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Factors Affecting Adoption of Enterprise Resource Planning Systems in the Kenyan Sugar Industry (A Case of Mumias Sugar Company LTD)

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Abstract
It was found necessary to undertake this study so as to bridge the knowledge gap as concerns the factors that affect the adoption of Enterprise Resource Planning systems. The specific objectives of the study were: to establish the role of *Perceived Ease of Use* of *Enterprise Resource Planning* in its adoption; to evaluate the effect of *Perceived Usefulness* of *Enterprise Resource Planning* on its adoption; and to determine the effects of individual perception towards the adoption of *Enterprise Resource Planning*. The study focused on Mumias Sugar Company. The population of interest was the employees of the company who are current users of the *Systems Applications Product Enterprise Resource Planning*, drawn from the three categories of staff as presented in the organizational structure - Heads of departments, Managers and Supervisors, whose number stood at 200 as at 31st December 2009. A semi-structured questionnaire was the main data collection instrument. The researcher also used interview schedules with open questions, aimed at meeting the objectives of the study. Primary data were analyzed by employing descriptive statistics such as percentages. The responses indicate that perceived ease of use was a key factor in determining adoption of *Enterprise Resource Planning* in Mumias Sugar Company. The employees embraced change of technology with anticipation for better performance, which further enhanced the adoption of *Systems Applications Product Enterprise Resource Planning* in the company. In line with perceived ease of use, the other factors that influenced the adoption of *Systems Applications Product Enterprise Resource Planning* in Mumias Sugar Company include the perceived feeling of comfort when using *Systems Applications Product Enterprise Resource Planning*, the user friendliness of *Systems Applications Product Enterprise Resource Planning*, the speed with which *Systems Applications Product Enterprise Resource Planning* processed transactions and the ability of the users to get support when using *Systems Applications Product Enterprise Resource Planning*. The findings also show that Perceived Usefulness is an important factor in determining the adaptation of innovations. The higher the perceived usefulness of the *Enterprise Resource Planning* system, the higher the chances that it would be adopted. Moreover, the degree to which an individual believes that using a particular system would enhance his or her job performance enhances the chances of adopting the system and the more the suitable the system is to the work ethic of the users the higher the acceptance rate. Further, the findings show that attitudes are a significant predictor of behavior. In addition, though individual attitude is necessary in determining adoption of new technologies, it is not sufficient condition for success. Certainly attitude may not strongly determine the intentions of an individual at the workplace regarding performance when additional factors e.g. usefulness are taken into account independently.
Keywords: Enterprise Resource Planning, Perceived Ease of Use, Systems Applications Product, Legacy Systems, Perceived Usefulness, Material Requirements Planning, Business Processes

ABBREVIATION

CI	Computational Intelligence
CSE	Computer Self-Efficacy
ELS	E-Learning System
ERP	Enterprise Resource Planning
ICT	Information and Communication Technology
IS	Information Systems
ISO	International Standards Organization
IT	Information Technology
MRP	Materials Requirement Planning
MSC	Mumias Sugar Company
PEOU	Perceived Ease of Use
PU	Perceived Usefulness
QUE	Questionnaire for Usability Evaluation
SAP	Systems Applications Products
TAM	Technology Assistance Model
UTAUT	Unified Theory of Acceptance and Use of Technology

1.0 INTRODUCTION

1.1 Background of the Study

Many attempts have been made to define Enterprise Resource Planning (ERP) systems. According to Brown and Vessey (1999) An ERP is a software package that delivers a single, enterprise-wide shared database to serve and support various business functions within an organization including production, planning, manufacturing, material requirements planning, sales, finance and so forth. This allows different departments to communicate and coordinate with each other more efficiently. Fub, Gmeiner, Schiereck and Strahinger (2007) defined ERP systems as large, enterprise-wide , integrated software packages that cover administrative and, sometimes industry specific and also core-business processes. Hedman and Borell (2004) noted that ERP systems are tightly integrated at the metadata level since their operation is based on data that is commonly used across the enterprise. The ERP is modular in structure and therefore allows for integration of different functional areas. The ERP integration and extensibility are two distinctive features of ERP systems compared to other types of systems that are bought off-the-shelf. (p.211). and Gabraski (2001) concluded that ERP systems enhance a tightly coupled integration between modules ensuring seamless flow of information and thus avoiding data redundancies.

An ERP system is a modularized business application that delivers a seamless, real-time, integrated solution which empowers business executives in the efficient and effective management of resources such resources as financial, procurement, human capital and logistics (Shih, 2006). ERP systems enable an end-to-end view of the business processes and standardize them across the entire organization. The key functionality of ERP includes real-time production and accessibility of information from a single database including automation and integration of the organizations' processes. ERP systems evolved from Materials Requirement Planning (MRP) and thereafter manufacturing resource planning (MRP II) systems and would therefore appear skewed towards manufacturing. Al-Mashari, Al-Mudimigh and Zairi (2000) assert that authors hold different views in the scope of the ERP. According to Fub *et al* (2007), while some of the authors prefer a conventional definition of ERP systems, claiming that ERP systems consist solely of generic back-office functionalities that are not industry-specific whilst the core-business processes remain unchanged, other authors push for a more comprehensive ERP definition that covers both generic and industry specific core processes.

To determine the meaning of ERP it would be important to consider the industry in question. Fub *et al.,* (2007) stated that in manufacturing, a broad ERP definition seems appropriate. In service industries where the dissemination of ERP systems is lower, the scope of ERP is limited and focuses on non-specific processes, such as accounting or human resources (HR) (p.156). It would be interesting to note that Agriculture matches the dissemination of the service industry. Berensmann, Keller, Pfaff, and Skiera (2004) suggest that notwithstanding a significant lower penetration of ERP systems in banking in contrast to manufacturing, the banks' recent readiness to trade their in-house legacy applications with ERP systems has seen sturdy growth of ERP systems in banking.

It is also evident that from the top three ERP vendors (SAP, Oracle and BAAN) there is need to widen their scope of functionality to include Agriculture. Betsch and Thomas (2004) however suggest that in the value proposition selling of ERP systems to banks, ERP vendors for instance SAP has enriched the scope of functionality to also include some banking-specific processes, for example account origination. Recent trends in the sugar industry, however, portray that sugar firms are now more receptive to replacing their in-house developed custom software. Historically, their bespoke systems have been built around their line of business which includes crop husbandry, agronomy and grower services.

From the early days of data processing, firms have continued to rely heavily on an IT team to maintain and develop systems in-house. However, with the advent of batch-processing systems which saw the introduction of what is at present known as legacy applications (Moormann, 1999). Historically, the legacy systems have been built around firms' lines of business with little or no flow of information across functional lines (Chowdhury & Chowdhury, 2003). Even though, in the later years, several firms discarded mainframe-based technologies and adopted 2 tier client/server applications, old days massive in-house developed applications still play a key role in today's IT landscape (Betsch *et al.,* 2004).

The sugar industry unlike other industries has to date not experienced greater business process transformation of business processes that would warrant the redesign of their IT applications into a robust, modular, seamlessly-integrated, and more scalable manner in contrast to the in-house developed systems that are challenging in terms of data processing. They are also a major expenditure in the IT budgets stemming from license costs, maintenance and support of legacy systems (Rebouillon & Müller, 2005). Characteristic features of ERP systems include their ability to seamlessly integrate, modular in structure and ease of extension. Therefore, the usage of ERP systems may well contribute significantly to smooth the progress of IT integration (Betsch *et al.*, 2004).

Many sugar firms face severe industry-specific pressures away from their legacy systems' rigidity, poor functionality and lack of integration. To begin with, the impending collapse of the COMESA safeguard measures in 2012 poses a threat to the profitability of State-owned sugar firms at risk. State-owned firms which

have thus far been enjoying protection from COMESA countries and as a result have been rather inefficiently run , are debt-ridden and owe farmers colossal sums of money are now having to face more profitably and efficiently run sugar firms like MSC. Gakuo (2006) asserts that it would be prudent for the firms to adopt cost-cutting measures, streamline their business processes and increase their efficiency through adoption of ERP systems that will provide end-to-end visibility of their operations and as a result help them realize their strategic goals.

MSC is the largest sugar manufacturer and leading cultivator of sugarcane accounting for over 60% of domestic sugar output in Kenya. The company started operations in 1971 and has a total of 60,000 registered small scale cane farmers who supply the bulk of the raw material while the company owns and manages over 3400 hectares in the nucleus estate. MSC identified ICT as an enabler of strategic business objectives in the Strategic Plan 2004-2008 (MSC, 2005). Therefore, one of the ICT department's strategic objectives was to put in place an integrated management information system. The implementation of an ERP system was therefore aimed at achieving this strategic objective. A thorough selection process undertaken by the company resulted in mySAP ERP being the top solution. Subsequent negotiations with SAP Africa enabled the implementation project to commence in May 2006 for duration of four months (Gakuo, 2006 p.15).

The challenges faced by MSC included a centralized data processing that was slow and error prone. The systems were bespoke and standalone and some had no vendor support. The systems were running on old infrastructure and the organization exhibited very low ICT literacy levels (MSC, 2005).Suffice to say some of the business benefits gained over time by this implementation include lower costs (lower inventories, labor, wastage) hence better profits and improved customer and supplier service (reduced cycle times and enhanced accuracy). However, as aptly put across by Al-Mashari *et al.,* (2000) and Gefen and Ragowsky (2005), indeed the reality that a large number of ERP implementations may not realize value immediately and only after the system has stabilized and user confidence is gained adds to the difficulty of measuring ERP benefits.

Some of the challenges that MSC is currently facing is substantial cost of ownership in the form of software licensing and consultancy costs of the ERP. There is a lack of adequate and highly experienced SAP consultancy resources in the local market. Not to mention, the sugar industry being a non- typical ERP-deployment area implies that most of Agriculture functionality is not covered within the ERP for which other bespoke systems continue to exist.

1.2 Statement of the Problem

Extensive research on ERP especially in the USA is readily available. For instance Willis and Willis-Brown (2002) identified two distinct phases of ERP adoption: ERP implementation and ERP integration. The pace and outcome of research on ERP in developed and developing economies are very different. There is limited research available on ERPs in developing countries and can only be found for China and Greece, hence the need to undertake a similar study focusing on developing countries. DeLeone and McLean (2003) observed that the user-acceptance technology as a necessary condition for the effective implementation of information systems (IS) within the organization has been the subject of IS research for many decades (p.149) According to Baron, Patterson and Harris (2006) "Technology acceptance has become a central issue in IS research since the TAM was first advocated by Davis (2003). Over the following 15 years, the TAM has been tested, re-examined, refined and expanded in order to reflect the range of technological (mainly IT/IS) developments over that period" (p.114)

Raymond and Uwizeyemungu (2007) sought to build and validate a typological profile of manufacturing small to medium-sized enterprises (SMEs) in Canada in regard to their eventual adoption of an ERP system. Koh, Simpson, Padmore, Dimitriadis and Misopoulos (2006) examined ERP adoption in Greek companies, and explore the effects of uncertainty on the performance of these systems and the methods used to cope with uncertainty. Nicolau (2004) employed a comprehensive and large sample of ERP adopting firms over a wide sampling time frame and carefully matches ERP adopting with non-adopting firms.

MSC in the strategic plan 2004-2008 identified ICT as an enabler of strategic business objectives and as such one of the ICT department's strategic objectives was to put in place an integrated management information system (IMIS). In 2006, following a rigorous selection process ERP SAP was selected for implementation to help achieve this strategic objective. According to Oliver and Romm (2002) and Shang and Seddon (2002), firms should seek a cost-leadership strategy in the short and medium term in order to regain profitability. In an effort to streamline operations and to enhance efficiency as operational benefits firms should consider re-designing their businesses processes and adopt ERP systems. For the long haul a firm should aim at achieving greater organizational efficiency and effectiveness as a strategy (Hedman *et al.*, 2003). This study has attempted to determine the level of adoption of ERP in MSC based on the factors earlier highlighted. The study has further explored the factors affecting the adoption of ERP systems within a specific industry in an attempt to gain a deeper understanding of ERP adoption in a non-traditional industry where according to Zhu (2004), the usage of ERP is not perceived to be a standard yet. Studies by Ioannou and Papadoyiannis (2004), Spathis and

Constantinides (2002) and Towers (2005) indicate that there are salient differences in adoption between large and small manufacturing firms. This study has thus made an attempt to bridge the knowledge gap by focusing on the factors affecting ERP systems adoption in a less developed country (LDC) in Africa with a focus on to MSC in the Kenyan Sugar Industry.

1.3 General Objective

The general objective of this study was to determine the factors that affect the adoption of ERP systems (A case of Mumias Sugar Company).

1.4 Specific Objectives

The study was developed using the following specific objectives:

(i) To establish the role of perceived ease of use (PEOU) of ERP in its adoption.
(ii) To evaluate the effect of perceived usefulness (PU) of ERP on its adoption
(iii) To determine the effect of individual attitude towards the adoption of ERP

1.5 Definition of Terms

Business Processes: A business process is a series of steps designed to produce a product or service (Rummler and Brache, 2000).

Material Requirements Planning (MRP): The material requirements planning module is like a computerized inventory control and production planning system. It will use the bill of material (BOM) as its basis (Barry, Hameed and Badii, 2008).

Adoption: This is defined as the transfer (conversion) between an old system to a target system in an organization (Eason, 1999).

Perceived Ease of Use (PEOU): The belief regarding how much the use would be free of mental effort (Lu, Yu, Liu and Yao, 2003).

Perceived Usefulness (PU): The degree to which individuals believe that using a particular system would enhance their job performance (Lu, Yu, Liu and Yao, 2003).

Legacy Systems: Existing systems and technology that an organization has a considerable investment in and that might be entrenched in the organization (McGee, 2005).

2.0 LITERATURE REVIEW

2.1 Introduction

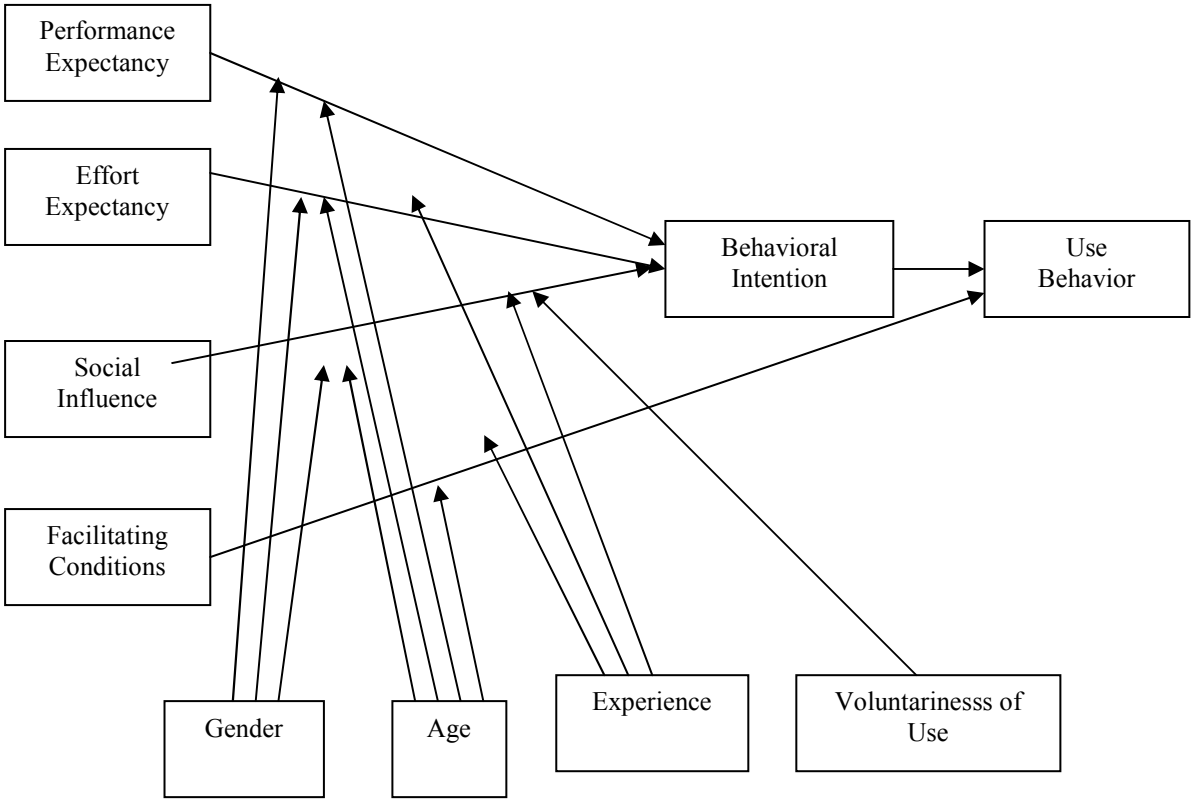
This chapter represents an evaluation of the literature on the factors affecting Enterprise Resource Planning (ERP) systems adoption as discussed in previous studies. The subsequent sections begin by looking into technology adoption in general and several models and theories are advanced to explain. The factors that have affected ERP adoption are also investigated. The chapter is presented in relation to the specific objectives in the area of perceived usefulness (PU) of ERP, perceived ease of use (PEOU) of ERP and individual attitude in the adoption of ERP. Existing literature is further used to explain these factors and more importantly the effect of the factors on ERP adoption. Finally, the chapter is summarized based on the literature presented on the factors affecting ERP adoption.

2.2 Perceived Ease of Use (PEOU) and Adoption of ERP

This section presents literature on the PEOU and Adoption of ERP that is relevant to the study.

2.2.1 Theoretical perspectives and Models on Technology Adoption

Venkatesh, Morris, Davis (2003) analyzed the research on eight Information Technology acceptance models: Theory of Reasoned Action (TRA); Technology Acceptance Model; motivational; planned behavior theory; combined Technology Acceptance Model and planned behavior theory; PC utilization model; theory of innovation diffusion; and theory of social cognitive. As a result of bringing together elements spanning the eight models, they built and empirically authenticated and revised TAM that has been known to be called the Unified Theory of Acceptance and Use of Technology (UTAUT) (Figure 2.1). Similar to TAM, UTAUT is renowned as aiding in enlightening and forecasting of technology adoption in organizations. Venkatesh *et al.*, (2003) stated that "this has been very useful in the firms' management assessing the benefit realization for new technology and helping to clarify the critical success factors and the variables that would ensure acceptance" (p. 425).



Source: Ventakesh *et al* (2003)
Figure 2.1: Adaptations to original TAM Model

2.2.2 Technology Acceptance Model

Technology Acceptance Model has generated a lot of interest in the academic literature, and broad summaries of the literature and variations are available in Ingham and Collerette (2003), Yu *et al.,* (2003) and J.E (2003). The literature is widely acclaimed for both its illustrative and analytical properties .As an illustration, Ingham *et al.* (2003) conclude that TAM has established itself as a critical theoretical model in helping to clarify and explain user attitude and behavior towards technology and its use including during the implementation of the system. (p. 202). Shih (2006) suggests that recent empirical studies have focused on exploring the external variables that influence decisions to use technologies, but doing so indirectly via their influence on user beliefs (PU and PEOU). Other research examined the association between PU and PEOU on the one hand and use per se on the other hand include Karahanna et al., (2000) and Horton, Buck, Waterson and Clegg (2002).

TAM was adapted to highlight the underlying causes between external factors to the individuals' intention to use technology and actual usage in a work environment. Technology Acceptance Model brings forth two particular constructs, PU and PEOU. PU describes the individual's view of the extent to which utilizing the technology advances the individuals' productivity in the work environment, whereas PEOU refers to the individuals' view of the amount of effort required to make use the technology. On the plus side, TAM highlights peoples' motivations and the actions they take to achieve their goals. However, there have been some reservations as well. Venkatesh *et al.* (2003) argues that while parsimony is TAM's strength, it is also the models important constraint.

Most of the published research concerning consumer adoption of technology has been inclined to focus on the social, demographic and psychographic attributes of probable adopters. Although these types of personal traits of a consumer have been found to be evidence of acceptance (Gahtani, 2002) a growing body of research has shown that it is the seeming attributes of technology itself as opposed to the personal traits that are the stronger predictors of the acceptance decision (Lynch 2002).

Rogers (2003) asserts that the attributes of any technology as viewed by the different members of a collective group can shed light on the various acceptance levels for that technology (p 208). The above study introduced five factors that affect adoption with the primary characteristic being the competitive edge i.e. the fact that the technology is seemingly viewed as relatively more advanced to the technology it seeks to replace (Premkumar et al., 1995). The rest of the factors are concerned with the technical aspects of the innovation, specifically its suitability (in relation to the firms' internal procedures and processes), its level of complexity, level of visibility of its achievements and its trial ability.

2.2.3 Perceived Ease of Use

PEOU is tied to an individual's assessment of the effort involved in the process of using the technology. Measure of PEOU in this study is in terms of how clear and understandable is the interaction with system, ease of getting the system to do what is required, mental effort required to interact with the system, and ease of use of technology. The selection of TAM was based primarily on its parsimony and predictive power, which makes the model easy to apply to a different information system device (Venkatesh *et al.,* 2000; Pikkarainen, Pikkarainen, Karjaluoto, and Pahnila, 2004; Guriting and Ndubisi, 2006). The focus in TAM has mainly been on technology acceptance in organizations.

In fact, Brown *et al.* (1999) advanced that PU per se is not a key determinant regarding usage but further relied on the extraneous factors, which were more likely to affect PEOU. Venkatesh *et al.* (2001) has performed tests on TAM with simplicity/complexity, perceived and technology self-efficacy, self motivation, technology discomfort and individuals perceived satisfaction. They went ahead and performed empirical tests with a model targeting 3 firms and working with 300 employees within the firms over a three month period. Venkatesh (2000) defines simplicity/complexity as the extent to which consumers perceive a new innovation as easy to understand or use. For consumers without previous computer experience, or for those who believe that e-banking is difficult to use, adoption of these innovations may be thwarted. Technology discomfort, is the tendency of an individual to be uneasy, apprehensive, stressed or has anxious feelings about the use of technology is a similar construct to computer anxiety, a variable that has been found to have a negative effect on perceived ease of use (Venkatesh, 2000).

Studies on the success of the process of gaining knowledge and understanding of the software have shown the significance of the learner's computer self-efficacy (CSE). This is defined as a learner's self-judgment of the ability to utilize a computer. Learner's with high computer self-efficacy are principally driven to be persistent in their pursuit of a goal, and not easily disheartened by failure. (Venkatesh, 2000; Wang *et al.*, 2003). Few individuals with high CSE are expected to become frustrated with technology. Moreover, studies have shown that higher CSE is closely linked with higher PEOU of IT. The authors of the above study proposed that individuals with higher CSE would understand ERP better and hence increase the usability. Further they hypothesized that perceived self-efficacy regarding confidence in one's ability to use technology would have a positive effect on an individual's judgment about the usefulness and ease of using technology.

2.2.4 Relative Importance of PEOU

According to Meuter (1999), Bobbitt and Dabholkar (2001), Dabholkar and Bagozzi (2002), Walker, Craig-Less, Hecker and Francis (2002), personal contact and perceived risk should be considered within the framework of this kind of research. Wang, Tang and Tang (2001) noted that some research has been associated to PEOU to the achievement and value of Information Systems and customer satisfaction. Consumers who feel uncomfortable with technology will have a greater desire for personal contact, defined as the interpersonal interactions providing direct response, assurance, a sense of control and social interaction. This construct is proposed to have a negative effect on perceived ease of use and perceived usefulness of technology. In terms of perceived risk, consumers may perceive technology as riskier. This perceived riskiness is proposed to have a negative effect on perceived ease of use and perceived usefulness of technology.

According to Scott and Vessey (2002), early researchers who were studying the field of technology and its usability identified the basic principles of a good design, namely using a superior conceptual model prior to designing a product, using consistency and speaking the users' language. Krug (2000) argues that usability of technology is the process of ensuring that the technology works as expected, and that a user of average competency can use it relatively well as intended with little or no frustration. This practice has been carried out consistently to the design of goods for sale, as well as entire software systems, including the user interface, supporting documentation and help system (Hohmman, 2003).

International Standards Organization (ISO) 9241 Part 11 (1995) defines usability as the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use. Effectiveness measures the "goodness" of the output by the user or whether users can perform their tasks, whereas efficiency has more to do with the quantity of work output in relation to the time, effort and resources involved. The user satisfaction index is a measure of the preferences including perceptions regarding the usability of a product. High usability products will allow for users to perform their duties as expected in a timely fashion and with little or no frustration.

According to Ceaparu, Lazar, Bessiere, Robinson, and Shneiderman (2004) "ERP systems have a broad scope in the features and functionality. Nonetheless, a richer system can offer less useful functionality if it its' usability is viewed as poor. Users might look for alternative manual work-around or even on the whole circumvent the use of the system... Besides, rich functionality, intricacy and flexibility, as exhibited by ERP systems, can result in, misunderstanding, uncertainty, disappointment and other disturbing negative responses, which can lead to inaccurate entries, especially for learners." Learners do not comprehend the cause of the error and are incapable of responding to the error appropriately; which may result in them acting in ways that could

potentially make the situation worse (Goodwin, 1999). Then again, minimal customizations and enhancements into the usability can result into large cost savings (from avoidance, reduction of risk, and reduction in errors, training and support), user productivity will be enhanced and improved user satisfaction levels (Ceaparu *et al.,* 2004).

Studies on usability acknowledge the importance of navigability of the system (Gillan and Bias, 2001). Clear presentation employs the basic fundamentals in graphics and design for graphics, layout, colors, white space, clarity and fonts, meanwhile ensuring users are not distracted from the task at hand. According to Ceaparu *et al*. (2004), "learning is critical in terms of usability because redundant technical terminology and confusing acronyms hinder effective learning."(p.43). Hohmann (2003) concludes that jargon should be used from within the widely accepted language of its users

2.3 Perceived Usefulness (PU) and Adoption of ERP

This section represents the literature on the PU including Adoption of ERP that is relevant to the study.

2.3.1 Perceived Usefulness and the role of perceived ease of use of ERP

According to Al-Gahtani (2001) and Mathwick, Rigdon and Malhotra (2001), "Perceived Usefulness is the degree to which an individual believes that using a particular system or technology would enhance his or her job performance." (p.245) PU is an important factor in determining the adaptation of innovations (Tan and Teo, 2000). Bhattacherjee (2002) observed that an individual's readiness to conduct business via a system having identified the system is better known as PU. Measures of PU of information systems in this study will be considered in terms of increase in productivity, improvement in job performance, enhancement of job effectiveness and usefulness in the job.

Several empirical studies have argued that PU is a major catalyst of information technology usage (Venkatesh et al., 2003; Gefen, 2003; Hsu and Lu, 2004; Ong *et al.,* 2004). Trombley and Lee (2002) defined E-learning also known as Web-based or E-learning as "ways of gaining knowledge in which content is disseminated in an electronic instructional manner delivered through the internet". Within the e-learning framework, a learner perceives that utilization of an E-Learning System will be less complex and relatively effortless and fairly simple. For that reason, PU will appeal to their primary objective to acknowledge and accept the E-Learning System, in a direct manner or indirect through PEOU. Studies carried out on TAM also demonstrate that PEOU of technology has an impact on its PU. Individuals that generally consider technology as difficult to use will argue that it is not helpful (Davis, 2003)

2.3.2 Impact of Perceived Usefulness on ERP Systems Success

It is widely acknowledged that users would have an incentive to accept an ERP system when it is viewed that the ERP could aid them in accomplishing expected performance levels (Amoako-Gyampah and Salam, 2004). Accordingly, the higher the usefulness of utilizing the ERP, the greater the likelihood it is that it would be accepted. Earlier studies often comprise of correlations regarding usefulness and its adaptation Agarwal, Erramilli and Chekitan, (2003). and Ndubisi and Jantan (2001) define PU as a construct linked to a judgment of the benefits realized by an individual or firm via the use of the innovation. Technology acceptance or an assessment of its usage has generally been characterized by a positive attitude towards work and productivity (Venkatesh *et al*., 2003).

A major area of study of system implementation has been to establish why people accept or reject new technology. Another acceptance criterion of new technology is relative advantage which is related to the degree to which technology is perceived as being superior to the innovation it supersedes. The degree of relative advantage is often expressed as economic profitability, social prestige, and savings in time and effort, immediacy of the reward or as decrease of discomfort. (Rogers, 2003, p.212). The construct of relative advantage is highly domain specific and thus advantage can be seen differently in context of different innovations and on other hand of different users. Research by Ndubisi and Jantan (2001) takes into account usage based on usage behavior per se which becomes a major contribution of the research to the body of knowledge. The study postulates that persona-system characteristics (e.g. PU and PEOU) and system usage will be experienced by the user when they possess greater IT knowledge and receive strong technological support.

CSE is a dominant factor in regard to the role it plays on the impact on PEOU and PU (Hayashi, Chen, Ryan and Wu 2004). This is as a result of the level of the users' confidence in their computer-acquired knowledge and capabilities that has an influence on their perception of the ease or difficulty in performing a specific function using new technology and how relevant that new technology will be to their functions. The "magnitude of CSE" is known as the level to which users have confidence that they are able to carry out complex assignments using a computer (Compeau et al., 1999). Individuals with a higher level of CSE will exhibit a greater aptitude to control the system independently with not as much dependence for routine aid and technical support. For that reason the individuals will, as a result, perceive the system as valuable in their acquisition of knowledge.

2.3.3 The Impact of PU on Intention

Social influence profoundly affects user behavior. Despite the fact that the impact of individual norms on intention remains uncertain, from earlier studies a considerable amount of academic and experiential proof in relation to the significance of the role of individual norms on the use of technology, directly or indirectly, through PU in the workplace (Venkatesh *et al.,* 2003; Hsu *et al.,* 2004). As a direct consequence, this study includes individual norms and the adoption and usage of ERP systems. This is to help in determining whether group pressure has any relevance in individual users decision-making to utilize the system in the particular environment of Mumias Sugar Company, though Venkatesh *et al*. (2003) results found a positive consequence of individual norms on personal intention when the users were mandated to use IS, because having been made compulsory required users to find ways of overcoming difficulties of use.

The findings of Chen, Zeng, Atabakhsh, Wyzga and Schroeder (2003) revealed that PU per se may very well be the determining factor and have a considerable positive influence on user intent. Although, Rossi, Tuunainen, Oorni (2006) postulated that PU's impact on intention is not independent of situations that an ERP is being utilized, whereas both constructs are the main influencers relating to attitude and beliefs regarding individuals intentions to use technology. Research by Wu et al., (2005) revealed that PEOU and PU were important in implementation of an ERP system since they had a direct effect on the use of technologies. In the Malaysian context, for instance, studies on the use of technology have established that both the PEOU and PU are not only important in influencing the choice of not only whether to accept technology in addition to determine whether to utilize that technology (Ramayah and Jantan, 2004; Ramayah and Ignatius, 2005; Ramayah , Ignatius and Aafaqi, 2005; Guriting *et al.,* 2006; Ramayah, 2006a, 2006b;).

TAM places greater significance of PU above PEOU as the main indictor of technology adoption. A lot of research, tracing it from the early years of Bagozzi, David and Warshaw (1999), have been unable to find a positive correlation between PEOU and technology utilisation, and as a result relegating PEOU to the position of something like that of a "step-child" (Venkatesh et al., 2000). Some studies which suggest an inverse relationship between PU and usage (Dasgupta *et al.*, 2002). Gefen *et al.* (2000) propose that, given that in a lot of instances the new system is accepted due to the external aspects which is manifested via PU and not its inherent aspects, PEOU therefore impacts the usage of the inherent attributes of the system contributing to the true result of its application.

2.3.4 Impact of Perceived Usefulness on ERP Systems Success

In an ERP implementation, understanding the logical flow of the business processes across the organization is important for assisting the users adapt to changes in their tasks. Users will persist in their endeavors to achieve their purpose if it is useful and significant to them, even if an application or its documentation is complex to use (Ceaparu *et.al.,* 2004.) Contrary to the original TAM, which implied that the impact of extrinsic factors should be channeled via both constructs, their outcomes showed a positive correlation between experiences gained and usage; which was the next greatest influence after PU.

The greater the suitability of the ERP system to exist within the organization including the work ethics of users, the higher the probability for acceptance. Agarwal and Karahanna (2000) emphasized this in a technology research linking the significance of this operational aspect of compatibility. This is especially helpful when influencing attitudes and beliefs about PU and PEOU and ultimately the adoption of the system. The authors above suggested accordingly that firms seeking to implement ERP systems need to be aware of the compatibility of the related workflow powered by the ERP and the users' current and preferred work ethics.

Users will persist in their endeavors to accomplish a goal if it is useful and significant to them, even if a system or its training guide is challenging to use. TAM research also portrays that PEOU of technology affects its PU. Users that perceive technology in general to be difficult to use will rationalize that it is not useful (Mosbeh and Soliman, 2008). The proponents of self-image argue that the utilization of new technology at the workplace helps the user project a positive self-image. As a result, the user's positive reflection among the superiors is sufficient to attract their attention for career advancement. Therefore, the greater the perception of ERP as a predictor of positive self-image the higher the chances it will be utilized within the organization. The results of this study are in tandem with Venkatesh *et al.* (2003) who established a direct correlation between the PU and self-image.

Perceived usefulness remains fundamental in influencing the acceptance of ERP systems. This is critical to note especially because many employees highly rate performance and career oriented objectives and therefore result in positive work ethics (Ahearne, Frambach, and Moenaert, 2001). Research by Karahanna *et al.,* (1999) states that at the stage of pre-adoption, the outlook of the users is strongly dependent on a structure of multi-facets beliefs, while the stage of post-adoption is fully prejudiced by instrumental beliefs of utility and image.

It is noted that PU, technological literacy and technological support are major influencers of IS usage in firms. In fact, the correlation between PU on IS usage has been discussed in numerous earlier studies. Organizations, with sound management who have good insight regarding the value of the ERP, have tended to

realize benefit more than those with low PU of the ERP. In addition, technology that seems to have a high PU are foreseen as being necessary, as recommended by the positive correlation existing PEOU and PU. An indirect relationship exists between PEOU and usage via PU, implying that the PEOU per se does not have a bearing on system usage, unless the ERP systems are judged as easy to use and also termed useful.

The significance of technological skills and IT support towards shaping IS usage is outstanding. Both technological skills and IT support have a direct impact on usage of technology, directly and indirectly via PU and PEOU. The impact continues to be experienced throughout the firm as it continues to progress in general computing skills and as long as the support provided by IT or consultants is continuously given to users thereby ensuring the usage of technology will be continuously improved within the firm. (Mosbeh *et al.*, 2008). Besides, the persona-system attributes PEOU and PU are supported by technological skills and IT support. The constructive relationships between the anchors and user perceptions are important for two reasons. First and foremost, as the user gets more skilled in accomplishing the task, the easier the work load becomes and the more positive the attitude and appreciation of the benefits of performing the task. Secondly, when users receive support from an expert, over time this increases the users knowledge and even difficult tasks become easier to accomplish and therefore the user has a better chance of appreciating the importance of the task. (Ceaparu *et al.,* 2004).

2.4 Attitude and the Adoption of ERP

This section presents literature on attitude and the adoption of ERP that is relevant to the study.

2.4.1 Theoretical Perspectives on Attitude

The studies relating to the behavior aspects of technology usage and realization are majorly about the effect of attitude on computers. Ajzen and Fisbein (1980) developed the TRA that perceives an individual's intention to behave in a particular manner as the direct contributor of the action. (Bagozzi *et al.*, 1992) defined attitude as defined as an individuals' positive or negative bias towards an object. Individual attitudes are fundamental to the behavioral theory, as they are viewed to be important indicators of human behavior. The studies relating to attitudes in the usage of technology continue as shown in research by Pare and Elam, (1995 and Harris (1999). According to Igbaria and Iivari, (1995) user attitudes had a direct effect on the usage of technology by end-users.Rainer and Miller (1996) postulated that attitudes regarding computers have an effect on users' intentions that result in the actual utilization of the technology. The earlier studies on TAM that have researched on the effect of attitude on IT utilization included the study by Taylor et al., (1995).

Computer attitude is advanced originally in TAM, nonetheless, a revision of TAM by Davis *et al.* (1999) carried out in a relaxed work environment showed that the descriptive aspect of TAM is just as important and it is more conservative without the mediating attitude construct. Subsequent to that, the attitude construct was excluded from the TAM. Studies carried out later on TAM indicate that attitude continues to act as a mediator in influencing mandatory usage; although its' direct correlation to intentions was not endorsed by Jackson et al., (1997) and Adams *et al.*, (1992).

According to Jackson et al., (1997) "Computer attitude, like many behavioral constructs, would be a required but not satisfactory condition for a successful implementation of technology" (p. 383). This view is supported by Davis *et al.* (1999) who assert that when other factors e.g. PU per se is taken into account, computer attitude may not influence strongly the behavioral intentions in the work environment. This reasoning is supported by the fact that in the work environment, performance is considered vital and the intentions will be rated based on performance and not on individual preferences with regard to formation of behavior. (Taylor *et al*., 1995).

2.4.2 Shared Beliefs and Attitude

In a study related to implementation of ERP systems in the US, Amoako-Gyampah *et al*. (2004) argued that users who will be involved in the implementation process should be identified from different levels in an organization. Therefore for an organization to successfully achieve this, mutual trust and a sense of commitment requires to be nurtured between the various users. According to Amoako-Gyampah *et al.* (2004), the belief shared regarding the envisaged benefits of the system are important in allowing the users find a common ground and develop a united purpose. Shared beliefs are often the basis for which attitude is formed. As a result, studying the process under which beliefs are constructed provides opportunities to understand how they are formed and can be intervened for purposes of shaping the beliefs. It is important to note that this is especially important in comprehending behavioral intentions with respect to introducing new technology (Amoako-Gyampah *et al*., 2004).

Within the framework of the above study, shared beliefs are defined as the beliefs that different stakeholders within an organization champion amongst their peers and managers regarding the importance of the system. MacNeil (2004) suggests that team leads who play a facilitation role and encourage transfer of knowledge through continuous communication to within their reporting lines, act as catalysts in environments where change is experienced as a result of new technology which is introduced. According to Karahanna *et al.,*

(1999), factors that affect the belief constructs of PU and PEOU have been ignored in many studies. The study by Karahanna *et al* (1999) explores the effect of shared beliefs on PEOU and PU of a particular system. In general, users in an organization expect positive results in the horizon when they share a common belief regarding the utility of the ERP system.

Ardichvili, Page and Wentling (2004) proposed that prior to users deciding on whether to engage or have a discourse with senior management, they try to anticipate and make predictions, based on their earlier experiences. Sharratt and Usoro (2003) cite that to effectively receive knowledge and understanding is through learning through trusted experts required for the circumstances, which would result in the acquisition of new found knowledge. Nevertheless, Van Beveren (2002) felt that for effective dissemination of information, a broad range of exchanges was required and the inherent complexities of the process of exchange may not necessarily result in the expected creation of knowledge. Therefore, knowledge sharing inherently necessitates the creation of new knowledge in the mind of the recipient of the exchange.

Amoako-Gyampah *et al.* (2004) study evaluated the effect of shared beliefs on technology and two widely recognized critical success factors regarding implementation namely end-user training and organizational communication on PEOU and PU. The analytical results demonstrated that both training and project communication influence the shared belief formed by users regarding the benefits of the technology and also that the shared beliefs influence the PU and PEOU of the technology.

2.4.3 Relative Importance of Attitude on TAM

TAM had earlier put forward two constructs, known PEOU and PU, that both influence the attitudes of users towards a given system. It is such attitude coupled with PU that would consequently influence the intention to use technology and additionally, result in actual system usage. Agarwal *et al*. (2002) and Venkatesh *et al.* (2003) show that both constructs PEOU and PU affect intentions both directly and indirectly. Karahanna *et al.* (1999) report that pre-adoption attitudes of employees are determined primarily by normative pressures and post-adoption attitudes. These are based almost exclusively on beliefs of usefulness and image enhancement.

Attitudes are said to develop over time through a learning process affected by reference group influences, past experience and personality (Assael, 1992, p.183). Au and Enderwick (2000) continue that the more experience a consumer has about technology, the better understanding the consumer will have about new technologies. Thus, a better understanding of technology allows the consumer to better appreciate the added value brought by new technological improvements. The studies in the behavioral characteristics regarding technology usage and realization fully document the effect of users' attitude on computers. Heikki *et al*. (2000) explains that the developed TRA perceives a user's intention to carry out an action as the direct determinant of the accomplishment.

It has been observed that environments where ERP usage is mandatory, user attitude has been known to have a strong relationship with the behavior regarding usage. In this work environment, "the only option that exists for a user in the event that they have no reason to leave the firm is to embrace the technology wholeheartedly (Leonard-Barton, 2000, p. 604). Users who have not totally embraced the ERP can slow down or stall the implementation, and avoid, work-around, or sabotage the ERP. Massey, Montoya-Weiss and Burkman (2004) propose that such responses are as a result of attitude (negative or positive) that users will develop in relation to technology. At the workplace where technology usage is mandatory, user attitude is most likely to take be keenly monitored and therefore necessitating greater attention.

2.4.4 Management Strategies to Change Attitude for a Successful ERP Implementation

In an effort to positively influence the attitudes of potential ERP users, senior management should attempt to change their cognitive component. Of paramount importance is to have a communication strategy in place. A lot of the time, ERP system implementations have failed due to poor communication (Al-Mashari e*t al.,* 2002). Another communication strategy is to give a general description of how the implemented ERP system will work. Teaching each of the various user groups how the ERP system works is important in creating awareness (Stratman and Roth, 1999). In general, the communication team responsible for developing the communication strategies must possess adequate political skills so as to be able to shape the thinking of the user community and ensure that the awareness stage is successfully executed to completion. (Aladwani, 1999).

It has been found necessary to influence the There is need to influence the emotional aspect of users' attitudes. First and foremost this can be managed through cost minimization. Michael Porter (2004) asserts that a low-cost strategy can be used to help a firm thrive in an environment of intense competition. He further argues that this strategy can provide meaningful results for ERP. For the management to ensure that the ERP system is adopted by users, and then it is prudent for the users' adoption costs to be kept at a bare minimum. In addition if the agents of change convince the ERP users that the net effect of the implementation will be positive, then the users will be influenced to adopt a positive attitude towards accepting the ERP (Amoako-Gyampah, 1999).

Differentiation as another additional strategy has been known to have a positive effect on the attitude towards adoption of potential users. User-training provides a good opportunity to enable them accept the system and the changes that it will potentially introduce, and as such a positive attitude is cultivated towards the system.

In addition, user training provides a much needed hands-on experience that result in a greater appreciation of the functions and features of the system, and its potential benefits. The first strategy that should be adopted is to gain the endorsement and buy-in of well-respected individuals and opinion leaders. Lazarus (1999) provides the senior management a clear rule stipulating that an ERP system should not be introduced when and until a positive attitude (individual intention to accept) has been developed and sustained over time among potential users.

2.5 Chapter Summary

This Chapter has reviewed important in relation to the research objectives of the study. It has highlighted the relevant theories of technology adoption, perceived ease of use (PEOU) of ERP, perceived usefulness (PU) of ERP and attitude in the adoption of ERP. Research Methodology, which specifies the research design to be used as well as the target population, sample design, methods for data collection, procedures for research and methods for data analysis to be used, will be explored in the next chapter.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Introduction

This chapter covers a description of the overall research methodology. This includes the study design, target population, sample design, methods of data collection, and procedures for research and data analysis methods.

3.2 Research Design

According to Brown, Askew, Baker, Denvir and Millett (2003), research design provides the glue that holds the research project together. A design is used to structure the research, to show how all of the major parts of the project, which include the samples or groups, measures, treatments or programs, and methods of assignment that work together to try to address the central research questions.

For purposes of this study, a case study research design was used. Yin (2004) describes this as an empirical inquiry that of a modern phenomenon looking into a real-life situation; especially in the event that the divide between the two are not obvious and there exists multiple sources of evidence. A case study generally aims to provide insight into a particular situation and often stresses the experiences and interpretations of those involved. It may generate new understandings, explanations or hypotheses. However, it does not usually claim representativeness. Therefore, researchers using case studies should be careful not to over-generalize (Ball, 2004). Case studies involve collecting empirical data, generally from one or a small number of cases. It usually provides rich detail about those cases, of a predominantly qualitative nature (Yin, 2004).

Hamel, Dufour and Fortin (2003) argue this research is very useful when bringing researchers to gain a better understanding of challenging issues and as a result contribute to the existing body of knowledge from previous research. According to Eisenhardt (2004), “case studies highlight in-depth analysis of content exhibited by relatively few numbers of occurrences or circumstances and their correlation. A number of renowned case study researcher’s e.g.Stake (2005), Simons (2003) and Yin (2004) use certain methods for carrying out their work successfully. This particular case study research calls upon their work and suggests six steps that are used namely to understand and determine the research questions, choose the studies and present techniques for data collection and analysis, collect field data collection, evaluation and analysis of data, and preparation of the final report.

The major challenge expected in using the case study approach is that the researcher is required to have excellent knowledge of the topic when designing questions. The researcher approaches the subjects of study with an inquisitive mind and an openness that permits subjects to respond in an unlimited number of directions. This less structured approach may take the researcher down avenues he did not anticipate traveling and open doors to new kinds of understanding.

3.3 Population and Design

3.3.1 Population

The study focused on Mumias Sugar Company. The population of interest was the employees of the company who are current users of the Systems Applications Product (SAP) ERP, whose number stood at 200 as at 31st December 2009. The respondents were drawn from the three categories of staff as presented in the organizational structure - Heads of departments, Managers and Supervisors.

3.3.2 Sampling Design

3.3.2.1 Sampling Frame

This is defined as a source list that enables a study population to be drawn. A list of the staffs of Mumias Sugar Company who were using the Systems Applications Product (SAP) ERP as at 31st December 2009 was obtained from the ICT department. Table 3.1 below presents the sampling frame.

Table 3.1: Different Cadre of ERP users in MSC

Staff Cadre	Position	Population
MSC 0	Heads of Departments	8
MSC 1	Managers	65
MSC 2	Supervisors	127
Total		**200**

3.3.2.2 Sampling Technique

Purposive sampling design was used to select Heads of Departments to participate in the study. Neuman (2000) noted that purposive (judgemental) sampling is used to select respondents that are particularly informative enough to respond to the research questions and enable effective attainment of the research objectives. Accordingly, all the Heads of departments participated in the study. In addition, stratified random sampling was used to select a representative sample of ERP users from amongst the managers and supervisors in the various departments.

3.3.2.3 Sample Size

Cooper and Schindler (2000) assert that the researcher must clearly define the characteristics of the population, determine the required sample size and choose the best method for selecting members of the sample from the larger population in order to ensure that the sample accurately represents the population. Accordingly, the sampling process took place in two stages. In the first stage, all the Heads of departments were selected using purposive sampling. Table 3.2 below presents the list of Heads of departments to participate in the study.

Table 3.2: List of Heads of departments selected to participate in the study

Department	Number of Heads of departments selected
Agriculture	1
Factory	1
Human Resources	1
Finance	1
Sales & Distribution	1
Information Technology	1
Internal Audit	1
General Management	1
Total	**8**

In the second stage, a representative sample of respondents was selected from amongst the remaining 192 ERP users with the aid of stratified sampling. A listing of all the 192 users was drawn and from each of the departments, 30% of the population was selected to from the sample. Table 3.2 below presents the sample size of the remaining cadre of staff

Table 3.3: Sample Size

Department	Number of users of ERP in MSC besides Heads of Departments (A)	Sample Size 30% (A)
Agriculture	15	5
Factory	46	14
Human Resources	18	5
Finance	71	21
Sales & Distribution	26	8
Information Technology	8	2
Internal Audit	3	1
General Management	5	2
Total	**192**	**58**

In total, 75 respondents were selected to participate in the study.

3.4 Data Collection Methods

Both primary and secondary data were collected. Secondary data was collected in order to ensure relevance to the research problem and eliminate duplication of what has been done and provide a clear understanding of existing knowledge base in the problem area. The sources of secondary data included authoritative, recent, and original sources such as journals, books, thesis and dissertations.

Primary data was collected using a semi-structured questionnaire. A self-administered questionnaire was used since the level of understanding of the questions by the respondents was expected to be relatively high. The questionnaire was considered effective since it is not time consuming, considering that all respondents are based at the company offices in Mumias Township.

3.5 Research Procedures

The semi-structured questionnaire used to collect data was structured into four sections. Sections A, B and C covers items pertaining to the specific objectives of the study namely:-Perceived Ease of Use, Perceived Usefulness and Attitude while section D covers the profile of the respondents.

The questionnaires were pilot tested on ten randomly selected respondents before they were administered. The purpose of the pilot testing was to ensure that the questionnaires were understood in their correct perspective, in order to meet the research objectives. The procedure that was used in collecting data was through distribution of the questionnaires that is, dropping and picking questionnaires from respondents at their most convenient time that was agreeable to both parties.

A letter of introduction, which stated the purpose of the study, was attached to each questionnaire. In addition, the researcher made telephone calls to the respective respondents to make follow up on the questionnaires that were delivered to the respondents. Once completed, the researcher personally collected the questionnaires. This gave the researcher the opportunity to clarify certain issues arising from the various responses.

3.6 Data Analysis Methods and Presentation

Data analysis involved preparation of the collected data - coding, editing and cleaning of data so that it would be processed using SPSS package. The coded data was keyed into the SPSS program where it was developed into a database and hence analyzed. The data pertaining to profile of the respondents and their respective organizations was analyzed using content analysis while data pertaining to the objectives of the study was analyzed by employing descriptive statistic. Descriptive statistics were used to describe the basic features of the data in the study. Together with simple graphics analysis, they formed the basis of virtually every quantitative analysis of data. Descriptive statistics help to simplify large amounts of data in a sensible way. Each descriptive statistic reduces lots of data into a simpler summary. Presentation of the information was done using frequency tables and percentages.

4.0 RESULTS AND ANALYSIS

4.1 Introduction

This chapter covers the data analysis, presentation and interpretation of primary data collected. A case of Mumias Sugar Company was undertaken and primary data were obtained from employees of the company who currently use the SAP ERP. Out of the 75 questionnaires that were distributed, 61 were returned completed, (81%) return rate.

4.2 Demographic Data

This section presents the profile of the respondents. The section covers brief information on gender distribution, age of respondents, the period of time the respondents had worked in Mumias Sugar Company, the cadre of staff, the highest level of education attained, the departments in which the respondents worked and their respective roles in SAP ERP implementation.

4.2.1 Gender distribution of the respondents

The respondents were asked to indicate their gender. The responses are summarized and presented in figure 4.1 below.

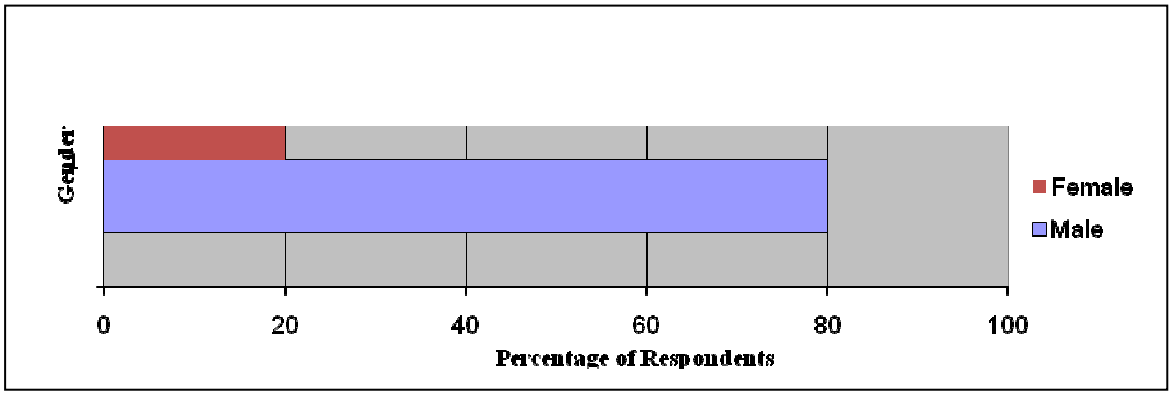


Figure 4.1: Gender Distribution of the Respondents

The responses show that while 80% of the respondents were male, 20% were female.

4.2.2 Age Distribution

The respondents were asked to indicate the age bracket to which they belonged by ticking as appropriate against given alternatives. The responses are summarized and presented in figure 4.2 below.

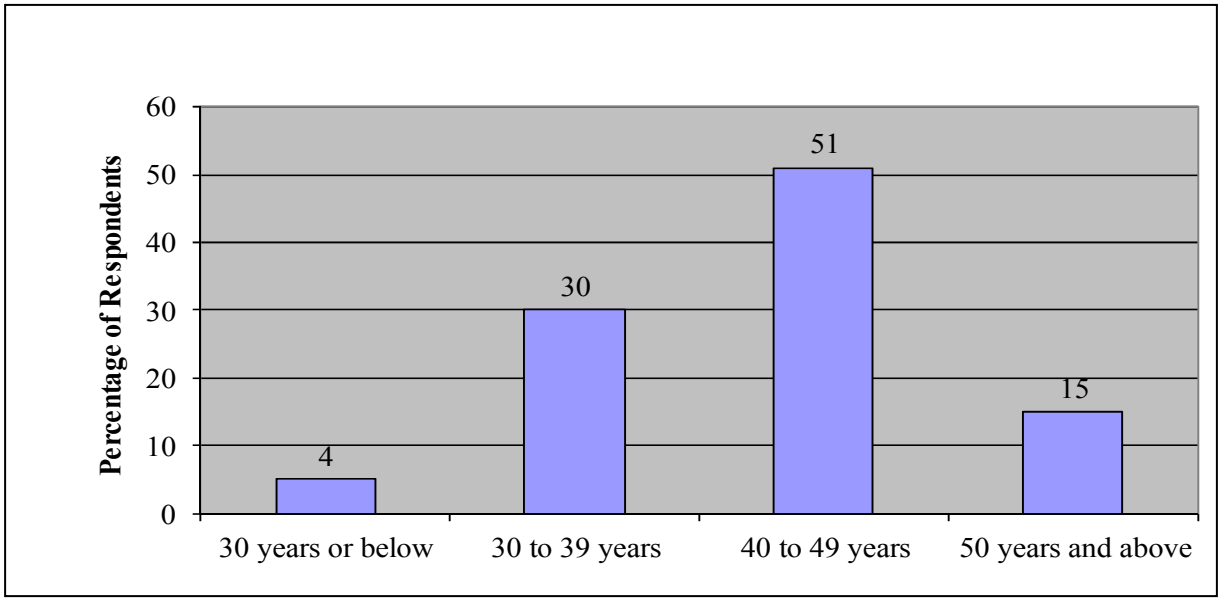


Figure 4.2: Age Distribution of Respondents

The responses in figure 4.2 highlight that majority (51%) were aged between 40 and 49 years. Whereas only 4% of the respondents were 30 years or below, 30% were aged between 30 and 39 years and 15% were aged 50 years and above.

4.2.3 Period of Service at Mumias Sugar Company Ltd

The respondents were asked to indicate the time period they had been in employment in Mumias Sugar Company Ltd. Figure 4.3 below presents a summary of responses pertaining to the number of years of service by employees in Sugar Company Ltd.

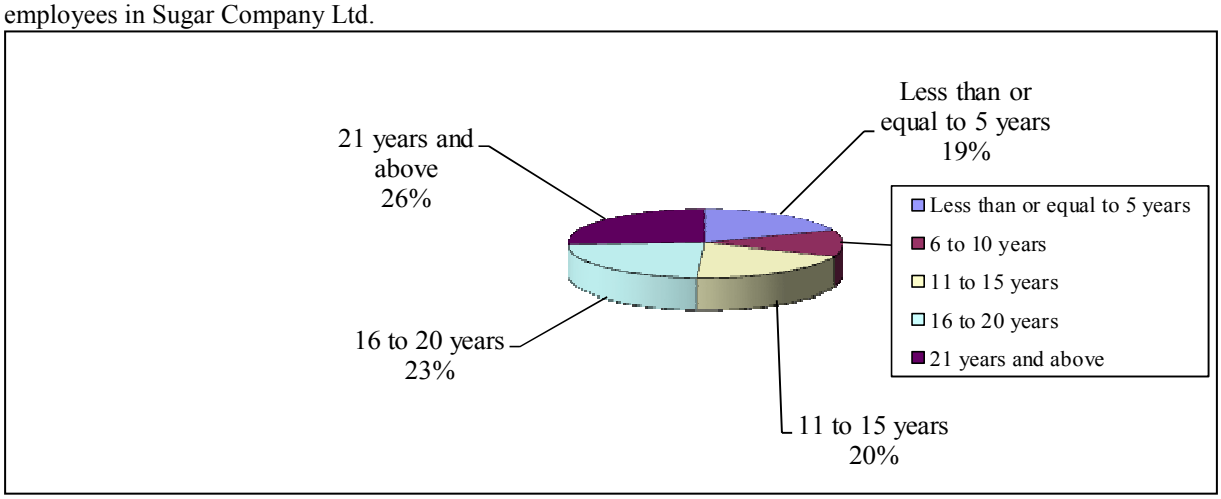


Figure 4.3: Period of Service at Mumias Sugar Company Ltd

The findings show that whereas 19% of the respondents had worked in Mumias Sugar Company for a period of less than or equal to 5 years, 12% had worked for Mumias between 6 and 10 years, 20% had worked for Mumias between 11 and 15 years, 23% of the respondents had worked for the company for between 16 and 20 years and majority (26%) of the respondents had worked for the company for 21 years and above.

4.2.4 Cadre of Respondents within Mumias Sugar Company.

The respondents were asked to indicate their cadre within Mumias Sugar Company. The responses are summarized and presented in figure 4.4 below.

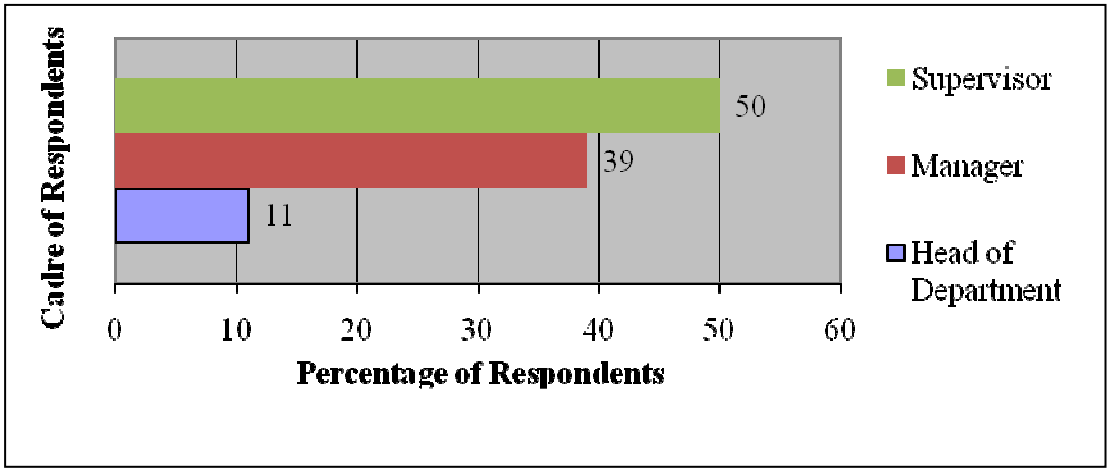


Figure 4.4: Cadre of Respondents within Mumias Sugar Company

The findings in figure 4.4 highlight that majority (50%) were supervisors (50%), 39 % were managers and 11% of the respondents were Heads of Departments. Other cadres mentioned included: confidential clerk, clerk, stores officer and technician.

4.2.5 Highest Level of Education Attained

The respondents were asked to indicate the highest level of education they had attained. The responses in summary are presented in figure 4.5 below.

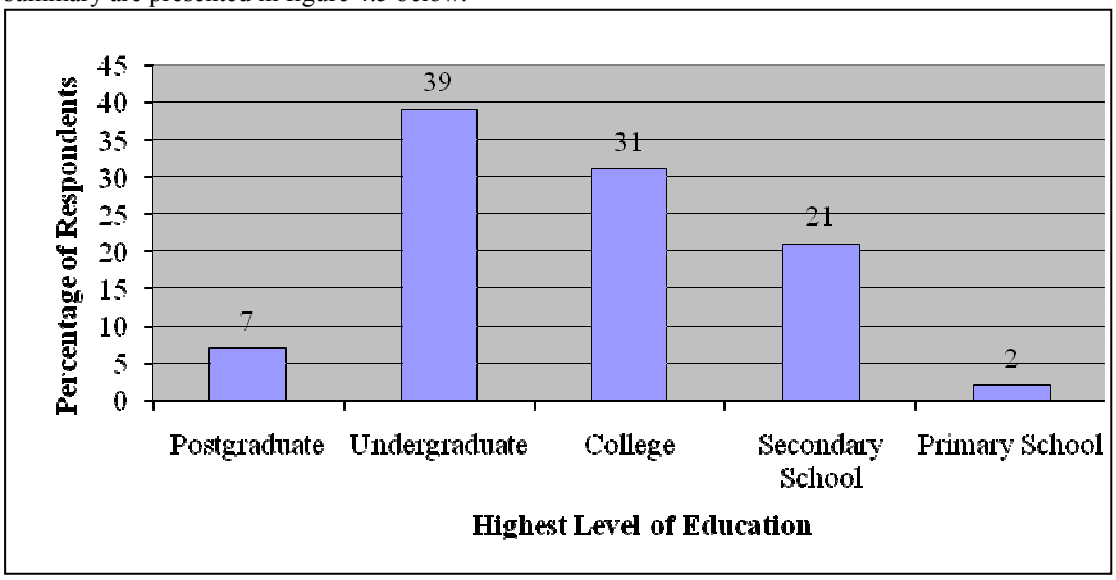


Figure 4.5: Highest Level of Education Attained

The responses in figure 4.5 show that majority (39%) had Undergraduate degrees, 31% had a college education, 7% had attained Postgraduate degree, 21% had secondary school education and 2% had attained primary school education.

4.2.6 Current Department of Respondents

The respondents were asked to indicate the departments in which they worked. The responses are summarized and presented in figure 4.6 below.

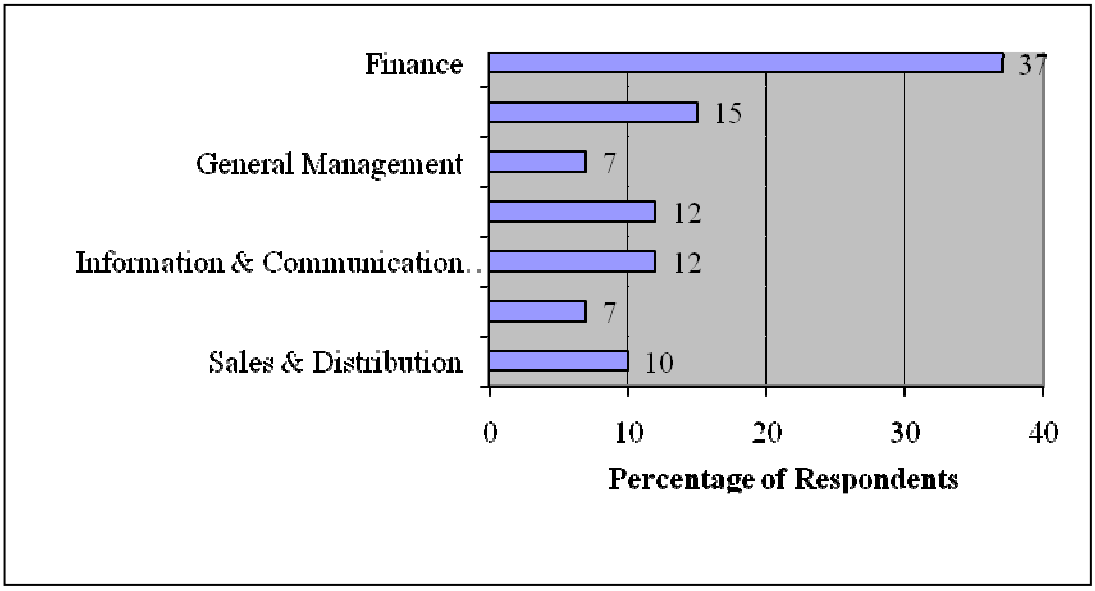


Figure 4.6: Current Department in which the Respondents Work

The responses in figure 4.6 above show that while 10% of the respondents worked in the Sales and Distribution department, 7% worked in Agriculture department, 12% worked in Information and Communication Technology, 12% worked in the Human Resources department, 7% were in General Management, 15% worked in the factory and majority (37%) worked in the Finance department.

4.2.7 Role of Respondents in the SAP ERP Project Implementation

The respondents were asked to indicate their respective roles in the SAP ERP project implementation. The responses are summarized and presented in figure 4.7 below.

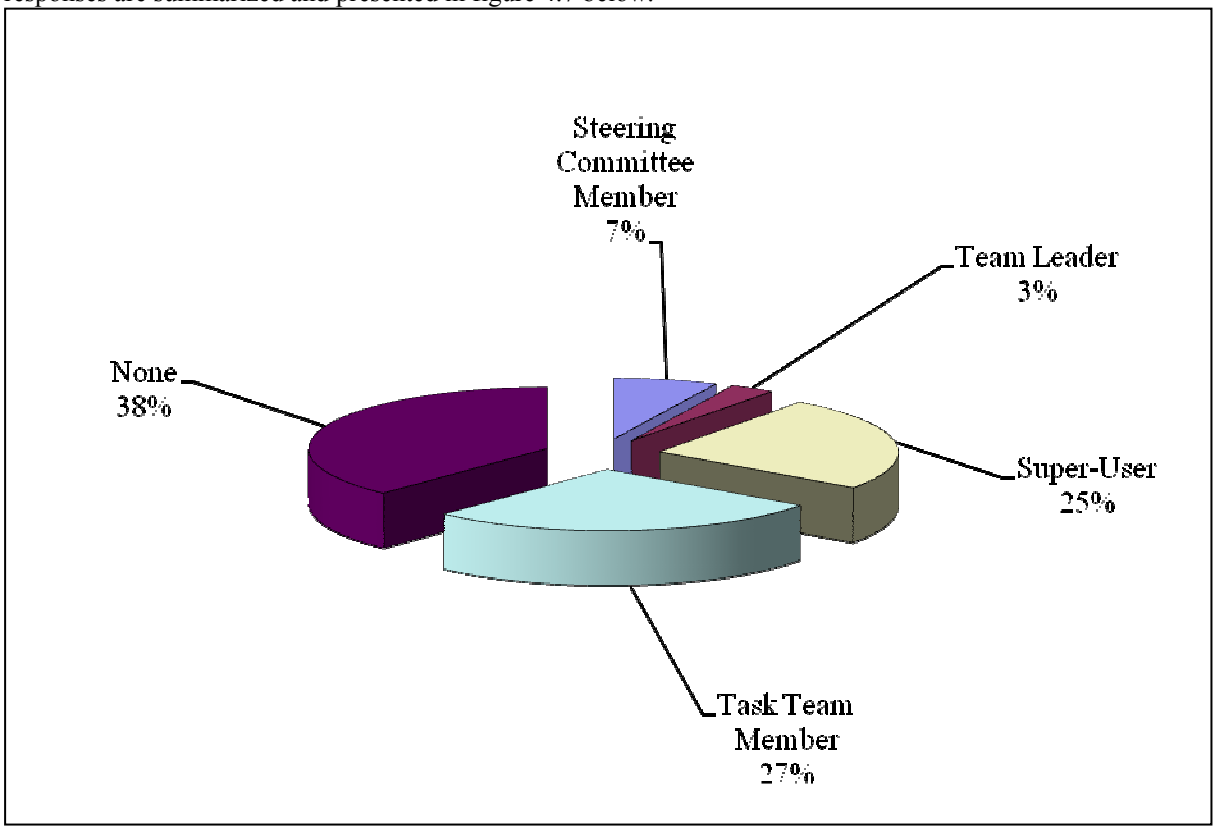


Figure 4.7: Role of Respondents in the SAP ERP Project Implementation

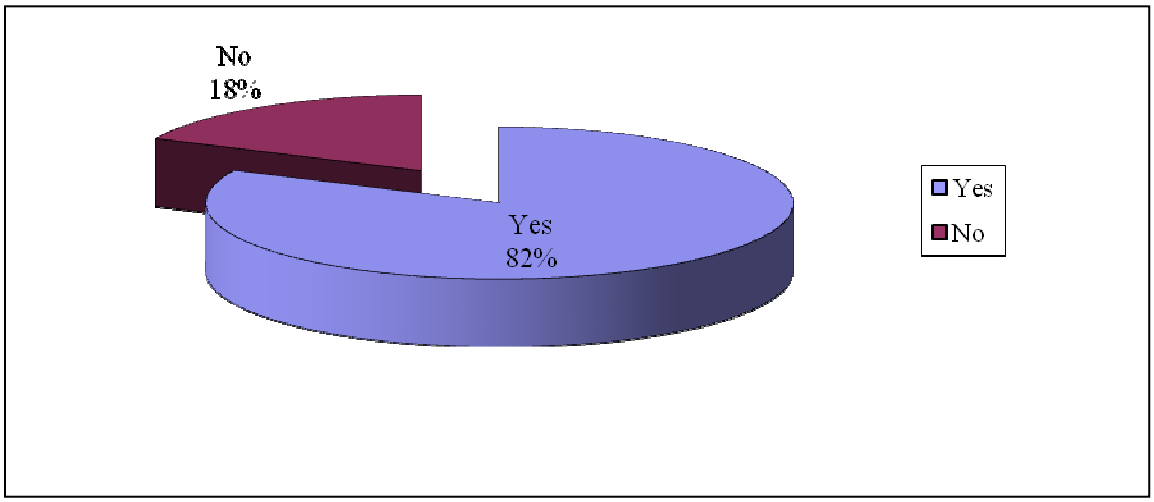
The responses in figure 4.7 above show that while 7% of the respondents were steering committee members, 3% were team leaders, 25% were super – Users, 27% were task team members and 38% did not have any role in implementation of the SAP ERP.

4.3 The Role of Perceived Ease of Use (PEOU) of ERP in its Adoption.

This section presents the findings on the role of perceived ease of use of SAP ERP in its adoption. In order to meet the first objective of the study, "to establish the role of perceived ease of use (PEOU) of ERP in its adoption", the respondents were asked various questions, whose responses are presented below.

4.3.1 Previous Computer Experience

The respondents were asked to indicate whether they had any previous computer experience. The responses are summarized and presented in figure 4.8 below.



The responses in figure 4.8 show that whereas 82% of the respondents had previous computer experience, 18% did not have previous experience. The respondents were further asked to indicate whether they knew what Enterprise Planning (ERP) system is. The responses show that all the 62 (100%) respondents knew what ERP was.

4.3.2 Previous Experience with other Systems/Applications other than SAP ERP

The researcher sought to establish whether the respondents had any previous experience with systems/applications other than SAP ERP. The responses in summary are represented in table 4.1 below.

Table 4.1: Previous experience with other systems/applications other than SAP ERP

		Frequency	Percent	Cumulative Percent	
Responses	Yes	41	67.2	67.2	
	No	20	32.8	100.0	
	Total	**61**	**100.0**		

The responses in table 4.1 show that whereas 67% of the respondents had previous experience with systems/applications other than SAP ERP, 33% indicated that they did not have previous experience in other systems.

4.3.3 Current users of Systems Applications Product ERP

The respondents were asked to indicate whether they were current users of Systems Applications Product (SAP) ERP. The responses in summary are represented in table 4.2 below.

Table 4.2: Current users of Systems Applications Product ERP

		Frequency	Percent	Cumulative Percent	
Responses	Yes	60	98.4	98.4	
	No	1	1.6	100.0	
	Total	**61**	**100.0**		

The above table shows that 98% were current users of the System Applications Product (SAP) ERP. Whereas 2% indicated that they were not using the system.

4.3.4 Time Period Respondents had used Systems Applications Product

The respondents were asked to indicate the time period they had been users of Systems Applications Product (SAP) ERP. The responses are summarized and presented in table 4.3 below.

Table 4.3: Time Period Respondents had used Systems Applications Product

		Frequency	Percent	Cumulative Percent
Responses	Below 6 months	2	3.3	3.3
	Between 7 and 11 months	5	8.2	11.7
	Between 12 and 16 months	7	11.5	23.3
	Between 17 and 21 months	7	11.5	35.0
	Above 22 months	39	63.9	100.0
	Missing	1	1.6	
Total		**61**	**100.0**	

The responses in table 4.3 show that 3% have been using the SAP ERP for below 6 months, 8% have been using for between 7 and 11 months, 12% have been using between 12 and 16 months, and also those between 17 and 21 months were 12% and 65% had used for above 22 months.

The respondents were further asked to indicate how often they used SAP ERP in their work. While some of the respondents used SAP ERP in their work as need arose, others used it in periodic audits.

4.3.5 Numeric Value Corresponding to Respondents' Personal Opinion on Ease of Use of SAP ERP

The researcher sought to establish the numeric value corresponding to personal opinions of the respondents with regards to various SAP ERP attributes by asking the respondents to tick as appropriate along a five-point likert - scale. The responses are summarized and presented in the tables below.

4.3.5.1 Ease of Use of SAP ERP

Table 4.4 below presents a summary of the respondents' opinions "to the statement, "SAP ERP is easy to use".

Table 4.4: SAP ERP is Easy to Use

		Frequency	Percent	Cumulative Percent
Responses	Disagree	1	1.6	1.7
	Agree	39	63.9	66.7
	Strongly agree	20	32.8	100.0
	Missing	1	1.6	
Total		**61**	**100.0**	

The responses in table 4.4 show that whereas 2% disagreed SAP ERP is easy to use with various attributes, 65% agreed and 33% strongly agreed it was to use various attributes.

4.3.5.2 Comfort Level when Using SAP ERP

The respondents were asked to indicate whether they were feeling comfortable using Systems Applications Product (SAP) ERP. Below is the summarized responses are summarized and presented in the table below.

Table 4.5: **Comfort Level when Using SAP ERP**

		Frequency	Percent	Cumulative Percent
Responses	Not sure	2	3.3	3.4
	Agree	35	57.4	62.7
	Strongly agree	22	36.0	100.0
	Total	59	96.7	
	Missing	2	3.3	
Total		**61**	**100.0**	

The responses in table 4.5 show that whereas 3% of the respondents were not sure whether they were comfortable using SAP ERP, 57% agreed to be comfortable while 36% strongly agree to be comfortable.

4.3.5.3 User-Friendliness of SAP ERP

The researcher sought to establish whether the Systems Applications Product SAP ERP was user friendly. The summarized responses are presented in the table below.

Table 4.6: User-Friendliness of SAP

		Frequency	Percent	Cumulative Percent
Responses	Not sure	2	3.3	3.4
	Agree	35	57.4	62.7
	Strongly agree	22	36.0	100.0
	Missing	2	3.3	
Total		**61**	**100.0**	

The responses in table 4.6 above show that 3% were not sure whether SAP ERP was user friendly, whereas 59% agreed and 37% strongly SAP ERP is user friendly.

4.3.5.4 Speed of SAP ERP transaction processing

The respondents were asked to indicate whether Systems Applications Product (SAP) ERP transaction processing is fast. The summarized responses are presented below.

Table 4.7: Speed of SAP ERP transaction processing

		Frequency	Percent	Cumulative Percent
Responses	Not sure	10	16.4	16.7
	Agree	31	50.8	68.3
	Strongly agree	19	31.1	100.0
	Missing	1	1.6	
Total		**61**	**100.0**	

The responses in table 4.8 show that 17% were not sure whether SAP ERP transaction processing is faster, 52% agreed, and 31 % strongly agreed SAP ERP transaction processing is fast.

4.3.5.5 SAP ERP Support

The researcher sought to establish whether the respondents were able to get support while using Systems Applications Product SAP ERP. The responses are summarized and presented in table 4.8 below.

Table 4.8: SAP ERP Support

		Frequency	Percent	Cumulative Percent
Responses	Disagree	2	3.3	3.3
	Not sure	1	1.6	5.0
	Agree	45	73.8	80.0
	Strongly agree	12	19.7	100.0
	Missing	1	1.6	
Total		**61**	**100.0**	

The responses in table 4.8 above show that 3.3% disagreed 2% were not sure, 75% were not sure whether SAP ERP transaction processing is faster, 5agreed and 20% strongly agreed to be getting support in while using SAP ERP.

4.4 The Effect of Perceived Usefulness (PU) of ERP on its Adoption

This section presents the findings on the effect of perceived usefulness of SAP ERP on its adoption. In an effort to fulfill the second objective of the study, "to evaluate the effect of perceived usefulness (PU) of ERP on its adoption", the respondents were asked various questions, whose responses are presented below.

4.4.1 Respondents Usage of the Legacy (Old) System Prior to SAP ERP

The respondents were asked to indicate whether they were using the legacy (old) system prior to SAP ERP. The responses are summarized and presented in figure 4.9 below.

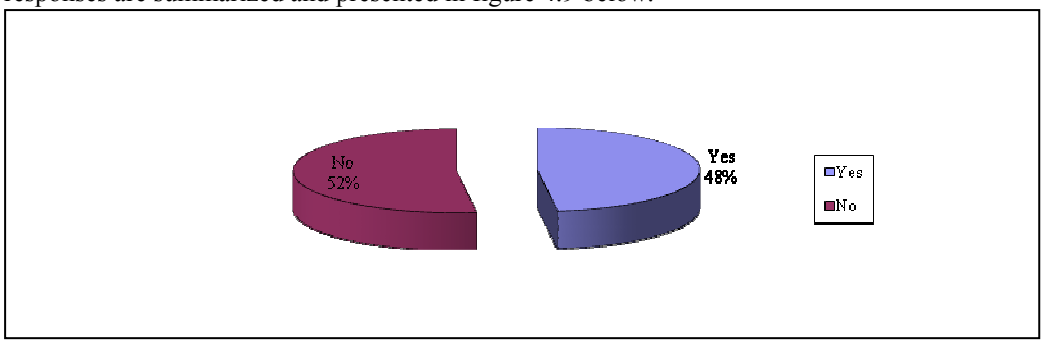


Figure 4.9: Respondents Usage of the Legacy (Old) System Prior to SAP ERP

The responses in figure 4.9 above show that 48% were using the legacy (old) system prior to SAP ERP whereas 52% were not.

4.4.2 Type of User of SAP ERP

The researcher sought to establish what type of user the respondents were in Systems Applications Product SAP ERP. The responses are summarized and presented in table 4.9 below.

Table 4.9: Type of User of SAP ERP

		Frequency	Percent	Cumulative Percent
Responses	Transaction Processing User	31	50.8	51.7
	Approver	23	37.7	90.0
	Information User	3	4.9	95.0
	ICT Support	3	4.9	100.0
	Missing	1	1.6	
	Total	**61**	**100.0**	

The responses in table 4.9 indicates that 52% were transaction processing user, 38% were approved users, 5% were information users and also 5% ICT support users, of Systems Applications Product SAP ERP.

4.4.3 Importance of Use of SAP ERP in respondents' Careers

The respondents were asked to indicate whether the use of Systems Applications Product SAP ERP was important in their career of MSC. . The responses are summarized and presented in table 4.10 below.

Table 4.10: Importance of Use of SAP ERP in respondents' Careers

		Frequency	Percent	Cumulative Percent
Responses	Yes	42	68.9	70.0
	No	18	29.5	100.0
	Missing	1	1.6	
	Total	**61**	**100.0**	

The responses in table 4.10 show that whereas 70% of the respondents said SAP ERP was important to their career in MSC, 30% said no.

4.4.4 Frequency of Usage of SAP ERP

The researcher sought to establish how often the respondents use SAP ERP in their work. The responses are summarized and presented in table 4.11 below.

Table 4.11: Frequency of Usage of SAP ERP

		Frequency	Percent	Cumulative Percent
Responses	Daily	44	72.1	74.6
	Weekly	10	16.4	91.5
	Monthly	5	8.2	100.0
	Missing	2	3.3	
	Total	**61**	**100.0**	

The responses in table 4.11 above show that 75% were using Systems Applications Product SAP ERP on daily basis, 17% on weekly base, whereas 8% on monthly base.

4.4.5 Numerical Value Corresponding to Respondents' Personal Opinion on Perceived Usefulness of SAP ERP

The researcher sought to establish the numeric value corresponding to personal opinions of the respondents with regards to various SAP ERP attributes by asking the respondents to tick as appropriate along a five-point likert - scale. The responses are summarized and presented in the tables below.

4.4.5.1 Convenience of SAP ERP compared to Old System

The researcher sought to establish whether using Systems Applications Product SAP ERP convenient is compared to the old system. The responses are summarized and presented in the table 4.12 below.

Table 4.12: Convenience of SAP ERP compared to Old System

		Frequency	Percent	Cumulative Percent
Responses	Not sure	17	27.9	28.3
	Agree	28	45.9	75.0
	Strongly agree	15	24.6	100.0
	Missing	1	1.6	
Total		**61**	**100.0**	

The responses in table 4.12 above shows that 28% were not sure whether using SAP is convenient compared to the legacy (old) systems, 47% agreed and 25% strongly agreed that it was convenient compared to the legacy (old) systems.

4.4.5.2 Getting Information from SAP ERP compared to finding same information from another person

The researcher sought to establish whether it was a bother using Systems Applications Product SAP ERP to get information instead of finding the same from another person. The responses are summarized and presented in table 4.13 below.

Table 4.13: Getting Information from SAP ERP compared to finding same information from another person

	Response	Frequency	Percent	Cumulative Percent
Responses	Strongly disagree	1	1.6	1.7
	Disagree	2	3.3	5.1
	Not sure	27	44.3	50.8
	Agree	21	34.4	86.4
	Strongly agree	8	13.1	100.0
	Missing	2	3.3	
Total		**61**	**100.0**	

The responses in table 5.5 show that 2% strongly disagreed, 3% disagreed, 46% were not sure, 36% agreed while 14% strongly agreed it did not bother them to use SAP to get information instead of finding the same information from another person.

4.4.5.3 The Opportunity to Try Various Functionalities and Access Information in SAP apart from Respondents' Normal Work.

The respondents were asked to indicate whether they had opportunity to try various functionalities and access information in Systems Applications Product SAP ERP apart from their normal work. The responses are summarized and presented in table 4.14 below.

Table 4.14:The Opportunity to Try Various Functionalities and Access Information in SAP apart from Respondents' Normal Work.

	Response	Frequency	Percent	Cumulative Percent
Responses	Strongly disagree	4	6.6	6.7
	Disagree	27	44.3	51.7
	Not sure	11	18.0	70.0
	Agree	13	21.3	91.7
	Strongly agree	5	8.2	100.0
	Missing	1	1.6	
Total		**61**	**100.0**	

The responses in table 4.14 show that whereas 7% strongly disagreed, 45% disagreed, 18%, were not sure while 22% agreed and 8% strongly agreed having opportunity to try various functionalities and access information in Systems Applications Product SAP ERP apart from their normal work.

4.4.5.4 SAP ERPs' Enrichment of Respondents Work

The respondents were asked to indicate whether Systems Applications Product SAP ERP has added value to their work. The responses are summarized and presented in table 4.15 below.

Table 4.15: SAP ERPs' Enrichment of Respondents Work

	Response	Frequency	Percent	Cumulative Percent
Valid	Disagree	1	1.6	1.7
	Not sure	3	4.9	6.7
	Agree	30	49.2	56.7
	Strongly agree	26	42.6	100.0
	Missing	1	1.6	
Total		**61**	**100.0**	

The responses in table 4.15 indicates that 2% disagreed, 5% were not sure while 50% agreed and 43% strongly agreed SAP ERP has added value to their work.

4.4.5.5 Work Efficiency using SAP ERP

The respondents were asked to indicate whether Systems Applications Product SAP ERP has increased efficiency in my work. The responses are summarized and presented in table 4.16 below.

Table 4.16: Work Efficiency Using SAP ERP

	Response	Frequency	Percent	Cumulative Percent
Responses	Disagree	4	6.6	6.7
	Not sure	5	8.2	15.0
	Agree	22	36.1	51.7
	Strongly agree	29	47.5	100.0
	Missing	1	1.6	
Total		**61**	**100.0**	

The responses in table 4.16 show that 7% disagreed, 8% were not sure whereas 36% agreed and 46% strongly agreed SAP ERP has increased efficiency in their work.

4.4.5.6 Ability to perform most of the Job Functions Using SAP ERP

The researcher sought to establish how often the respondents use Systems Applications Product SAP ERP in their work. The responses are summarized and presented in table 4.17 below.

Table 4.17: Ability to perform most of the Job Functions Using SAP ERP

	Response	Frequency	Percent	Cumulative Percent
Responses	Strongly disagree	2	3.3	3.4
	Disagree	19	31.1	35.6
	Not sure	2	3.3	39.0
	Agree	17	27.9	67.8
	Strongly agree	19	31.1	100.0
	Missing	2	3.3	
Total		**61**	**100.0**	

The responses in table 4.17 show that 3% strongly disagreed, 31% disagreed, 3% were not sure

whereas 28% agreed and 31% strongly agreed to perform most of their function using SAP ERP.

4.4.5.7 SAP ERP Usage in MSC

The researcher sought to establish whether Systems Applications Product SAP ERP is used widely in MSC. The responses are summarized and presented in table 4.18 below.

Table 4.18: SAP ERP Usage in MSC

	Response	Frequency	Percent	Cumulative Percent
Valid	Disagree	1	1.6	1.7
	Not sure	25	41.0	44.1
	Agree	25	41.0	86.4
	Strongly agree	8	13.1	100.0
	Missing	2	3.3	
Total		**61**	**100.0**	

The responses in table 4.18 show that 2% strongly disagreed, 42% were not sure, whereas 42% agreed and 14% strongly agreed SAP ERP is used widely in MSC.

4.4.5.8 Availability of SAP ERP

The researcher sought to establish whether Systems Applications Product SAP ERP is available most of the time. The responses are summarized and presented in table 4.19 below

Table 4.19: Availability of SAP ERP

	Response	Frequency	Percent	Cumulative Percent
Valid	Disagree	3	4.9	5.0
	Not sure	10	16.4	21.7
	Agree	35	57.5	80.0
	Strongly agree	12	19.6	98.3
	Missing	1	1.6	
Total		**61**	**100.0**	

The responses in table 6.1 show that 5% disagreed, 17% were not sure, whereas 58% agreed and 20% strongly agreed SAP ERP is available most of the time.

4.5 The Impact of Individual Attitude towards the Adoption of ERP

This section presents the findings on the impact of individual attitude towards the adoption of SAP ERP. In order to meet the third objective of the study, "to determine the impact of individual attitude towards the adoption of ERP", the respondents were asked various questions, whose responses are presented below.

4.5.1 Respondents' trust in SAP ERP to Process Data Entered

The respondents were asked to indicate whether they trusted SAP ERP to be able to process accurately the data they had entered. All the respondents (100%) did indicate that they trusted SAP ERP to be able to process accurately the data they had entered.

4.5.2 Reliability of Information Retrieved from SAP ERP

The respondents were asked to indicate whether the information they retrieved from the SAP ERP was reliable. All the respondents (100%) did indicate that the information they retrieved from the SAP ERP was reliable.

4.5.3 Reliability of SAP ERP in Performance of Functions

The respondents were asked to indicate whether the SAP ERP was reliable and if they depended on it to perform their functions. All the respondents (100%) did indicate that the SAP ERP was reliable and that they depended on it to perform their functions.

4.5.4 Perceived Risks with using SAP ERP

The respondents were asked to indicate whether there are any perceived risks with using SAP ERP. The responses are summarized and presented in figure 4.10 below.

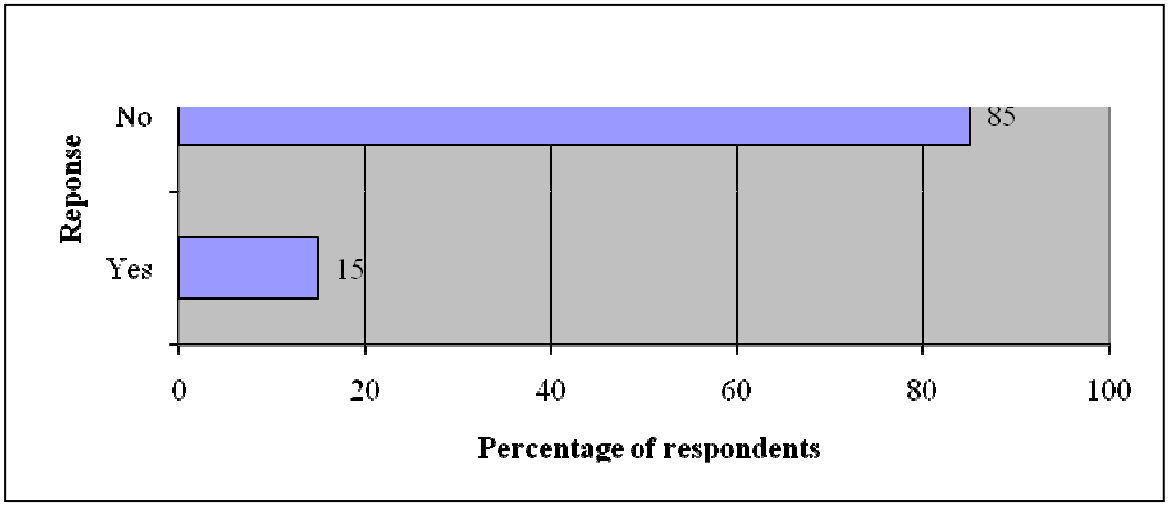


Figure 4.10: Perceived Risks with Using SAP ERP

4.5.5 Numerical Value Corresponding to Respondents' on Attitude on Usage of SAP ERP

The researcher sought to establish the numeric value corresponding to personal opinions of the respondents with regard to various SAP ERP attributes by asking the respondents to tick as appropriate along a five-point likert - scale. The responses are summarized and presented in the tables below.

4.5.5.1 Convenience of SAP ERP Compared to the Old Systems

The respondents were asked to indicate whether they perceived the SAP ERP to be convenient compared to the old systems. The responses are summarized and presented in figure 4.11 below.

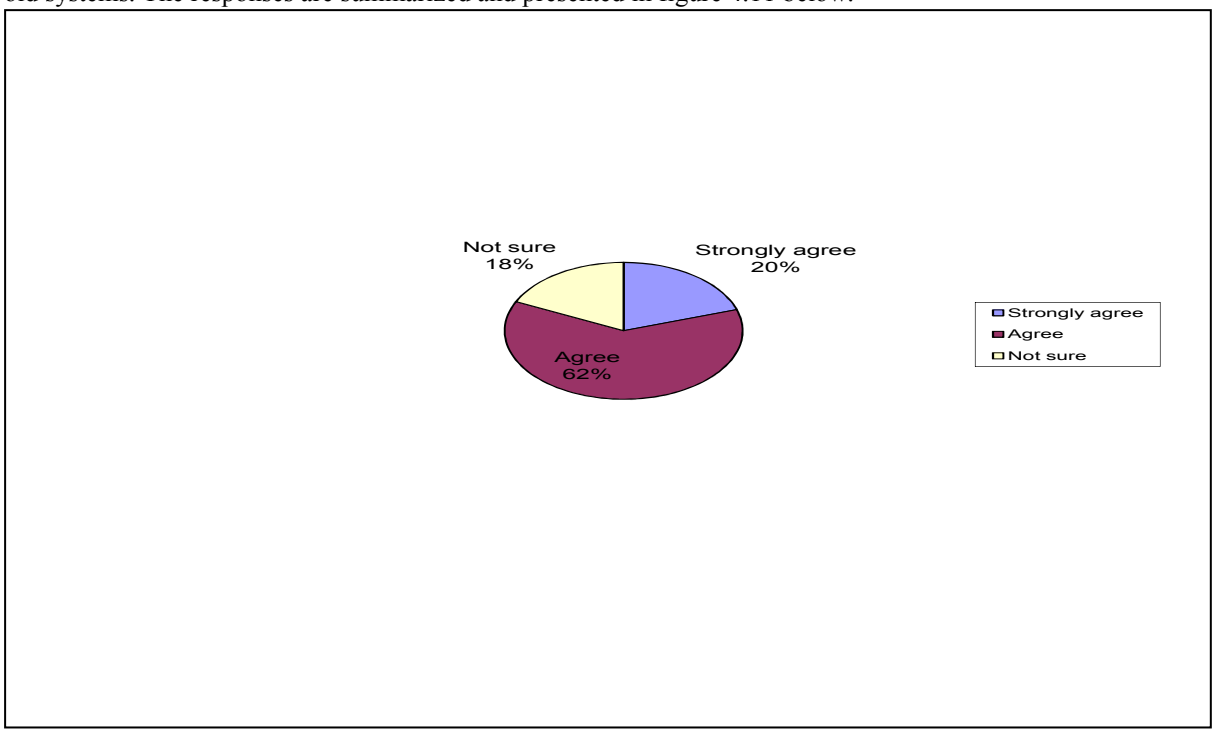


Figure 4.11: Convenience of SAP ERP Compared to the Legacy Old Systems

The responses in figure 4.11 above show that while 20% of the respondents strongly agreed that using SAP ERP is convenient compared to the old systems, 62% agreed and 18% were not sure.

4.5.5.2 Use of SAP ERP to get Information Compared to finding the same information from Other Persons

In response to the statement, "It doesn't bother me to use SAP ERP to get information instead of finding the same information from another person", the responses are summarized and presented in table 4.20 below.

Table 4.20:Use of SAP ERP to get Information Compared to finding the same information from Other Persons

	Response	Frequency	Percent	Cumulative Percent
Responses	Disagree	2	3.3	3.3
	Not sure	18	29.5	33.3
	Agree	33	54.1	88.3
	Strongly agree	7	11.5	100.0
	Missing	1	1.6	
Total		**61**	**100.0**	

The findings in table 4.20 above show that whereas 12% of the respondents strongly agreed with the statement, **"**It doesn't bother me to use SAP ERP to get information instead of finding the same information from another person", 55% agreed, 30% were not sure and 3% disagreed.

4.5.5.3 Embracing of Technology

In response to the statement, "I embrace technology", the findings are summarized and presented in table 4.21 below.

Table 4.21: Embracing of technology

	Response	Frequency	Percent	Cumulative Percent
Responses	Agree	25	41.0	41.7
	Strongly agree	35	57.4	100.0
	Missing	1	1.6	
Total		**61**	**100.0**	

The findings in table 4.21 above show that in response to the statement, **"**I embrace technology", whereas majority of the respondents (58%) strongly agreed, 42% agreed.

4.5.5.4 Security and Confidentiality of Information Entered into SAP ERP

The responses to the statement**, "**the information that I enter into SAP ERP is secure and remains confidential are summarized and presented in table 4.22 below.

4.5.5.5 Table 4.22: Security and Confidentiality of Information Entered into SAP ERP

	Response	Frequency	Percent	Cumulative Percent
Responses	Strongly disagree	1	1.6	1.7
	Disagree	1	1.6	3.3
	Not sure	17	27.9	31.7
	Agree	31	50.8	83.3
	Strongly agree	10	16.4	100.0
	Missing	1	1.6	
Total		**61**	**100.0**	

Findings in table 4.22 above show that to the statement, **"**the information that I enter into SAP ERP is secure and remains confidential", 17% of the respondents strongly agreed, 52% of the respondents agreed, 28% of the respondents were not sure, 2% of the respondents disagreed and 2% strongly disagreed.

4.5.5.5 Dislike for Change

The responses to the statement, **"**I dislike changes in the way I carry out my work", are summarized and presented in table 4.23 below.

Table 4.23: Dislike for Change

	Response	Frequency	Percent	Cumulative Percent
Responses	Strongly disagree	44	72.1	74.6
	Disagree	11	18.0	93.2
	Not sure	1	1.6	94.9
	Agree	3	4.9	100.0
	Missing	2	3.3	
Total		**61**	**100.0**	

The findings in table 4.23 indicate that 75% of the respondents strongly disagreed with the statement, "I dislike changes in the way I carry out my work", 19% of the respondents disagreed, 2% were not sure and 5% agreed".

4.5.5.6 Confidence in Using SAP ERP

The responses to the statement, "I feel confident using SAP for my work" are summarized and presented in table 4.24 below.

Table 4.24: Confidence in Using SAP ERP

	Response	Frequency	Percent	Cumulative Percent
Responses	Disagree	1	1.6	1.7
	Not sure	39	63.9	66.7
	Agree	20	32.8	100.0
	Missing	1	1.6	
Total		**61**	**100.0**	

The findings in table 4.24 above show that whereas 2% of the respondents disagreed, 65% were not sure and 33% agreed.

4.5.5.7 Belief that Transactions Done Using SAP ERP are Correct

The responses to the statement, "I believe that transactions done using SAP ERP are correct" are summarized and presented in table 4.25 below.

4.5.5.8 Table 4.25: Belief that Transactions Done Using SAP ERP are Correct

	Response	Frequency	Percent	Cumulative Percent
Responses	Strongly disagree	1	1.6	1.7
	Not sure	2	3.3	5.0
	Agree	43	70.5	76.7
	Strongly agree	14	23.0	100.0
	Missing	1	1.6	
Total		**61**	**100.0**	

The findings in table 4.25 above show that 23% of the respondents strongly agreed with the statement, "I believe that transactions done using SAP ERP are correct", 72% of the respondents agreed, 3% were not sure and 2% strongly disagreed.

4.5.5.9 The Belief that Many Transactions Cannot be Done by SAP ERP

The responses to the statement, "I feel that a lot of transactions cannot be processed by SAP ERP" are summarized and presented in table 4.26 below.

Table 4.26: The Belief that Many Transactions Cannot be Done by SAP ERP

	Response	Frequency	Percent	Cumulative Percent
Responses	Strongly disagree	10	16.4	16.7
	Disagree	36	59.0	76.7
	Not sure	12	19.7	96.7
	Agree	1	1.6	98.3
	Strongly agree	1	1.6	100.0
	Missing	1	1.6	
Total		**61**	**100.0**	

The findings in table 4.26 above show that 17% of the respondents strongly disagreed with the statement, "I feel that a lot of transactions cannot be processed by SAP ERP", 60% of the respondents disagreed, 20% were not sure, 2% strongly agreed and 2% agreed.

Dislike for Things that are Computerized: The responses to the statement, "I do not prefer things that are computerized" are summarized and presented in table 4.27 below.

Table 4.27: Dislike for things that are Computerized

	Response	Frequency	Percent	Cumulative Percent
Responses	Strongly disagree	44	72.1	73.3
	Disagree	15	24.6	98.3
	Not sure	1	1.6	100.0
	Missing	1	1.6	
Total		**61**	**100.0**	

The findings in table 4.27 above show that 73% of the respondents strongly disagreed with the statement, "I do not prefer things that are computerized", 25% disagreed and 2% were not sure.

Belief that Adequate Help cannot be found when Faced with Problems while Using SAP ERP: The responses to the statement, "I do not feel that I can get adequate help for a problem I face during the use of SAP ERP" are summarized and presented in table 4.28 below.

Table 4.28: Belief that Adequate Help cannot be found when Faced with Problems while Using SAP ERP

	Response	Frequency	Percent	Cumulative Percent
Responses	Strongly disagree	25	41.0	41.7
	Disagree	33	54.1	96.7
	Not sure	2	3.3	100.0
	Missing	1	1.6	
Total		**61**	**100.0**	

The findings in table 4.28 above show that the responses to the statement, "I do not feel that I can get adequate help for a problem I face during the use of SAP ERP", were as follows: 42% of the respondents strongly disagreed, 55% of the respondents disagreed, 3% of the respondents were not sure.

Benefits Derived from Using SAP ERP: The responses to the statement, "I have derived many benefits from using SAP ERP" are summarized and presented in table 4.29 below.

Table 4.29: Benefits derived from Using SAP ERP

	Response	Frequency	Percent	Cumulative Percent
Responses	Not sure	1	1.6	1.7
	Agree	35	57.4	60.0
	Strongly agree	24	39.3	100.00
	Missing	1	1.6	
Total		**61**	**100.0**	

Findings in table 4.29 show that the responses to the statement, "I have derived many benefits from using SAP ERP", are as follows: 2% of the respondents were not sure, 58% of the respondents agreed and 40% of the respondents strongly agreed.

Importance of SAP ERP to the Overall Future of MSC: The responses to the statement, "I feel that SAP ERP is very important to the overall future of MSC" are summarized and presented in table 4.30 below.

Table 4.30: Importance of SAP ERP to the Overall Future of MSC

	Response	Frequency	Percent	Cumulative Percent
Responses	Agree	21	34.4	35.0
	Strongly agree	39	63.9	100.0
	Missing	1	1.6	
Total		**61**	**100.0**	

The findings in table 4.30 above show that whereas majority (65%) of the respondents strongly agreed with the statement, "feel that SAP ERP is very important to the overall future of MSC", 35% of the respondents agreed.

The respondents were asked to make further comments on SAP ERP project implementation. Some of the comments made included: SAP ERP has made work easier; introduction of SAP ERP has enabled the users to handle work comfortable; the respondents suggested that the organization rewards those who participated in the implementation of SAP ERP since they had made a sacrifice; and SAP ERP is user-friendly and had made such operations as out of crop and end year activities easier.

5.0 DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter represents a synopsis of important elements of the study, including the purpose, specific objectives, methodology and finally the major findings of the study. The chapter also represents the discussion and conclusions drawn from the research findings on the factors that affect the adoption of ERP in Mumias Sugar Co. Ltd. Finally, the chapter presents further work for further studies.

5.2 Summary

The purpose of the study was to determine the factors that affect the adoption of ERP systems. The specific objectives of the study were: to establish the role of PEOU of ERP in its adoption; to evaluate the effect of PU of ERP on its adoption; and to determine the effects of individual perception towards the adoption of ERP.

The study focused on Mumias Sugar Company. The population of interest was the employees of the company who are current users of the Systems Applications Product (SAP) ERP, whose number stood at 200 as at 31st December 2009. The respondents were drawn from the three categories of staff as presented in the organizational structure - Heads of departments, Managers and Supervisors. Purposive sampling design was used to select Heads of Departments to participate in the study. Accordingly, all the Heads of departments participated in the study. In addition, stratified random sampling was used to select a representative sample of ERP users from amongst the managers and supervisors in the various departments.

The study utilized a combination of quantitative and qualitative techniques in the collection of primary

and secondary data. A semi-structured questionnaire was the main data collection instrument. The researcher also used interview schedules with open ended questions, aimed at meeting the objectives of the study. Primary data was analyzed by employing descriptive statistics such as percentages and the averages. The statistical Package for Social Sciences (SPSS) was used as an aid in the analysis. The researcher preferred SPSS because of its ability to cover a wide range of the most common statistical and graphical data analysis. Computation of frequencies in tables, charts and bar graphs were also used in data presentation. The information was presented and discussed as per the specific objectives of the study.

With respect to the role of PEOU of ERP in its adoption, the majority of the respondents (82%) had previous computer experience; 67% of the respondents had previous experience with systems other than SAP ERP and 98% of the respondents were current users of the System Applications Product (SAP) ERP. In addition, majority of the respondents, 65% had used for above 22 months, hence the ease of use of SAP ERP by the respondents. The numeric values corresponding to the respondents' personal opinion on ease of use of SAP ERP indicate as follows: Majority of the respondents, 98% were of the view that SAP ERP was easy to use with various attributes; 93% of the respondents had the feeling of comfort when using SAP ERP; 96% of the respondents indicated that SAP ERP was user friendly; 83% of the respondents indicated that SAP ERP transaction processing was fast; and 95% of the respondents indicated that they had the ability to get support when using SAP ERP.

The researcher sought to evaluate the effect of PU of ERP on its adoption by comparing with the old system. The findings show that at least 48% of the respondents had used the old system prior to SAP ERP. The types of users of the SAP ERP amongst the respondents included transaction processing users (52%), approved users (38%), information users (5%) and ICT support users (5%). With respect to importance of SAP ERP in the respondents' careers, majority of the respondents (70%) indicated that it was important. Majority of the respondents (75%) were using SAP ERP on daily basis. With respect to numerical value corresponding to respondents' personal opinion on PU of SAP ERP: Majority of the respondents (72%) indicated that using SAP is convenient compared to the Old Systems; 49% of the respondents indicated that it did not bother them to use SAP ERP to get information instead of finding the same information from another person; 30% of the respondents indicated that they had an opportunity to try various functionalities and access information in SAP ERP form their normal work; 93% of the respondents agreed that SAP ERP had added value to their work; 82% of the respondents indicated that SAP ERP had increased efficiency in their work; 59% of the respondents had the ability to perform most of the functions using SAP ERP; 56% of the respondents indicated that SAP ERP was widely used in Mumias Sugar Company; and 78% of the respondents indicated that SAP ERP was available most of the time. The average perception of PU is therefore approximately 73%.

Findings on the impact of individual attitude towards the adoption of SAP ERP are as follows: All the respondents (100%) indicated that they trusted SAP ERP to be able to process accurately the data they had entered. In addition, all the respondents (100%) indicated that the information they retrieved from the SAP ERP was reliable and that they depended on it to perform their functions. Majority of the respondents (85%) did not have any perceived risks in using SAP ERP. With respect to the numerical value corresponding to personal opinions of the respondents on their attitude on usage of SAP ERP, the findings were that : Out of the 62 respondents that participated in the study, 82% indicated that using SAP ERP is convenient compared to the old systems; 67% of the respondents indicated that it did not bother them to use SAP ERP to get information instead of finding the same information from other persons; all the respondents indicated that they like to make use of technology; 68 % of the respondents indicated that the information they entered into SAP ERP was secure and remained confidential; 93% of the respondents embraced change in the way they did things; 33% of the respondents had confidence in the use of SAP ERP; 95% of the respondents believed that transactions done using SAP ERP were correct; 77% of the respondents indicated that many transactions could be done using SAP ERP; 98% of the respondents indicated that they liked automation or computerization ; 95% of the respondents believed that they could get adequate help when faced with problems while using SAP ERP; 98% of the respondents indicated that they had derived many benefits from using SAP ERP; and all the respondents (100%) felt that SAP ERP is very important to the overall future of MSC.

5.3 Discussions

This section represents a summary of the key findings of the study. The findings are as discussed below.

5.3.1 The role of Perceived Ease of Use (PEOU) of ERP in its adoption

The key findings on the role of perceived ease of use (PEOU) of ERP in its adoption are presented below:

Majority of the respondents had previous computer experience, with 67% of them having had previous experience with systems/applications other than SAP ERP, which include SUN systems, COBOL systems and HR system and were current users of the System Applications Product (SAP) ERP. Previous experience with other systems has, therefore, created a bias and comparison. The respondents were thus knowledgeable on systems. The findings are in line with the argument by Rogers (2003) that the characteristics of an innovation as

perceived by the individual members of a social system can help explain the different adoption rates for that innovation. According to Rogers, there are five characteristics that influence adoption, namely, the competitive edge (the fact that the innovation is perceived as being superior to the element it replaces: compatibility of the technology (with the organization's internal operations and systems); complexity of the technology (understandability and user-friendliness); and observability of its results and its trial ability.

Venkatesh *et al* (2000) asserts that for consumers without previous computer experience, or for those who believe that technology is difficult to use, adoption of these innovations may be thwarted. The findings also indicate that the majority (93%) of the respondents felt comfortable when using SAP ERP and that SAP ERP was user friendly. According to Dabholkar (2000), research evidence supports the consideration of personal contact and perceived risk. Wang *et al* (2001) asserts that consumers who do not feel comfortable with technology will have a greater desire for personal contact. The findings also show that SAP ERP transaction processing was fast and majority of the respondents had the ability to get support when using SAP ERP. Further, Venkatesh *et al.* (2000) noted that technology discomfort, the tendency of an individual to be uneasy, apprehensive, stressed or has anxious feelings about the use of technology is a similar construct to computer anxiety, a variable that has been found to have a negative effect on perceived ease of use. According to Hohmman (2003), usability has been applied to the design of everyday products, as well as entire software systems, including the user interface, supporting documentation and help system.

5.3.2 The effect of Perceived Usefulness (PU) of ERP on its adoption

The findings show that a significant number of the respondents had used the old system prior to SAP ERP and the types of users of the SAP ERP amongst the respondents included transaction processing users, approved users, information users and ICT support users. However, information and IT support users constituted a total of only 10%, hence the need to put the system to more strategic than operational use. According to Agarwal *et al* (2003), the greater the PU of using the ERP system, the more likely it is that ERP system would be adopted. The findings are also in line with the study by Tan and Teo (2000) which indicates that PU is an important factor in determining the adaptation of innovations. Bhattacherjee (2002) asserted that a person's willingness to transact with a particular system is already considered as PU.

The findings also show that majority of the respondents indicated that SAP ERP in their careers and the respondents were using Systems Applications Product SAP ERP on daily basis. The findings are in line with the argument by Al-Gahtani (2001) and Mathwick *et al* (2001) that the degree to which an individual believes that using a particular system would enhance his or her job performance. According to Amoako-Gyampah and Salam (2004), it is anticipated that the ERP system would be adopted by users if they envisaged that the ERP would support their desire to attain performance outcomes. Most of the users believe that SAP boosts their careers and will enhance their job performance.

The findings also show that majority of the respondents (72%) indicated that using SAP is convenient compared to the legacy (old) systems and that the system had added value to their work, besides increasing efficiency in their work. According to Venkatesh *et al*., (2001), technology adoption (or usage) decisions have been typically characterized by a strong productivity orientation. Agarwal and Karahanna (2000) emphasized that the higher chances that the ERP will maintain the existing work environment of users the higher the likelihood it will be accepted. Agarwal and Karahanna further stressed that suitability of the ERP system is important in determining the users' beliefs about PU and PEOU and eventually the acceptance of the technology.

The findings further show that majority of the respondents (59%) had the ability to perform most of the functions using SAP ERP and had the opportunity to try various functionalities and access information in SAP ERP form their normal work. According to Davis (2000), users that consider technology in general difficult to use will rationalize that it is not useful. According to Tan and Teo (2000), measures of PU of technology is considered in terms of increase in productivity, improvement in job performance, enhancement of job effectiveness and usefulness in the job. Rogers (2001) noted that the degree of relative advantage is often expressed as economic profitability, social prestige, and savings in time and effort, immediacy of the reward or as decrease of discomfort. Ceaparu *et al* (2004) concludes that users will persevere in their attempts to reach a goal if it is useful and important to them, even if an application or its documentation is difficult to use.

5.3.3 The effects of individual attitude towards the adoption of ERP

The findings with respect to effects of individual attitude towards the adoption of ERP show that all respondents trusted SAP ERP to be able to process accurately the data they had entered and that the information they retrieved from the SAP ERP was reliable and that they depended on it to perform their functions. Majority of the respondents (85%) did not have any perceived risks in using SAP ERP. According to Bagozzi *et al* (1992), the behavioral theory is centered on attitudes, and this is due to the fact that they are viewed as an important indicator of behavior. Igbaria *et al.* (1995) established that user attitudes showed a direct impact on the success of end-user computing.

Majority of the respondents (82%) held the opinion that using SAP ERP is convenient compared to the Old Systems and that it did not bother them to use SAP ERP to get information instead of finding the same

information from other persons. Besides having a liking for the use of technology, majority of the respondents indicated that the information they entered into SAP ERP was secure, remained confidential and the respondents embraced change in the way they did things. The respondents had confidence in the use of SAP ERP, believed that transactions done using SAP ERP were correct and that many transactions could be done using SAP ERP.

Jackson *et al*. (1997) argues that behavioral variables, attitude being one of them, may be a needed but not adequate criterion for success. Davies *et al* (1989) advanced that argument by stating that attitude per se may not sufficiently determine the individuals' intentions in the work environment when other extraneous factors such as PU are independently considered. According to Taylor *et al*. (1995), the findings can be justified on the basis of the fact that, in the work environment, productivity is paramount, and individual intentions will be shaped on the basis of work performance considerations and not simply preferences based on personal likes or dislikes with regard to forming a behavior.

5.4 Conclusions

The conclusions of the study are presented below.

5.4.1 The role of perceived ease of use (PEOU) of ERP in its adoption

Since the majority of the employees who participated in the study had previous experience with systems/applications other than SAP ERP and were current users of the System Applications Product (SAP) ERP, besides having used the system for a period of at least 22 months, the findings to the study are objective. For consumers without previous computer experience, or for those who believe that technology is difficult to use, adoption of these innovations may be difficult.

Perceived ease of use was a key factor in determining adoption of ERP in Mumias Sugar Company. Once employees embrace change of technology with anticipation for better performance, it is highly likely that they will adopt the new technology with ease. The findings show that that the key characteristics that influence adoption of ERP SAP, among other technologies are: the competitive edge (essentially that the technology is seemingly more advanced compared to the element it replaces), compatibility of the technology; level of understandability and user-friendliness of the technology; and visibility of its results including its trial ability.

SAP ERP is easy to use with various attributes, which was a key attribute in determining its adoption in Mumias Sugar Company. In line with perceived ease of use, other factors that influenced the adoption of SAP ERP in Mumias Sugar Company include the perceived feeling of comfort when using SAP ERP, the user friendliness of SAP ERP, the speed with which SAP ERP processed transactions and the ability of the users to get support when using SAP ERP.

5.4.2 The effect of Perceived Usefulness (PU) of ERP on its adoption

PU is fundamental in determining the organizations adoption of innovations. The higher the perceived usefulness of the ERP system, the higher the chances that it would be adopted. Within Mumias Sugar Company, the compatibility gaps need to be addressed through post implementation analysis and meeting user requirements.

The degree to which an individual believes that using a particular system would enhance his or her job performance enhances chances of adopting the system. In addition, it is anticipated that if the ERP system would assist users in realizing their desired performance output then the users would willingly adopt the ERP system. This is confirmed by the findings, which show that majority of the users in Mumias Sugar Company believed that SAP ERP would enhance their career growth.

The findings show that using SAP ERP is convenient compared to the legacy (old) systems, majority of the users had the ability to perform most of the functions using SAP ERP and that SAP ERP had added value to their work, besides increasing efficiency. Technology adoption (or usage) decisions are characterized by a strong productivity orientation. The greater the compatibility of the ERP with the existing work procedures and ethics of the users the greater the chances of acceptance of the ERP by the users. In fact suitability of the ERP plays a major role in determining beliefs about PU and PEOU and eventually the adoption of the technology. Measures of PU of technology are considered in terms of increase in productivity, improvement in job performance, enhancement of job effectiveness and usefulness in the job.

5.4.3 The effects of individual attitude towards the adoption of ERP

Attitudes are a significant predictor of behavior, as depicted by the study findings, which show that all the users of SAP ERP that participated in the study trusted the system to be able to process accurately the data they had entered and the reliability of the information they retrieved from the SAP ERP, besides not having any perceived risks in using SAP ERP. The transaction users look at ERP from a job security perspective and hence the business case for the system is understated. Though individual attitude is necessary in determining adoption of new technologies, it is not sufficient condition for success. In fact attitude per se may not strongly determine individual intentions in the workplace, which include performance, when other extraneous factors including PU are independently considered.

5.5 Recommendations

The recommendations for policy and practice are presented below.

5.5.1 The role of perceived ease of use (PEOU) of ERP in its adoption

Perceived ease of use is a key determinant of ERP adoption. In order to enhance its success in adoption of the SAP ERP, the following measures are recommended:

The employees who have had experience using the old system should be inducted on the usage of the proposed system so that they can get to know the benefits they would derive by adopting the new system instead of continuing with the old system. The employees should be prepared to adopt new ways of doing things so that resistance to change in adoption of the new technology is minimized.

Before new technologies are introduced, the organization should ensure that the proposed technologies meet the following criteria: that the new technologies have a competitive edge over the technology to be replaced; that the technology is suitable to the firm's internal processes and procedures); level of understandability and user-friendliness of the technology, visibility of the results, and that the proposed technology can be tried before it is adopted.

In addition, before the new technology is introduced, in order to enhance perceived ease of use, there should be perceived feeling of comfort among the users, the system should be user friendly, technically support should be readily available to the users and the speed of transactions should be enhanced.

5.5.2 The effect of Perceived Usefulness (PU) of ERP on its adoption

The higher the perceived usefulness of the ERP system, the greater the chances that the ERP system would be adopted. In order to enhance perceived usefulness of using SAP ERP, the following measures are recommended: MSC should improve on alignment of strategies and operations through the following actions: run the organization in accordance with strategy and plans, accessing the right information in real time to identify concerns early; pursue opportunities proactively; and find the best people and leverage their talent in the right job at the right time.

The new system should be exposed to as many key users as possible, who should then be involved at all stages of development and implementation of the new system. Involvement of the stakeholders would enhance perceived usefulness and hence adoption of the new system. The greater the compatibility of the ERP with the organizations and users work ethics the higher the probability of technology acceptance. Compatibility is very important in influencing beliefs regarding PU and PEOU and eventually the acceptance of new technology. The system should be tailor-made for the organization to ensure comfort in use and with minimum risks to the users.

5.5.3 The effects of individual attitude towards the adoption of ERP

In order to enhance effects of individual attitude towards the adoption of ERP, the following measures are recommended:

Attitudes, being an important predictor of behavior, and hence individual adoption of ERP, should be enhanced by building trust among the users of the perception of the system that it would have the ability to accurately process data and the reliability of the information to be retrieved from the SAP ERP, besides minimizing any perceived risks in using the system.

MSC should strive to reduce costs through increased flexibility by taking the following actions: use ERP architecture to improve process standardization, efficiency, and adaptability; and extend transactions, information, and collaboration functions to the key business areas of the organization.

5.6 Recommended Areas of Further Studies

The findings of this study, it is hoped, will contribute to the existing body of knowledge and form basis for future researchers. The following areas of further researcher are thus suggested: Whereas the current study focused on responses from the users of SAP ERP, future studies should focus on responses from the customers.

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