass petroleum hence creating a contextual gap.

While focusing on firms in China and Pakistan, Khattak, She, Memon, Syed, Hussain and Irfan (2013) looked at the critical success factors in ERP implementation. The study established that enterprise resource planning requires a proper team selection and pursuance of project managers in specific areas of its life cycle so as to ensure that the implementation process is well taken care off to avoid disastrous consequences. It was further established that competency in an organization can be measured through annual appraisal, analysis of key performance indicators, 360-degree feedback questionnaire and regular one-to-one meetings with a line manager. Employee competence increases the level of organizational performance and helps the organization meet its set goals and objectives which include successful implementation of projects such as enterprise resource planning. The study focused on China and Pakistan and hence creating a contextual gap that the current study sought to fill.

Vandit (2016) looked at the factors affecting the Implementation of ERP in Indore Region. It was revealed that addressing the necessary changes and needs of the people ensures that the system deployed meets the requirements of the overall strategy of the business and the success of its employees. Project management ensures that enterprise resource planning is implemented as required and that it meets the needs and expectations of the target consumers and the set goals of the organization. It should be noted that project management plays a key in the entire life of enterprise resource planning by ensuring that proper decisions are made concerning the implementation and completion of the whole system. This study focused in Indore region and not on areas that hass operates hence resulting into a contextual gap.

In the SME subsector, Ahmad and Cuenca (2013) did a study on critical success factors for ERP implementation. The study established that strategic project management has played a great role in bringing a positive impact in enterprise resource planning. Project management enables success of enterprise resource planning by detecting the need for change in the whole organization and servicing the need with the necessary materials and resources. The study established that organization culture involves the experiences, philosophy, expectations of the organization and the values that guide the behavior of the

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employees. It includes the norms, values, symbols, systems, language, assumptions, habits and beliefs. Organizational culture can affect the successful implementation of an enterprise resource planning system in any business organization or institution. The study however was done in SME subsector and not the energy sector resulting into a contextual gap.

2.4 Conceptual Framework

Factors in ERP Implementation

- A project champion with the responsibility to drive success of the ERP project
- Accurate estimation of effort required to complete project tasks
- Adequate budget allocation to fund the ERP implementation project
- Adequate communication between internal groups and external groups (vendors and consultants)
- Adequate documentation of the ERP system
- Advance planning for migration and cleaning up data
- Advertisement of the project progress to the entire organization
- Alignment of the business process to fit the ERP system processes
- Appropriate addressing of users concerns
- Appropriate recommendations from consultant and vendors on what hardware was most suitable
- Approval of the ERP implementation by top management
- Clear definition of the business units being affected by the implementation
- Clear determination of the critical path of the project
- Clear identification of all project tasks
- Co-location of the project team members to work at a central location
- Commitment to meeting of project deadlines
- Top Management communicating IS policy information, project priorities and the selection process to users
- Communication of expectations at all levels in the organization
- Compensation and incentives to the team pegged on project deliverables within budget and timeframe
- Constant tracking of budgets
- Constant tracking of schedules
- Employee's strong willingness to accept the new ERP
- Employees being made to understand what is being changed and the reasons why it is being changed
- Experience in ERP implementation by the consultant
- Formal promotion of the project team by management
- Frequent communication to project team and users
- Full time assignment of team members to the implementation
- Identification and definitions of all project milestones
- Identification of the business processes that needs to be changed to align to the ERP
- Involvement of users in the stages of definition of the company's ERP system needs
- Management giving staff ample time to do project activities
- Management's involvement in setting up a competent and capable ERP project team
- Management's strong commitment to use the ERP system for achieving business aims
- Mix of consultants and internal staff in the project team
- Open communication channels between users and IS personnel
- Participation of users in ERP training
- Participation of users in testing the ERP
- Participation of users in the implementation of the ERP system
- Project team members experience in ERP implementation
- Project team's familiarity of the business functions and products
- Proper management of escalation of project issues
- Proposed system modifications being evaluated against business benefits
- Quick response to system problems and user issues
- Rewarding of project team for successful project milestones
- The ERP closely fitting the user requirements
- The ERP's compatibility with most of the existing hardware
- The hardware selection decisions based on the ERP systems' requirements
- Top management involvement in all stages of the project
- Top management's intervention in resolving conflicts arising during implementation
- Top management's public and explicit identification of the ERP project as a top priority
- User's assurance that their jobs were secure and will not be eliminated after successful ERP implementation
- Users being allowed to air their requirements, comments and reactions regarding the ERP
- User's participation in project selection
- Willingness from management to allocate resources to the implementation project
- Willingness to change some business processes so as to avoid a lot of customization on the ERP

→ **Successful Implementation of an ERP**

Figure 2.4: Conceptual framework

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2.5 Chapter Summary

The chapter has reviewed literature on factors affecting enterprise resource planning implementation. Tarhini, Ammar and Tarhini (2015) assessed the analysis of critical success factors for enterprise resource planning implementation from stakeholders' perspective. The study limited itself to the perspective of the stakeholders only hence making it not to be applicable to other users. The study however used the case of HASS petroleum group. The study only focused on HASS petroleum group. The study was done in the petroleum sector. Its findings were therefore only limited to petroleum sectors.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the methodology used in the study. It focuses on research design, study population, the instrument of data collection, and methods used in analyzing the data.

3.2 Research Design

The study used a descriptive research design. A descriptive design is mainly concerned with aspects relating to what, where, when, which and whom of a phenomenon. It explains how things exist in their original state. This design was appropriate for the study because the researcher was at a position to establish the critical success factors for successful ERP implementation at Hass Petroleum.

3.3 Population of the Study

Hass Petroleum group has a total of 156 employees who formed the population of the study. Since the population of Hass is less than 200, census was preferred. According to Mugenda and Mugenda (2003) when the population is too small, census is the most preferred method. Table 3.1 shows the distribution of the staff by department and country and it can be further seen that some departments in some countries had no staff which was another basis to conduct a census.

Table 3.1: Distribution of population by country

	KE	UG	RW	TZ	ZM	DRC	SO	SS	Total
Information Technology	7	1	0	1	0	0	3	0	12
Human Resource	3	1	0	1	0	0	2	0	7
Marketing	10	4	2	3	2	2	6	2	31
Supply and Operations	3	4	1	3	1	1	3	1	17
Finance	11	8	1	4	2	1	31	1	59
Engineering	2	0	0	1	0	0	1	0	4
Procurement	5	2	0	2	0	0	2	0	11
Legal	2	0	0	0	0	0	0	0	2
Audit	3	0	0	0	0	0	0	0	3

	KE	UG	RW	TZ	ZM	DRC	SO	SS	Total
Customer Care	2	0	0	1	0	0	7	0	10
Total	**48**	**20**	**4**	**16**	**5**	**4**	**55**	**4**	**156**

3.4 Data Collection

The study used primary data that was collected using structured online questionnaires and interview were conducted for senior management. The questionnaire was divided into sections covering company information and the critical success factors influencing implementation of ERP. The questionnaire was structured on five-point Likert scale where 1=no extent and 5=very large extent. The researcher then sent the link of the online questionnaire by email to all staff of Hass Petroleum, because the staff are in different countries. The responses were updated on a real time basis as the staff filled the questionnaire from different locations.

3.5 Data Analysis

The collected data was downloaded from google forms in excel format and coded into SPSS for analysis. Exploratory Factor Analysis was used to extract the critical success factors for a successful ERP implementation at Hass Petroleum. This was based on Eigenvalues and communalities. The data collected from the interviews conducted for senior management was analyzed using content analysis because it was qualitative in nature. This information was used to complement and validate the critical success factors that had been extracted using factor analysis.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the findings of the study. It presents the data analysis and discussions of the findings in accordance with the objectives of the study.

4.1.1 Response Rate

Questionnaires were administered online using google forms. The link to respond to the questionnaire was sent to all staff of Hass Petroleum in all countries. Ninety nine responses were received which represented response rate of 63%. Mugenda and Mugenda (2003) indicated that a 50% response rate is adequate for analysis, while 60% is good and 70% or above is excellent. Hence the response rate of 63% was considered to be good.

4.2 Demographic Information

This section presents the demographic information of the different countries which includes, the country in which the respondent is located, the duration that the company has been in operation in that country, and the duration in years that the company has been using the ERP in that country.

4.2.1 Distribution of respondents by country

Respondents were requested to indicate the country in which they are stationed; the findings are as shown in Table 4.1.

Table 4.1: Distribution of respondents by country

Country	Frequency	Percent
DRC	3	3.0
Kenya	28	28.3
Rwanda	2	2.0
Somalia	40	40.4
South Sudan	3	3.0
Tanzania	7	7.1
Uganda	12	12.1
Zambia	4	4.0
Total	**99**	**100.0**

The findings show that majority of the respondents were from Kenya and Somalia. This is consistent with the high population distributions in these countries. This can be interpreted to mean responses are a fair representation of the population.

4.2.2 Distribution by number of years the company had been in operation

Respondents indicated the length their company had been in operations in the country, the findings are as shown in Table 4.2.

Table 4.2: Distribution by number of years the company had been in operation

Years of operation	Frequency	Percent
1 – 5 years	25	25.3
6 – 10 years	27	27.3
11 – 15 years	15	15.2
over 15 years	32	32.3
Total	**99**	**100.0**

The findings show that the company had operated for more than 5 years. This can be interpreted to mean that the company has been in operation for many years.

4.2.3 Distribution by number of years Oracle ERP had been in use

Respondents indicated how long in terms of years Oracle ERP has been in use in the organization. The findings are as shown in Table 4.3.

Table 4.3: Distribution by number of years Oracle ERP had been in use

Years of using Oracle	Frequency	Percent
1 year or less	4	4.0
2 years	17	17.2
3 years	19	19.2
over 3 years	59	59.6
Total	**99**	**100.0**

This can be interpreted to mean that Oracle ERP implementation had been well adopted since it had been in use for more than 3 years in majority of the countries.

4.3 Critical Success Factors for ERP Implementation at Hass Petroleum Group

This section addresses the first objective of the study which is to determine the critical success factors for successful ERP implementation at Hass Petroleum. The study used 55 indicators that the respondents were asked to rate the extent to which each indicator had influenced successful ERP Implementation at Hass Petroleum.

Because the variables were many, the study used factor analysis to reduce them into few categories or factors based on the correlation between the variables.

The Kaiser-Meyer-Olkin of sampling adequacy (KMO-test) was used to check whether the data collected represented a big enough sample. According to Filed (2000) the sample is adequate if the value of KMO is greater than 0.5. The findings showed a value of 0.891 for KMO-test, which is greater than 0.5 and hence the data was deemed adequate for the study.

4.3.1 The Correlation Matrix

In correlation matrix variables, the existence of clusters of large correlation coefficients between subsets of the variables suggests that the variables could be measuring aspects of the same underlying dimension or factors (Field. 2000). The correlation matrix revealed that there were a few clusters of variables with high intercorrelations represented, which according to Rietveld and Van Hout (1993) could indicate that they are manifestations of the same underlying variable. Thus, data from the correlation matrix was used to group the variables into eight factors.

4.3.1 The Communality

Communalities are used to show the amount of variance in each variable that is accounted for. The initial communality are estimates of the variance in each variable accounted for by all components or factors. The initial communalities value for this study are all 1 because principal component analysis method was used for extraction. An Extraction of communalities was done to show the estimates of the variance in each variable accounted for by the components. The communalities findings are shown in Appendix III. The communalities for this study were all more than 0.5, which indicates that the extracted components represent the variables well.

4.3.3 Factor Extraction

Linyiru (2015) stated that an Eigen value of 1 or more indicates a unique factor. Factor extractions allows the researcher to retain the factors with Eigen values of more than 1 and so for this study factors that had an Eigen value of more than 1 were retained and the ones with an eigen value of less than 1 were left out. Only eight factors were considered significant as shown in Appendix IV.

4.3.3 The Scree Plot

The scree plot confirms that only eight factors have been selected. This is a plot of the Eigen values against the component or factor numbers. The point of inflexion of the curve indicates the number of factors considered significant for the study hence only factors to the left of the inflexion point or elbow point have been kept.
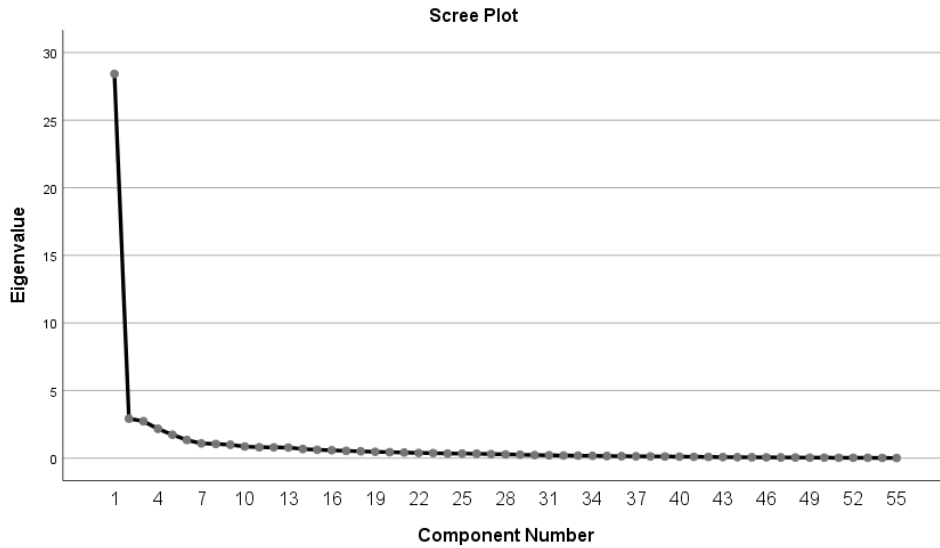
Figure 4.1: The Scree Plot

4.3.4 Factor Matrix

The study used SPSS to calculate the loading on each factor. This helped to identify how closely the variables were related with each of the eight factors discovered. The findings are as shown in the rotated component matrix in Table 4.4.

Table 4.4: Rotated component matrix

Factor number	Indicators	Component							
		1	2	3	4	5	6	7	8
40	Project team members experience in Oracle implementation	0.80	0.17	0.12	0.05	0.11	0.19	0.15	-0.04
41	Project team's familiarity of the business functions and products	0.76	0.18	0.35	0.07	0.22	0.03	0.05	-0.13
33	Identification of the business processes that needs to be changed to align to Oracle	0.75	0.19	0.23	0.23	0.17	0.08	0.03	0.17
37	Co-location of the project team members to work at a central location	0.73	0.22	0.26	0.25	0.03	0.06	0.11	0.18
31	Constant tracking of schedules	0.71	0.17	0.23	0.21	0.25	0.01	0.07	0.22

Factor number	Indicators	Component							
		1	2	3	4	5	6	7	8
32	Identification and definitions of all Oracle project milestones	0.71	0.21	0.15	0.16	0.20	0.07	0.17	0.28
29	Clear identification of all project tasks	0.65	0.13	0.18	0.05	0.27	0.24	0.16	0.15
36	Proposed system modifications being evaluated against business benefits	0.64	0.22	0.22	0.14	0.40	-0.04	0.05	0.07
35	Proper management of escalation of project issues	0.61	0.37	0.23	0.26	0.06	0.27	0.17	0.03
34	Commitment to meeting of project deadlines	0.61	0.22	0.30	0.37	0.01	0.32	-0.07	0.00
38	Mix of consultants and internal staff in the project team	0.59	0.36	0.05	0.16	0.18	0.20	0.23	-0.06
55	Experience in Oracle implementation by the consultant	0.55	0.40	0.28	0.21	0.26	0.10	0.36	-0.05
42	Full time assignment of team members to the implementation	0.54	0.41	0.29	0.09	0.09	0.22	0.20	0.23
54	Quick response to system problems and user issues	0.53	0.35	0.35	0.23	0.02	0.04	0.40	-0.06
27	Clear definition of the business units being affected by the implementation	0.52	0.19	0.27	0.02	0.42	0.26	0.25	0.12
43	Appropriate addressing of users concerns	0.52	0.43	0.35	0.16	-0.02	0.22	0.09	-0.10
39	Compensation and incentives to the team pegged on successful implementation on time and within the assigned budget	0.51	0.31	-0.11	0.44	0.21	0.31	-0.13	0.02
49	Adequate documentation of Oracle was available	0.50	0.48	0.28	0.09	0.22	0.10	0.25	-0.01
28	Clear determination of the critical path of the project	0.48	0.21	0.24	0.07	0.42	0.08	0.25	0.36
48	User's participation in project selection	0.21	0.75	-0.11	0.34	0.07	-0.02	0.03	0.22

Factor number	Indicators	Component							
		1	2	3	4	5	6	7	8
44	Involvement of users in the stages of definition of the company's system needs	0.34	0.73	0.19	0.20	0.15	0.13	-0.07	-0.03
47	Participation of users in the implementation of Oracle system	0.30	0.71	0.33	0.05	0.04	0.24	0.12	0.03
50	The Oracle system was closely fitting the user requirements	0.22	0.70	0.11	0.10	0.40	-0.03	0.22	0.08
46	Participation of users in testing the Oracle system	0.37	0.66	0.21	0.06	0.08	0.35	0.14	0.05
22	User's assurance that their jobs were secure and will not be eliminated after successful Oracle implementation	0.16	0.63	0.09	0.26	0.30	0.19	0.00	0.30
45	Participation of users in Oracle training	0.33	0.57	0.32	0.12	0.20	0.35	0.15	0.10
52	The hardware selection decisions based on Oracle systems' requirements	0.34	0.45	0.31	0.42	0.05	0.12	0.32	0.00
2	Approval of the Oracle implementation by top management	0.23	0.15	0.80	-0.03	0.11	0.03	0.20	0.02
8	Top management's public and explicit identification of the Oracle project as a top priority	0.28	0.21	0.76	0.11	0.15	0.15	-0.02	0.23
9	Willingness from management to allocate resources to the Oracle implementation project	0.20	0.13	0.69	0.19	0.21	0.28	0.14	0.02
21	Management's strong commitment to use Oracle system for achieving business aims	0.36	0.14	0.65	0.23	0.24	0.09	0.07	-0.01
4	Management's involvement in setting up a competent and capable Oracle project team	0.41	0.16	0.63	0.15	0.05	0.15	0.11	0.35
13	Communication of expectations at all levels in the organization	0.25	0.14	0.56	0.53	0.19	0.15	0.04	0.01

Factor number	Indicators	Component							
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1	Adequate budget allocation to fund the Oracle implementation project	0.11	-0.07	0.56	0.07	0.16	0.06	0.54	0.08
10	Adequate communication between internal groups and external groups (vendors and consultants)	0.27	0.27	0.45	0.31	0.24	0.12	0.33	0.26
12	Communication of information regarding IS policy, project priorities and selection criteria from top management to users	0.25	0.11	0.31	0.72	0.09	0.00	0.05	0.01
15	Formal promotion of the project team by management	0.12	0.31	0.01	0.67	0.30	0.33	0.12	-0.01
5	Rewarding of project team for successful project milestones	0.01	0.40	0.00	0.56	0.01	0.30	0.03	0.38
30	Constant tracking of budgets	0.51	0.01	0.08	0.54	0.20	-0.06	0.06	0.30
11	Advertisement of the project progress to the entire organization	0.36	0.15	0.24	0.52	0.09	0.10	0.39	0.26
7	Top management's intervention in resolving conflicts arising during implementation	0.14	0.13	0.15	0.50	-0.01	0.50	0.42	0.07
24	A project champion with the responsibility to drive success of the Oracle implementation project	0.34	0.33	0.27	0.42	0.39	0.01	0.11	-0.06
23	Willingness to change some business processes so as to avoid a lot of customization on Oracle	0.20	0.11	0.14	0.35	0.68	0.11	0.24	0.07
25	Accurate estimation of effort required to complete project tasks	0.46	0.22	0.17	0.24	0.59	0.16	-0.01	0.19
19	Alignment of the business process to fit the system processes in Oracle	0.36	0.19	0.32	0.07	0.55	0.25	0.24	-0.08

Factor number	Indicators	Component							
		1	2	3	4	5	6	7	8
26	Advance planning for migration and cleaning up data	0.43	0.21	0.41	0.06	0.53	0.16	0.03	0.10
20	Employee's strong willingness to accept Oracle	0.15	0.48	0.22	0.07	0.49	0.44	-0.04	0.14
17	Open communication channels between users and IT personnel	0.29	0.29	0.29	0.21	0.22	0.63	0.12	0.04
16	Frequent communication to project team and users	0.29	0.22	0.26	0.32	0.34	0.55	0.07	0.27
18	Users being allowed to air their requirements, comments and reactions regarding Oracle	0.24	0.40	0.24	0.00	0.47	0.50	0.04	0.13
14	Employees understanding of what is changing, why it is changing and how it will help the organization	0.13	0.32	0.35	0.26	0.21	0.47	0.32	0.05
53	Appropriate recommendations from consultant and vendors on what hardware was most suitable	0.44	0.15	0.13	0.13	0.23	0.11	0.54	0.19
51	Oracle's compatibility with most of the existing hardware	0.36	0.33	0.29	0.08	0.27	0.20	0.49	0.17
6	Top management involvement in all stages of the project	0.10	0.32	0.47	0.38	0.03	0.12	0.22	0.50
3	Management giving staff ample time to do project activities	0.28	0.17	0.29	0.11	0.29	0.14	0.19	0.49
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. a. Rotation converged in 18 iterations.									

4.3.5 Summary of the Loading of factors

Table 4.5 shows the summary of the loading on factor analysis.

Table 4.5: Summary of the Loading

Factor	Variables
1	27,28,29,31,32,33,34,35,36,37,38,39,40,41,42,43,49,54,55
2	22,44,45,46,47,48,50,52
3	1,2,4,8,9,13,21,10
4	5,7,11,12,15,24,30
5	19,20,23,25,26
6	14,16,17,18
7	51,53
8	3,6

4.3.6 Factor loading and isolation

The finding on factor isolation is as shown in Table 4.6.

Table 4.6: Factor loading and isolation

Factor number	Variable	Factor loading	Underlying factor
40	Project team members experience in Oracle implementation	0.801	Project management
41	Project team's familiarity of the business functions and products	0.764	
33	Identification of the business processes that needs to be changed to align to Oracle	0.748	
37	Co-location of the project team members to work at a central location	0.727	
31	Constant tracking of schedules	0.711	
32	Identification and definitions of all Oracle project milestones	0.711	
29	Clear identification of all project tasks	0.646	
36	Proposed system modifications being evaluated against business benefits	0.639	
35	Proper management of escalation of project issues	0.612	
34	Commitment to meeting of project deadlines	0.610	
38	Mix of consultants and internal staff in the project team	0.588	
55	Experience in Oracle implementation by the consultant	0.553	
42	Full time assignment of team members to the implementation	0.543	
54	Quick response to system problems and user issues	0.530	
27	Clear definition of the business units being affected by the implementation	0.525	

Factor number	Variable	Factor loading	Underlying factor
43	Appropriate addressing of users concerns	0.521	
39	Compensation and incentives to the team pegged on successful implementation on time and within the assigned budget	0.510	
49	Adequate documentation of Oracle was available	0.500	
28	Clear determination of the critical path of the project	0.475	
48	User's participation in project selection	0.746	User involvement
44	Involvement of users in the stages of definition of the company's system needs	0.726	
47	Participation of users in the implementation of Oracle system	0.710	
50	The Oracle system was closely fitting the user requirements	0.700	
46	Participation of users in testing the Oracle system	0.657	
22	User's assurance that their jobs were secure and will not be eliminated after successful Oracle implementation	0.631	
45	Participation of users in Oracle training	0.567	
52	The hardware selection decisions based on Oracle systems' requirements	0.447	
2	Approval of the Oracle implementation by top management	0.798	Adequate top management support
8	Top management's public statement that the Oracle implementation is a top priority project	0.762	
9	Willingness from management to allocate resources to the Oracle implementation project	0.695	
21	Management's strong commitment to use Oracle system for achieving business aims	0.645	
4	Management's involvement in setting up a competent and capable Oracle project team	0.633	
13	Communication of expectations at all levels in the organization	0.558	
1	Adequate budget allocation to fund the Oracle implementation project	0.557	
10	Effective communication between the project team and external groups (vendors and consultants)	0.448	
12	Top management communicating IS policy information, priorities for the project and the process of selection to users	0.716	Effective Communication
15	Formal promotion of the project team by management	0.668	
5	Rewarding of project team for successful project milestones	0.560	
30	Constant tracking of budgets	0.540	
11	Advertisement of the project progress to the entire organization	0.515	
7	Top management's intervention in resolving conflicts arising during implementation	0.497	
24	A project champion with the responsibility to drive success of the Oracle implementation project	0.420	

Factor number	Variable	Factor loading	Underlying factor
23	Willingness to change some business processes so as to avoid a lot of customization on Oracle	0.679	Business process engineering and change management program
25	Accurate estimation of effort required to complete project tasks	0.588	
19	Alignment of the business process to fit the system processes in Oracle	0.553	
26	Advance planning for migration and cleaning up data	0.529	
20	Employee's strong willingness to accept Oracle	0.490	
17	Open communication channels between users and IT personnel	0.633	Organization culture
16	Frequent communication to project team and users	0.551	
18	Users being allowed to air their requirements, comments and reactions regarding Oracle	0.502	
14	Employees were made to understand what is being changed, the reasons for the change and how it would help the organization	0.471	
53	Appropriate recommendations from consultant and vendors on what hardware was most suitable	0.543	Suitability of hardware and vendor support
51	Oracle's compatibility with most of the existing hardware	0.489	
6	Top management involvement in all stages of the project	0.504	Company wide commitment
3	Management giving staff ample time to do project activities	0.490	
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. a. Rotation converged in 18 iterations.			

The first factor is project management; Some of these indicators were as follows; project team members experience in Oracle implementation, project team's familiarity of the business functions and products, identification of the business processes that needs to be changed to align to Oracle, identification and definitions of all Oracle project milestones, proposed system modifications being evaluated against business benefits, clear identification of all project tasks and commitment to meeting of project deadlines. This can be interpreted to mean that Hass Petroleum had a project manager with proper project management skills to lead the Oracle implementation projects. This finding is complemented by the senior management interview finding. The managers revealed that effective project management skills had enabled them to complete the implementation in each country on time and that there was proper allocation of company resources to the project enabling it to be completed at the budgeted cost.

Factor two is involvement of users. Indicators in factor included user's participation in project selection, involvement of users in the stages of definition of the company's system needs, participation of users in the implementation of Oracle system, user's assurance that their jobs were secure and will not be eliminated after successful Oracle implementation and participation of users in Oracle training. This can be taken to mean that the involvement of users was key to successful ERP implementation as it reduces resistance during implementation. Senior management also revealed that the employees actively participated in the data cleanup, data collection and training.

The indicators in factor three pointed towards sustained adequate support from top management. The indicators are as follows; top management's public statement that the Oracle implementation is a top priority project, management's involvement in setting up a competent and capable Oracle project team, management's strong commitment to use Oracle system for achieving business aims, communication of expectations at all levels in the organization and top management involvement in all stages of the project. This means that the project was successful because of adequate support from top management. The management of Hass Petroleum supported the project by adequate resource allocation, and advertisement of the project within the company, which led to the implementation successful. This was confirmed by the interview findings that top management participated in the ERP implementation by attending project meetings and actively monitoring the progress of the implementation. They also revealed that they mobilized for finances and approved resource allocation to the project on a timely basis.

Factor four has a focus on effective communication. The five indicators are as follows; formal promotion of the project team by management, top management's intervention in resolving conflicts arising during implementation, top management communicated the information regarding IS policy, priorities of the project and the selection process to users, rewarding of project team for successful project milestones and advertisement of the project progress to the entire organization. This can be interpreted to mean that there was a proper communication management regarding the ERP implementation, which led to a successful ERP implementation. The interviews conducted for senior management also

complimented this factor by establishing that a proper project communication plan had helped senior management motivate the employees by giving them frequent updates on what was happening, why it was important, and how it would affect them and their jobs. This helped most of the employees in job assurance, which in turn helped to reduce resistance to the implementation. Maditinos, et al. (2011) found out that existence of communication channels that are clear enough also enhances efficiency during ERP implementation

The fifth is business process re-engineering and having a proper change management program. The indicators that supported this factor are willingness to change some business processes so as to avoid a lot of customization on Oracle, alignment of the business process to fit the system processes in Oracle, and advance planning for migration and cleaning up of data. This can be interpreted to mean that there was adequate business process re-engineering which, minimized the number of customizations required and hence was critical in the successful implementation of ERP.

The sixth factor is Organization culture that is open to change. This is indicated by two variables which are employees made to understand what is being changed, the reasons for the change and how it would help the organization, and employees being allowed to air their views about the implementation. This was interpreted to mean that Hass Petroleum employees have an organization culture that is open to change, which proved to be a critical success factor during the implementation of Oracle ERP. This factor is confirmed by the interview findings that revealed that staffs were more open to changing systems and environment, were ready to learn and expand their organization and they embraced changes. This agrees with Ahmad and Cuenca (2013) who indicated that organization culture involves the experiences, philosophy, expectations of the organization and the values that guide the behavior of the employees.

The seventh factor is the suitability of hardware and appropriate support from vendors and consultants. This is indicated by the factors appropriate recommendations from consultant and vendors on what hardware was most suitable, as well as Oracle's compatibility with

most of the existing hardware. This can be interpreted to mean that there was proper quality of service from the vendors and consultants which resulted in proper advise regarding the infrastructure being given. This factor was confirmed by management during the interviews. The finding was that there was adequate support from vendors through the consultant offering proper advice in key processes, responding quickly to issues as required by the senior management. The study also found out that the consultants had some of the customizations ready from previous implementations which saved on the time that would have been required to design, test, and implement the customizations, which consequently led to a shorter implementation time for the ERP.

The eighth factor is company-wide commitment to the implementation. This is indicated by the involvement of management at all stages of the implementation and employees having ample time to carry out project activities. This is interpreted to mean that the project succeeded partly due to the commitment of everyone across the company. This was confirmed by senior management who revealed that employees had actively participated in requirements gathering, training and testing of the ERP. The senior management themselves had also actively participated in the project by attending implementation meetings and monitoring the progress on a regular basis.

4.4 Extent to which the CSFs influenced successful ERP Implementation

This section addresses the second objective of the study which is to determine the extent to which the identified critical success factors influenced successful ERP implementation at Hass Petroleum Group.

The study went further to analyze the extracted critical success factors to find out the extent of influence on ERP implementation. The results are shown in Table 4.7.

Table 4.7: Critical success factors for ERP Implementation

Critical Success Factor	Mean	Standard Deviation
Top management support	4.0808	0.74666
Project management	3.9973	0.73050
Business process engineering	3.9495	0.78316
Hardware and vendor support	3.9444	0.82958
Organization culture	3.9318	0.85849
User involvement	3.9003	0.84004
Company-wide commitment	3.8737	0.76380
Effective communication	3.7879	0.72107

From the findings top management support is the critical success factor which had the greatest extent to the successful implementation of ERP at Hass Petroleum with a mean of 4.080. This is followed by project management with a mean of 3.997, then business process engineering with a mean of 3.949. Hardware and vendor support is the next point shown by a mean of 3.944 which is followed by organization culture with a mean of 3.93 and user involvement with a mean of 3.900. The other factors is company-wide commitment with a mean of 3.873 and the factor with the least extent is effective communication.

This is in line with findings from interviews conducted where senior managers indicated that they adequately supported the ERP implementation by approving and mobilizing for finances and key resources, attending project meetings and frequently monitoring the project. They also properly advertised the importance of the ERP implementation to the whole organization and rewarded the project team for achievement of key milestones. Project Management was also a factor that had a great extent on the successful implementation of ERP which was also consistent with the findings of the interviews that indicated that proper project management and tracking enabled timely completion of the project in each country and ensured proper allocation of project resources.

4.5 Discussions of the Key Findings

The study identified the critical success factors for successful implementation of ERP at Hass Petroleum. The factors were top management support, project management, business

process engineering, hardware and vendor support, organization culture, user involvement, company-wide commitment and effective communication.

The study found out that there was adequate and sustained support from top management during the ERP implementation. This was indicated by the adequate allocation of budget and advertisement of the project in the company. There was adequate and effective communication between internal groups and external groups which ensured that key project issues are addressed on a timely manner and that everyone is updated on project progress. This is in agreement with a study done by Alkhaffaf, Jarrah, Karadsheh and Alhawari (2018) to determine the success factors in ERP implementation in the banking sector which found out that a good communication plan brings team-wide trust and success towards the implementation of organizational projects.

The implementation project team was led by a project manager with proper project management skills. The project manager ensured that the project stayed on track and that milestones were achieved within the planned timelines. He also ensured proper allocation of project resources to project tasks ensuring there is efficiency and no wastage. This is in line with the findings by Khattak, She, Memon, Syed, Hussain and Irfan (2013) whose study established that enterprise resource planning requires a proper team selection and pursuance of project managers in specific areas of its life cycle so as to ensure that the implementation process is well taken care of.

The study also established that there was user involvement in all stages of implementation and staff were made to understand what is being changed, the reasons for the change and how it would help the organization. They also participated in extensive training and requirements gathering. The finding agrees with the study by Maditinos, et al. (2011) which found out that user involvement is a critical factor in ERP implementation and that adequate user involvement reduces employee resistance in all stages of ERP implementation. The study established that staffs were more open to changing systems and environment, were ready to learn and expand their organization and they embraced changes. This agrees with Ahmad and Cuenca (2013) who indicated that organization

culture involves the experiences, philosophy, expectations of the organization and the values that guide the behavior of the employees.

The study established that top management support had the highest extent to the successful implementation of ERP at Hass petroleum. This finding is in agreement with Rajan and Bara (2015) findings that top management makes decisions that affect the entire performance of the organization and in case of any success or failure, they would be held responsible. He established that lack of support from top management alone can make a project to fail. The other factor that had a high extent to successful implementation was project management, which is in agreement with findings by Khattak, She, Memon, Syed, Hussain and Irfan (2013) whose study established that enterprise resource planning requires a proper team selection and pursuance of project managers in specific areas of its life cycle so as to ensure that the implementation process is well taken care of.

CHAPTER FIVE

SUMMARY OF THE FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents summary of the findings, conclusion, recommendation and limitations of the study. Recommendations of the study and suggestions for further studies are also discussed in this chapter.

5.2 Summary of the Findings

This study was guided by two objectives; to identify the critical success factors in successful ERP implementation at Hass Petroleum Group and to determine the extent to which the identified critical success factors influenced successful ERP implementation at Hass Petroleum Group.

Adequate top management support is a critical factor in ERP implementation. Top management should approve, and adequately communicate to all employees that the project is a top priority for the company. Top management should be involved in key project meetings to ensure they are up-to-date with the project and to offer leadership and direction to the project team. Top management should also ensure that there's adequate resource allocation so that the project does not stall due to lack of key resources like financing.

Effective project management of ERP implementations is another key factor influencing ERP implementation success. Good project management skills are key in all stages of ERP implementation projects. It is important to identify all the project milestones, resources, budget, and plan for the time when each milestone should be completed. The project manager should manage key project resources with care to ensure that they are efficiently utilized. Continuous project tracking is essential to ensure that the plan does not go off the track.

User involvement is also a critical success factor in ERP implementation. Involving users from early stages of the project like in requirements definition ensures that they accept the project and hence they will offer more support which leads to success. If the users are not involved in collection of requirements the ERP could end up being implemented in a way that is not useful to them. Proper training of users also ensures that there is less resistance during because employees are more assured of their jobs.

Effective communication among team members is also key, as it ensures that everyone is updated in the direction of the project and their issues are being addressed. It also creates an open communication channel in which users or project team can air their views about the project to management. Other important factors include organization culture that is open to change, business process re-engineering with minimal customization, involving a competent consultant, project champion, proper system testing, and appropriate business and IT legacy system. All these factors arc critical for successful ERP implementation and should be well thought out by any organization or individual who envisages to implement an ERP and succeed.

5.3 Conclusions

The key findings of this study are that certain factors do contribute significantly to the success or failure of an ERP's implementation. The most important factor is adequate top management support, followed by effective project management. Proper business process engineering with minimal customizations on the ERP is also a very critical success factor. Adequate user involvement, effective communication, open organization culture, adequate hardware and vendor support, and company-wide commitment are very important critical success factors which should not be ignored.

5.4 Recommendations

The study recommends that top management ought to provide adequate and sustained support for the ERP projects implementation. This can be through sponsoring them and informing the whole company of the importance of the ERP implementation to the company. Top management ought to allocate adequate resources in form of budget and

staff to implementation projects. The project manager should have proper project management skills to ensure that the project stays on track. Effective project management is also recommended to ensure that project resources are allocated well. Project management will also ensure that critical tasks and deliverables are tracked which will lead to completing key project tasks on time and within budget.

The study also recommends that there should be a proper business process engineering done to align business processes to the ERP processes which will help avoid too much customization. The other recommendation is that any company in the process of ERP implementation should get proper support from hardware vendors to ensure that the hardware infrastructure can support the ERP.

The study also recommends that users should be actively involved in all stages of the ERP implementation. Involvement of users ensures that the new system is accepted across the organization which reduces resistance to implementation in all the stages. Effective communication across the whole organization is also recommended to ensure that everyone knows the importance of the project and is adequately informed of their roles in the project. The other recommendation is an that the organization should have an open organization that is open to changes. This will ensure that there is minimal resistance during the implementation of the project and that there is company-wide support.

5.5 Limitations of the Study

The study was limited to Hass Petroleum Group. The study was further limited to descriptive single case study research design and use of primary data.

5.6 Recommendations for Further Studies

The current study focused on the influence of critical success factors on successful ERP implementation at Hass Petroleum Group, future scholars ought to carry out similar studies on a different petroleum company to establish if the critical success factors are similar in the petroleum industry.

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APPENDICES

APPENDIX I: QUESTIONNAIRE

INSTRUCTIONS

I am currently a student at University of Nairobi pursuing a post graduate degree in masters of business administration. This questionnaire seeks to collect data to find out the critical success factors for a successful ERP implementation at Hass Petroleum Group. Your responses will be kept as confidential as required. Your opinion is highly valued. Please fill the questions by putting a tick in the appropriate box or by writing in the space provided.

PART A: COMPANY INFORMATION

1. In which country do you work in ?

Kenya   [ ]   Tanzania   [ ]   Uganda   [ ]

Rwanda   [ ]   South Sudan   [ ]   Zambia   [ ]

Somalia   [ ]   DRC   [ ]

2. How long has the company been in operation in the country?

1 – 5 years   [ ]   6 – 10 years   [ ]

11 – 15 years [ ]   over 15 years [ ]

3. For how many years has Oracle ERP been in use in the organization?

1 year or less [ ]   2 years   [ ]

3 years   [ ]   over 3 years   [ ]

PART B: CRITCAL SUCCESS FACTORS IN ERP IMPLEMENTATION

6. Below are several critical success factors in ERP implementation. Kindly indicate the extent to which each of the factors affected the successful implementation of ERP Hass Petroleum. Use a five-point Likert scale where:

1 = no extent   2 = little extent   3 = Moderate extent

4 = Large extent   5 = Very large extent

Statements	1	2	3	4	5
Adequate budget allocation to fund the Oracle implementation project					
Approval of the Oracle implementation by top management					
Management giving staff ample time to do project activities					
Management's involvement in setting up a competent and capable Oracle project team					
Rewarding of project team for successful project milestones					
Top management involvement in all stages of the project					
Top management's intervention in resolving conflicts arising during implementation					
Top management's public and explicit identification of the Oracle project as a top priority					
Willingness from management to allocate resources to the Oracle implementation project					
Adequate communication between internal groups and external groups (vendors and consultants)					
Advertisement of the project progress to the entire organization					
Communicating of information regarding IS policy, project priorities and selection criteria from top management to users					

Statements	1	2	3	4	5
Communication of expectations at all levels in the organization					
Employees understanding of what is changing, why it is changing and how it will help the organization					
Formal promotion of the project team by management					
Frequent communication to project team and users					
Open communication channels between users and IT personnel					
Users being allowed to air their requirements, comments and reactions regarding Oracle					
Alignment of the business process to fit the system processes in Oracle					
Employee's strong willingness to accept Oracle					
Management's strong commitment to use Oracle system for achieving business aims					
User's assurance that their jobs were secure and will not be eliminated after successful Oracle implementation					
Willingness to change some business processes so as to avoid a lot of customization on Oracle					
A project champion with the responsibility to drive success of the Oracle implementation project					
Accurate estimation of effort required to complete project tasks					
Advance planning for migration and cleaning up data					
Clear definition of the business units being affected by the implementation					
Clear determination of the critical path of the project					
Clear identification of all project tasks					

Statements	1	2	3	4	5
Constant tracking of budgets					
Constant tracking of schedules					
Identification and definitions of all Oracle project milestones					
Identification of the business processes that needs to be changed to align to Oracle					
Commitment to meeting of project deadlines					
Proper management of escalation of project issues					
Proposed system modifications being evaluated against business benefits					
Co-location of the project team members to work at a central location					
Mix of consultants and internal staff in the project team					
Compensation and incentives to the team pegged on successful implementation on time and within the assigned budget					
Project team members experience in Oracle implementation					
Project team's familiarity of the business functions and products					
Full time assignment of team members to the implementation					
Appropriate addressing of users concerns					
Involvement of users in the stages of definition of the company's system needs					
Participation of users in Oracle training					
Participation of users in testing the Oracle system					

Statements	1	2	3	4	5
Participation of users in the implementation of Oracle system					
User's participation in project selection					
Adequate documentation of Oracle was available					
The Oracle system was closely fitting the user requirements					
Oracle's compatibility with most of the existing hardware					
The hardware selection decisions based on Oracle systems' requirements					
Appropriate recommendations from consultant and vendors on what hardware was most suitable					
Quick response to system problems and user issues					
Experience in Oracle implementation by the consultant					

Thank you so much for your time

APPENDIX II: INTERVIEW GUIDE FOR SENIOR MANAGERS

SECTION A: GENERAL INFORMATION

1. What is your highest level of education?

………………………………………………………………………………………………
……….

2. How long have you worked in the current organization?

………………………………………………………………………………………………
……………..

SECTION B: CRITICAL SUCCESS FACTORS IN ERP IMPLEMENTATION

3. How did project management influence the implementation of ERP in your organization?

………………………………………………………………………………………………
……………….

4. In what ways did employee competence contribute towards implementation of ERP in your organization?

………………………………………………………………………………………………
………..

5. In what ways did you express your commitment and support towards the implementation of ERP in your organization?

………………………………………………………………………………………………
………….

6. In your own opinion, how did the culture of employees in the organization influence the implementation of ERP?

……………………………………………………………………………………………………
…

7. How did consultant competence influence the implementation of ERP in your organization?

……………………………………………………………………………………………………
…………

8. In what ways did project communication influence the implementation of ERP in your organization?

……………………………………………………………………………………………………
…………..

9. How do you compare the quality of information from the new ERP and the old accounting system?

……………………………………………………………………………………………………
…………..

10. In what ways has the new ERP impacted your organization after implementation?

…………………………………………………………………………………………………

11. How has the new ERP impacted you as an individual?

…………………………………………………………………………………………………

APPENDIX III: COMMUNALITIES

	Indicator	Initial	Extraction
1	Adequate budget allocation to fund the Oracle implementation project	1.000	0.662
2	Approval of the Oracle implementation by top management	1.000	0.768
3	Management giving staff ample time to do project activities	1.000	0.581
4	Management's involvement in setting up a competent and capable Oracle project team	1.000	0.776
5	Rewarding of project team for successful project milestones	1.000	0.713
6	Top management involvement in all stages of the project	1.000	0.796
7	Top management's intervention in resolving conflicts arising during implementation	1.000	0.734
8	Top management's public and explicit identification of the Oracle project as a top priority	1.000	0.812
9	Willingness from management to allocate resources to the Oracle implementation project	1.000	0.724
10	Adequate communication between internal groups and external groups (vendors and consultants)	1.000	0.689
11	Advertisement of the project progress to the entire organization	1.000	0.720
12	Communicating of information regarding IS policy, project priorities and selection criteria from top management to users	1.000	0.690
13	Communication of expectations at all levels in the organization	1.000	0.735
14	Employees understanding of what is changing, why it is changing and how it will help the organization	1.000	0.680
15	Formal promotion of the project team by management	1.000	0.773
16	Frequent communication to project team and users	1.000	0.801
17	Open communication channels between users and IT personnel	1.000	0.765
18	Users being allowed to air their requirements, comments and reactions regarding Oracle	1.000	0.764

	Indicator	Initial	Extraction
19	Alignment of the business process to fit the system processes in Oracle	1.000	0.706
20	Employee's strong willingness to accept Oracle	1.000	0.770
21	Management's strong commitment to use Oracle system for achieving business aims	1.000	0.686
22	User's assurance that their jobs were secure and will not be eliminated after successful Oracle implementation	1.000	0.716
23	Willingness to change some business processes so as to avoid a lot of customization on Oracle	1.000	0.734
24	A project champion with the responsibility to drive success of the Oracle implementation project	1.000	0.637
25	Accurate estimation of effort required to complete project tasks	1.000	0.748
26	Advance planning for migration and cleaning up data	1.000	0.711
27	Clear definition of the business units being affected by the implementation	1.000	0.701
28	Clear determination of the critical path of the project	1.000	0.703
29	Clear identification of all project tasks	1.000	0.648
30	Constant tracking of budgets	1.000	0.690
31	Constant tracking of schedules	1.000	0.748
32	Identification and definitions of all Oracle project milestones	1.000	0.752
33	Identification of the business processes that needs to be changed to align to Oracle	1.000	0.766
34	Commitment to meeting of project deadlines	1.000	0.760
35	Proper management of escalation of project issues	1.000	0.738
36	Proposed system modifications being evaluated against business benefits	1.000	0.690
37	Co-location of the project team members to work at a central location	1.000	0.756
38	Mix of consultants and internal staff in the project team	1.000	0.636
39	Compensation and incentives to the team pegged on successful implementation on time and within the assigned budget	1.000	0.721
40	Project team members experience in Oracle implementation	1.000	0.760

	Indicator	Initial	Extraction
41	Project team's familiarity of the business functions and products	1.000	0.816
42	Full time assignment of team members to the implementation	1.000	0.702
43	Appropriate addressing of users concerns	1.000	0.677
44	Involvement of users in the stages of definition of the company's system needs	1.000	0.762
45	Participation of users in Oracle training	1.000	0.738
46	Participation of users in testing the Oracle system	1.000	0.766
47	Participation of users in the implementation of Oracle system	1.000	0.783
48	User's participation in project selection	1.000	0.784
49	Adequate documentation of Oracle was available	1.000	0.687
50	The Oracle system was closely fitting the user requirements	1.000	0.779
51	Oracle's compatibility with most of the existing hardware	1.000	0.706
52	The hardware selection decisions based on Oracle systems' requirements	1.000	0.704
53	Appropriate recommendations from consultant and vendors on what hardware was most suitable	1.000	0.650
54	Quick response to system problems and user issues	1.000	0.739
55	Experience in Oracle implementation by the consultant	1.000	0.794

Extraction Method: Principal Component Analysis.

APPENDIX IV: FACTOR EXTRACTION

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	27.516	50.030	50.030	10.546	19.175	19.175
2	2.837	5.158	55.188	6.742	12.259	31.433
3	2.506	4.557	59.745	6.299	11.452	42.885
4	2.047	3.722	63.466	4.566	8.302	51.187
5	1.684	3.063	66.529	4.143	7.533	58.720
6	1.277	2.322	68.851	3.221	5.857	64.577
7	1.169	2.125	70.976	2.639	4.798	69.375
8	1.010	1.836	72.812	1.891	3.437	72.812
9	0.973	1.769	74.582			
10	0.857	1.558	76.140			
11	0.818	1.487	77.627			
12	0.777	1.413	79.041			
13	0.756	1.375	80.416			
14	0.725	1.319	81.735			
15	0.672	1.223	82.957			
16	0.630	1.146	84.103			
17	0.601	1.092	85.195			
18	0.553	1.006	86.201			
19	0.507	0.922	87.123			
20	0.494	0.898	88.021			
21	0.464	0.844	88.865			
22	0.436	0.793	89.658			
23	0.416	0.757	90.415			
24	0.388	0.706	91.121			
25	0.380	0.692	91.813			
26	0.360	0.654	92.467			
27	0.336	0.610	93.077			
28	0.317	0.576	93.653			
29	0.302	0.550	94.203			
30	0.281	0.511	94.714			
31	0.247	0.448	95.163			
32	0.237	0.432	95.594			
33	0.228	0.414	96.008			
34	0.208	0.377	96.386			
35	0.194	0.352	96.738			

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
36	0.182	0.331	97.069			
37	0.173	0.315	97.384			
38	0.158	0.287	97.671			
39	0.154	0.281	97.952			
40	0.141	0.256	98.208			
41	0.127	0.232	98.440			
42	0.119	0.216	98.655			
43	0.114	0.207	98.862			
44	0.088	0.161	99.023			
45	0.084	0.152	99.175			
46	0.073	0.132	99.307			
47	0.071	0.129	99.436			
48	0.057	0.104	99.541			
49	0.054	0.098	99.639			
50	0.049	0.088	99.727			
51	0.040	0.073	99.800			
52	0.034	0.062	99.862			
53	0.028	0.051	99.913			
54	0.026	0.047	99.960			
55	0.022	0.040	100.000			
Extraction Method: Principal Component Analysis.						