

**ASSESSMENT OF THE EFFECT OF ENTERPRISE RESOURCE PLANNING ON
PERFORMANCE OF ORGANISATIONS WITHIN THE AGRO-PROCESSING
INDUSTRY IN KENYA:A CASE STUDY OF KTDA FACTORIES IN BOMET COUNTY**

BY

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DECLARATION

This research proposal is my original work and has not been presented for award of a degree in any other University.

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This research proposal has been submitted for examination with my approval as the University supervisor.

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DEDICATION

This work is dedicated to God who is my all in this life. I owe Him everything for my academic achievement. I also dedicate it to my family and my parents.

ABSTRACT

A lot of organizations have adopted and implemented enterprise wide information systems which can be summarized in the term Enterprise Resource Planning (ERP) systems. An ERP system can be characterized as an information system made up of different modules, each supporting the business processes. Enterprise resource planning (ERP) systems affect organizations and are implemented to enhance organizational effectiveness. However, ERP implementation is complex, costly and the research to date on the results of ERP investments on organizational performance have been inconclusive. The primary objective of this study is to assess the relationship between Enterprise Resource Planning (ERP) and organizational performance in the KTDA managed factories in Bomet county. Furthermore, in the light of the aforementioned considerations in the field of enterprise systems, the present study will explore the factors that determine a successful ERP system implementation and organisational performance. The study is also beneficial to companies in other sectors of the economy that may be willing to take advantage of the benefits of ERP in line with organizations strategic decision making. The study will enable them to perceive the best way to approach the subject. The study will be beneficial to researchers, academicians and students pursuing the subject in that it offers valuable insight and a basis for further research. This study is a descriptive research that will employ a case study research design. This is because the study intends to obtain an in depth understanding the impact of enterprise resource planning on organizational performance in the tea processing industry. The target population of this study will include managers and senior staff of production, information technology and human resource departments of KTDA managed factories in Bomet County. A total of 603 respondents will be targeted. Since the study's unit of analysis is at the organization or firm level, the researcher will sample viewpoints of key organizational informants, including senior and mid-level executives from both the business and technological (IT) part of the organization. Both descriptive and inferential statistics will be used to analyze the data. Descriptive analysis will be conducted on primary data. Mean and standard deviations will also be used as measures of central tendencies and dispersion respectively. Data will be presented in the form of frequency distribution tables, graphs and pie charts that will facilitate description and explanation of the study findings.

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ABBREVIATIONS AND ACRONYMS

CT: Contingency Theory

ERP: Enterprise Resource Planning

IS: Information System

ST: Stakeholder Theory

TQM: Total Quality Management

1.8 Definition of Key Terms

Agro-Processing Industry- Agro-processing industry refers to the subset of manufacturing that processes raw materials and intermediate products derived from the agricultural sector.

Agro-processing industry thus means transforming products originating from agriculture.

ERP System- An ERP system is a set of packaged application software modules, with an integrated architecture, that can be used by organizations as their primary engine for integrating data, processes and information technology, in real time, across internal and external value chains (Shang and Seddon, 2002).

Information Systems: These are collection of subsystems defined by either functional or organizational parameters that support decision making and control the organization.

Performance- is a method of measuring the success of the organization to ensure that it achieves its goals. The success of an organization is gauged from several indicators both qualitative and quantitative (Fry et al., 2008). These include financial performance and non-financial performance.

Quality Control: The ISO definition states that *quality control* is the operational techniques and activities that are used to fulfill requirements for quality. This definition implies that any activity whether serving the improvement, control, management or assurance of quality could be a quality control activity.

Labour Allocation: refers to assigning duties to employees or apportioning tasks to labourers based on their skills and areas of specialization.

Facility Layout: Can be defined as placement of departments, work groups within the department, workstations, machines and stock holding points within a facility.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

This chapter contains the background information of the Enterprise Resource Planning (ERP) application on the enterprise and how its implementation can result in improved organisational performance.

Enterprise Resource Planning (ERP) applications are software suites that help organizations integrate their information flow and business processes. They typically support the different departments and functions in the organization by using a single database that collects and stores data in real time. When ERP systems are fully realized in a business organization, they can yield many benefits: reduce cycle time, enable faster information transactions, facilitate better financial management, lay groundwork for e-commerce, and make tacit knowledge explicit (Davenport, 2011). Since the potential benefits are large, many organizations are willing to undertake the difficult process of converting from whatever they currently use to an ERP system.

A lot of organizations have adopted and implemented enterprise wide information systems which can be summarized in the term Enterprise Resource Planning (ERP) systems. An ERP system can be characterized as an information system made up of different modules, each supporting the business processes. The modules are integrated and all gathered data are stored in a central database (Aernoudts, Boom, Pijl, & Vosselman, 2005). The fact that all data are centrally stored makes it possible to extract data into information.

Theoretically, many more data and indirect information become available to the organization and to the people within the organization. Due to this effect business advantages can be expected. Because data become widely available, it is possible to use these data in order to

control an organization. An example of this mechanism is the possibility of single storage of data, which can prevent unwished redundancy. Other advantages are the real-time storage of business process data and the business wide availability of data. These assumed advantages are the main reasons for organizations to implement such ERP systems. In an environment where organizations more and more depend on information technology, they want to remain competitive (Spathis & Constantinides, 2004).

Organizations expect that ERP will create competitive advantages. In assuming that ERP create advantages, it is necessary to know what effects it has on an organizational performance. A lot of research is conducted into implementation issues and success and fail factors of ERP. ERP systems support business processes and can be used as a tool to help to realize other goals. It is interesting to see what the impact of ERP systems is on the organization, or what relations exist between ERP and management control. One specific aspect of management control is the area of Performance Management. Talking about managing performance, the next question that presents itself is: what exactly is meant by performance and how can performance be measured. ERP systems store all process data in a single database, so we could assume that ERP systems offer opportunities for better organizational performance.

1.1.1 Overview of Kenya Tea Development Authority (KTDA)

Kenya Tea Development Agency Holdings (KTDA) provides comprehensive services to small tea farmers such as agri-extension, transportation, processing, and marketing. It has six subsidiaries including the KTDA Management Services Ltd. which oversees 54 companies that collectively own 65 tea processing factories in which small farmers are shareholders.

Kenya is the leading producer of tea in Africa and third in the world. The vast majority of tea is grown on small farms. KTDA staff train farmers to improve the productivity and quality of tea yields through techniques such as planting, weeding, and fine-plucking. KTDA also trains farmers in sustainable agriculture practices and helps them meet the requirements for Rainforest Alliance certification. Training topics include agronomic practices, climate change adaptation (e.g. crop diversification) and mitigation (e.g. planting indigenous trees), soil conservation, and water management. Farmers deliver tea to KTDA buying centers where it is weighed, graded, and valued. A mobile application-based IT system is used to transmit data on tea deliveries to factories and the information is used to pay farmers. Tea is transported from buying centers to factories where it is processed, packaged, and transported for sale in both domestic and export markets.

1.2 Statement of the Problem

Companies are under tremendous pressure to ensure continuity of key operations with fewer resources. Many companies look to their enterprise resource planning (ERP) systems to find efficiencies, improve processes, reduce complexity, integrate systems, and eliminate redundancy. Despite ERP's promises to benefit companies and a substantial capital investment, not all ERP implementations have successful outcomes. ERP implementations commonly have delayed an estimated schedule and overrun an initial budget (Ehie & Madsen, 2005). Many organizations have not been able to reap full benefits of ERP leading to frustrations. When users become frustrated with ERP, business units and individual users may develop their own solutions and methodologies for buying, managing, and tracking resources. These solo strategies can negate the benefits that an ERP system provides, including centralized planning, procurement, and financial reporting. If users or business groups do not participate by submitting up-to-date data, the ERP may not be able to generate accurate, timely information for dashboards and other reports for leaders and other decision-makers.

Furthermore, the literature indicates that ERP implementations have sometimes failed to achieve the organization's targets and desired outcomes. Much of the research reported that the failure of ERP implementations was not caused by the ERP software itself, but rather by a high degree of complexity from the massive changes ERP causes in organizations (Madinios, Chatzoudes & Tsairidis, 2012).

Enterprise resource planning (ERP) systems have affected KTDA and are implemented to enhance organizational effectiveness. However, ERP implementation is complex, costly and the research to date on the results of ERP investments on organizational performance have been inconclusive. These risk factors related to ERP adoption and implementation in KTDA illustrates various organizational considerations: organization fit, skill mix, project management and control, software system design, user involvement and training, and technology planning.

Empirical evidence reveals that little research attention has been devoted to measuring the impact of ERP in agro-processing industry. This lacuna of knowledge is unjustifiable because the implementation of ERP is a source of increasing cost and concern to management, especially in the agro processing sector. It is against this background that the goal of this study will be to discover the impact of ERP systems implementation on organizational performance by measuring the impact of an ERP on organizational performance in KTDA.

1.3 General Objective

The primary objective of this study will be to assess the relationship between Enterprise Resource Planning (ERP) and organizational performance in the agro-processing industry.

1.3.1 Specific Objectives

The specific objectives of the study will include the following:

- i) To determine the effects of information system on organizational performance in KTDA
- ii) To find out the influence of quality control on organizational performance in KTDA
- iii) To establish the relationship between labour allocation and organizational performance in KTDA
- iv) To find out the effect of facility layout on organizational performance in KTDA

1.4 Research Questions

The study will seek information to answer the following questions:

- i) What are the effects of information system on organizational performance in KTDA?
- ii) How does quality control influence organizational performance in KTDA?
- iii) What is the relationship between labour allocation and organizational performance in KTDA?
- iv) What are the effects of facility layout on organizational performance in KTDA?

1.5 Significance of the Study

This study adds to the body of knowledge in the area of information technology and ERPs and its results can contribute to improved decision-making and setting ERP expectations at the time of ERP purchase and implementation. Future researchers can use the financial performance measures used in this study to develop formal measures to assess the organization performance of future adopters of ERP systems.

The study is also beneficial to companies in other sectors of the economy that may be willing to take advantage of the benefits of ERP in line with organizations strategic decision making. They study will enable them to perceive the best way to approach the subject.

The study will be beneficial to researchers, academicians and students pursuing the subject in that it offers valuable insight and a basis for further research.

1.6 Scope of the Study

The scope of the study will be to assess the relationship between Enterprise Resource Planning (ERP) and organizational performance in the agro-processing industry. Furthermore the present study will explore the factors that determine a successful ERP system implementation and its effect in organisational performance. The study will use Kenya Tea Development Authority as the case study, specifically focusing on Tea Factories in Bomet.

1.7 Limitations of the Study

The researcher expects to encounter challenges in securing the employees precious time considering their busy working schedules. The researcher also will make use of proper arrangements with the respondents to avail themselves for the study off-time hours as well as impressing the staff on the value of the study. The researcher will exercise utmost patience and care and in view of this, the researcher will make every effort possible so as to acquire sufficient data from respondents. Further, the researcher will face a shortage of literature on the ERP use in agro-processing industry. This will be mitigated by seeking for the information from the already documented materials and also from the useful online articles. The data collected will be descriptive, which allow for only observational data to be collected. The conclusions that will be made in this study are only on the observed population. This research will not use simple random sampling due to limited number of respondents and low return rate of online survey. Therefore data is not truly accurate of a larger population. The study will also use closed answer questions which prohibit deeper analysis on the reasoning of respondents' answers.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction to Literature Review

This chapter looks at the issues related to the influence of ERP on organisational performance. The chapter develops a theoretical framework to justify the need for the current study, conceptual framework to guide the study discussion and the empirical review on the relationship between Enterprise Resource Planning (ERP) and organizational performance. The chapter also looks at the research gaps.

2.2 Empirical Review/Theoretical Review

2.2.1 Performance

Firm performance is one of the most important constructs in management research. The definition of firm performance could vary from one and another. According to Richard et al. (2009) organizational performance encompasses three specific areas of firm outcomes: financial performance (profits, return on assets, return on investment, etc.); product market performance (sales, market share, etc.); and shareholder return (total shareholder return, economic value added, etc.) On the other hand, firm performance can also be measured using perceived performance approach (also referred to as subjective performance measure) where Likert-like scaling is used to measure firm performance from the top management perspectives (Selvarajan, 2007).

Organizational performance is a method of measuring the success of the organization to ensure that it achieves its goals. The success of an organization is gauged from several indicators both qualitative and quantitative (Fry et al., 2008). These include financial performance and non-

financial performance. Performance measures may be cost-oriented or non-cost oriented and can be internal or external. Although organizational performance is the most extensively used dependent variable in organizational research, it still remains vague and loosely defined. Performance has been traditionally conceptualized in terms of financial measures; but some scholars have proposed a broader performance construct that incorporates non-financial measures including among others market share, product quality, and company image.

Financial measures of performance are criticized for lacking neutrality (Emmanuel et al., 1990); and encouraging short-termism (Wilson & Chau, 1993). Most management practices built around financial measures bear little relation to a company's progress in achieving long-term objectives. Financial measures are also criticized for lacking balance because they are more concerned with physical assets and ignore, for instance, perspectives of customers, and internal business processes. All these perspectives are necessary under the circumstances where companies transform themselves for competition based on information.

Under the circumstances, non-financial measures of performance have also been used to gauge the performance of a firm (Kaplan & Norton, 2009). Some studies (Youndt et al., 2006) suggest asking managers to assess their own firm's performance relative to others in the same industry or sector. They suggest the use of multiple items and multiple respondents to assess performance. This study opts to use multiple items in order to assess the performance of the organizations under study. The items are both cost and non cost oriented including: quality of product, company image, interpersonal relations, return on assets and return on equity.

2.2.2 Enterprise Resource Planning and Organisational Performance

ERP software integrates information used by the accounting, process, distribution, and human resources departments into a seamless computing system (Jaidep Motwani, etal 2005). The

business world's embrace of enterprise systems may in fact be the most important development in the corporate use of information technology in the 2000s. ERP systems specifically address the need for integration of application programs for various business functions or processes in a processing firm, such as sales, accounting and process. Different business applications can all use a common database that serves as the integrating mechanism (John Olhager, et al, 2003).

ERP systems are expected to provide at least in theory, seamless integration of processes across functional areas with improved workflow, standardization of various business practices, improved order management, accurate accounting of inventory, and better supply chain management (Mabert, et al, 2000). ERP arrived at a time when process improvement and accuracy of information became critical strategic issues. The emphasis on supply chain management and the advancement of information technology created a need for enterprise-wide integration. In the past few years, ERP has become a "must have" system for almost every firm to improve competitiveness. Today, over 60% of companies have installed or plan to install a packaged ERP system (Hsiuju Rebecca Yen, Chewn Sheu, 2003).

Evidence from a survey on companies who have adopted ERP systems and their impact on management practice confirms a number of such benefits. The most highly-rated perceived benefits involve increased flexibility in information generation, improved quality of reports, increased integration of accounts applications and improved decisions based on timely and reliable accounting information. Evidence suggests that businesses expect ERP systems to deliver improved company performance (Charalambos Spathis, et al, 2005). Therefore, it is highly unlikely that any two implementations will have identical requirements or consequences, even if they are based on the same generic software packages. While the

potential benefits might be articulated, determination of the actual benefits from implementing an ERP system is difficult to foresee.

Many managers doubt to gaining value and competitive advantages from ERP systems (Keng Siau, 2002). The main reason of organizations is objectives and acquires effectiveness (Daft, 2003). ERP systems are by many regarded as a dream come true and are in most cases implemented in order to improve organizational effectiveness. Some studies also described cases where the implementation failed and the impact had the opposite effect on organizational performance. However, ERP systems are huge and complex and have a different implementation results. In the other hand, the effectiveness is multiconcept and complicated to measurement. (S.C. Lenny Koh, 2006).It includes strategic, operational, human resource and structural properties of organization.

The literature points that assessment of benefits and risks of ERP has remained of strategic interest to the adopting organisations. Achieving operational efficiencies such as improvements in productivity, optimising inventory and data integration capabilities are some of the prime benefits being sought by ERP adopters (Kamhawi 2008). In investigating adoption motives, Raymond and Uwizeyemungu (2007) conclude in their study of Canadian Small & Medium enterprises (SMEs), that the firms with significant organisational capacities, commercial dependence on major customers and tendency of bringing innovative products are internally predisposed to ERP adoption, whereas those firms which are focused on networking and partnerships with other firms are externally pre-disposed towards adoption of ERP. Unfavourably disposed firms are profiled as having less conducive environmental, organisational and technological tendencies towards the adoption of ERP.

Kamhawi (2008) finds that gaining strategic management and decision making capabilities are the main themes influencing ERP adoption decision, whereas startup costs and availability of resources are the main challenges to adoption of ERP. The findings indeed confirm the standpoint of Huang and Palvia's (2001) study in which they highlight the differences in challenges in adopting ERP, in developing and developed countries. Huang and Palvia (2001) find that the firms in developing countries face various cultural, economic and infrastructure challenges to adoption of ERP in contrast to their developed countries counterparts.

However, Buonanno et al. (2005) contradict this position and conclude that firms do not regard financial constraints as the impediment to ERP adoption, but consider organisational and structural factors as the main influencing reasons thereof.

Given the considerable investment of time, money and resources in ERP projects, the researchers have looked at the performance impacts of ERP in a post adoption scenario. Conducting a survey of Hong Kong based firms, Law and Ngai (2007) find that user satisfaction of ERP and business process improvement positively impacts the organisational performance. They claim positive empirical relationship between the strategic intent behind the adoption of ERP and organisational performance. Velcu's (2007) study reinforces the above findings, as the study reveals that firms driven by technologically-led motives versus business-led motives perceive differently towards benefits of adopting ERP.

2.2.3 Theories of ERP

According to Kothari (2004), a theory is a coherent group of tested propositions commonly regarded as correct that can be used as principles of explanation and prediction for class of phenomena. In line with this definition, the study will use two theories that help explain the arguments advanced in this study. The theoretical framework of the study is a structure that can hold or support a theory of a research work.

The study will be guided by contingency theory. In this study, as the two levels in the research framework are composed of contextual factors or contingencies such as size, culture, structure, and so forth. The researcher asserts that the Contingency Theory (CT) developed by Lawrence and Lorsch (1967) is particularly relevant to this study. The Contingency Theory posits that organizational effectiveness (in this instance ERP effectiveness or success) can result from the matching of organizational characteristics with contingency factors. About a decade ago and earlier, this theory was the most dominant in the IS and Management Science literature. Weill and Olson, (1989, p.59) note “Of the 177 articles during the period studied, 59 percent were empirical and over 70 percent of these were judged to follow a contingency model.” The authors also highlighted the shortcomings in CT; these include its limitations in explaining interactions between variables, which at best it merely describes. CT assumes the existence of rational actors and often researchers using it narrow their focus to deterministic models (i.e., only the arrows representing a required association are shown and the effects of other factors are ignored) (Weill & Olson, 1989). Due to the limitations in CT and its gradually diminishing influence among researchers in IS and related field, Weill and Olson (1989) encourage the use of other theories to explain aspects of organizational behavior.

With respect to the research framework, another theoretical base that can arguably be considered relevant is the Stakeholder Theory (ST) that was proposed by Freeman (1984). ST posits that sustainable success rests upon a systematic consideration of the views of all key stakeholders of which organizations are made up (Pouloudi & Whitley, 1997; Lyytinen et al., 1998). The Stakeholder Theory considers two perspectives: inside-in (employees, managers) and inside-out (others: shareholders, partners). In the extent IS literature, stakeholders have been identified based on a particular research purpose. For example, Lyytinen et al (1998)

describe stakeholders as actors that can set forward claims or benefit from IT systems development issues. Singletary et al. (2003) identified stakeholders as managers, IT professionals, and end users. Thus, ST could facilitate insights when ERP success is to be discussed from the point of view of differing organizational stakeholder groups, which appear to be similar to the dictates of the organizational performance literature in which “the perspective of the evaluator” is esteemed (Cameron, 1986). However, there are shortcomings in ST as well.

Due to its origins, it tends to focus more on control and governance structures in corporations than on how organizational actors relate with each other. In discussing the cracks in ST, Weiss (2006, p.5) asserts that “ST grounds its view of the moral issues surrounding the enterprise in the issue of the control and governance of large corporations.” Phillips (2004) sums the limitations of ST by noting that historically ST has been plagued by questions on how to allocate management resources, including time, energy, etc. to other stakeholder groups in the corporation. He adds “While there is no determinate algorithm, ST can provide some broad direction on making these decisions”

2.2.4 Information System

This research adopts an explanation of an information system that supports the basic concepts of what constitutes an ERP system. In the view of Iivari (1991) an Information System is a collection of subsystems defined by either functional or organizational parameters that support decision making and control the organization. Lucas (1981) highlights the fact that information technology is used to capture, transmit, store, retrieve, manipulate, or display information in one or more businesses. An Information system in an organization provides processes and information useful to its members and clients. It helps it to operate more effectively. The information concerns its customers, suppliers, products, procedures, operations and so on

(Avison and Fitzgerald, 2006). The role of IS in an organization are increasing and encompassing all the various activities and the developments approaches have to take these growing considerations into account. According to Chang and King (2005), the Information Systems can be defined as an integration of hardware, software, human skills and management processes that enhance IS performance to maximize the returns on investment. Furthermore, Information systems combine people, hardware, software, data and networks to perform input, processing, output and control activates (O'Brien, 2004).

The IS implementation and integration is a very complex process and broad systems are employed to their organizational structure for transformation. Jarvinen (1991) found the IS field is very broad, with a number of different definitions depending on the researchers point of view and an ERP system is considered as that vast information system that integrates all the information that runs through the organization into a uniform system (Davenport, 2008). In addition to this, the material relevant to IS frameworks and methodologies and its consequent outcomes has also been reviewed and the best methodology selected based on the desired outcome of this research study.

Technology plays a key role in today's business environment. Many companies greatly rely on computers and software to provide accurate information to effectively manage their business. It is becoming increasingly necessary for all businesses to incorporate information technology solutions to operate successfully. One way that many corporations have adopted information technology on a large scale is by installing Enterprise Resource Planning (ERP) systems to accomplish their business transaction and data processing needs. Enterprise Resource Planning (ERP) systems are software packages that use relational database technology to integrate various units of an organization's information system. ERP systems provide several

separate, but integrated modules, which can be installed as a package for any organization (Scapens and Jazayeri 1998). Many large corporations use several different and separate information systems, often because they have merged with and/or acquired other companies with varied systems. An ERP system integrates these separate information systems and results in improved data reliability and processing efficiency. ERP systems quickly became popular with large corporations that needed a seamless integration of their business, but are now frequently used by small to mid-sized companies. The excellent ability of ERP systems to simplify business transaction processing, eliminate work that adds little or no value, and simultaneously improve customer service are the main reasons for the outstanding success and popularity of these systems (Gibbs 1997). ERP systems have made legacy systems outdated and obsolete for many companies.

2.2.5 Quality Control

Any organization is a system of interrelated units. For total quality management (TQM) to succeed, all of the components within the organization must be collectively involved. Initially, organizations implemented TQM in the hope that improvement in the shop-floor activities would solve all existing productivity and quality problems. Later, they have realized that TQM is much more than just shop-floor improvements. The definitions of quality incorporate factors like top management commitment, leadership, team work, training and development, rewards and recognition, involvement and empowerment of employees etc. These critical factors are the foundation for transformational orientation to create a sustainable improvement culture for competitive advantage on a continuous basis.

According to Selladurai Raj, quality control interventions or activities must be guided by four change principles, namely work processes, variability, analysis, and continuous improvement. Product design and production processes must be improved; variance must be controlled to

ensure high quality; data must be systematically collected and analyzed in a problem-solving cycle; and commitment made to continuous learning by the employees about their work.

Over the past few decades, although ERP initiatives and quality management programs have evolved independently from one another, both are considered as resources that require senior leadership commitment, high levels of investment and organizational effort, that help organizations to gain competitive advantage. It is very much important to look at how ERP integrates with the concept of quality control in any organization and has to be part of the corporate strategy for an organization for gaining a competitive advantage in the long run.

The quality movement has gone through many transformations. In the past, controlling quality meant that the product had to be inspected after it was produced to check whether it met all the specifications or not. The transformation from inspection mode to prevention mode is considered to be a very important step in building quality from the very beginning or start of the manufacturing process. The quality movement saw focus on building quality in every task that is performed in an organization. Therefore, we see a dramatic shift in the quality management focus from just a concentration on manufacturing, to a companywide activities and, more specifically, to the needs of the internal and external customers. Empirical evidence have shown the benefits of implementing quality initiatives. This has helped identify a set of critical factors for successful quality management implementation, as a way to improve customer satisfaction and performance. Critical success factors (CSFs) consist of activities, which must be completed to achieve the organizational vision and objectives. Literature reveals that if organisations focus on the management of these critical factors, improvements in quality performance and its reflection in financial results is bound to happen. Wali, Deshmukh and Gupta (2003) have made an attempt to synthesize various critical factors given

by authors in the form of a table. Although the factors and the approach may vary from author to author, eventually it leads to the same goal i.e. continuous improvement.

Some of the critical factors that have been discussed by researchers are top management leadership for quality, supply quality management, process management, employee training, and employee involvement (Wali, Deshmukh and Gupta, 2003). TQM implementation involves a blend of hard and soft quality factors. Soft quality factors are intangible and difficult to measure, and are primarily related to leadership and employee involvement. Hard quality factors, on the other hand, refer to systems, tools and techniques, such as those impact internal efficiency (eg. quality management systems, cost of quality and statistical process control) and external effectiveness (eg. benchmarking and customer satisfaction surveys) (Momoh, Roy and Shehab 2010).

Martisons and Hempel, (2011) based on their study on Australian organisations lists factors that are likely to contribute to the success of quality control implementation. Identification of the strategic direction of the business (i.e. senior management having a clear and uniform understanding of the mission, vision and policies of the organisation) is most important. Determination of customer expectations and measurement of perception (i.e. identification of customer expectations and communicating the same throughout the organisation) is a must. A well defined strategy for quality control implementation (time-frame, resources, training and supportive organisational structure) is also important. Most of the quality control structure consist a steering committee, followed by one or more layers of improvement teams. The steering committee has the responsibility to plan the implementation and monitor the progress. Improvement teams carry out the improvements and report results. It is seen that some organisations invite participation from lower levels of management to increase employee

involvement. Each improvement team has a sponsor, usually a senior manager. This linkage assures senior management commitment and ownership to the improvement teams. Installation of quality assurance system (ISO 9000, other standards) and use of external systems play important role in TQM implementation.

2.2.6 Labour Allocation

The improvement of enterprise's performance relies on the success of the implemented reengineering and integration projects. Usually, these projects are complex in nature and using human resources in appropriate manner is a key for a success in such projects (Hawa, 2012; May and Kettelhut 2006). Many other researchers (Sumner 2000; Welti 2009; Holland et al 2009) have listed labour allocation issues in their critical success factors recommendations when dealing with ERP projects. Therefore, it is important to understand the different parties involved in such projects. The human activity issues and problems that companies are encountering should be looked from the different sides of the staff, internal and external experts, system professionals, management, vendors, users and other people involved in such projects. Also the skills people possess influence the outcome of the ERP project.

Several studies have showed that it is essential to have people with right set of business and IT skills to assure the success of a project (Skok and Legge 2012; Wateridge 2007).

Hawa et al (2012) pointed out that the improvement of an enterprise relies on the success of software engineering projects, which respectively depends on the human resources. The study analysed the basic human requirements for the successful use of ERP in agro-processing industry concentrating on the labour allocation in terms of know-how, profiles and roles of the project team members, and the ways of improving those. Focusing on the human competences has a direct impact on the outcome.

The success of the ERP use depends largely on the quality of the labour and therefore, the best human resources must be made available for the project. The management team members have to be skilled individuals, capable, qualified and with high learning potentials because of the complexity and high standard of the ERP project. The management has to have authority and control over all the aspects, to be able to act quickly, effectively and independently on problems without constraints from the organisation side. The organisational leaders have to have effective leadership skills such as clarity of vision, credible communication and interpersonal skills, sincerity, self-mastery and high levels of motivation and physical energy (Stewart et al, 2010). The stronger it is the faster and more successful is the implementation of the ERP. In addition, the improvement of the quality and co-operation of the teams can be improved through education and training.

2.2.7 Facility Layout

Existing work on facility layout optimization seems to concentrate more on the problem of solving the layouting scenario with fully parameterized models than treating the question about getting the parameters. In the view of the authors, to gather the right data and configure the models requires a deep understanding of the processes under consideration. The task of obtaining the flow values is not always a trivial one and there are several obstacles present that one has to overcome.

Benjafer (2002) shows the difficulty still present with the “simplified” view on layout optimization as a quadratic assignment problem (QAP). The assumption that shorter connecting paths are beneficial to the underlying plant does not hold in all cases. Several situations are shown in which the work in process (WIP) increases while the formulation of the QAP attributes the layout a better fitness. The study concludes that even departments without

material flows can have a strong relationship e.g. when they share the same material handling resource. McKendall and Hakobyan (2009) investigate the case of dynamic facility layouting problems that is they consider rearrangement costs as well as material handling costs when optimizing over several periods with different flow characteristics. In the 2006 article they describe two simulated annealing metaheuristics with look-ahead/look-back strategies adapted to the dynamic facility layout problem that they test on a problem instance taken from the literature.

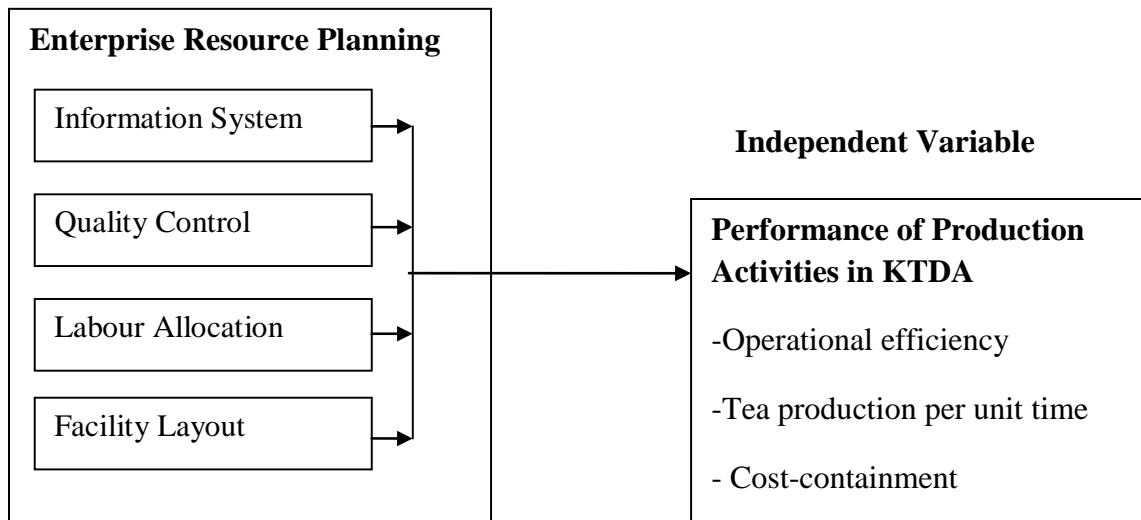
ERP systems hold the relevant data for the operation of manufacturing companies. Common to most implementations is the notion of a *job* that is split into several *operations* which are performed using several resources. A job results in a product or material which can be added to the company warehouse or which is finished and shipped to the customer. The operations describe basic tasks that need to be completed to finish such a job and are executed in a given order. Operations are not limited to production tasks; they may also include management tasks such as monitoring or coaching. Operations can be visualized via a connected graph that provides information on the predecessor successor relationship between them. Any given operation may have multiple successor and multiple predecessor operations.

The resources that are used to perform the operations range from manpower to machines, raw materials and tools. While job and operations are abstract concepts resources are real. For the purpose of layout optimization some of these resources are considered part of the optimization such as manpower, machines. These are assumed to be grouped and available at fixed locations, but there is a demand of raw materials and tools that flows between the locations or warehouses. This demand holds information about which materials flow in the production facility (Spathis and Constantinides, 2004).

2.3 Conceptual Framework

A conceptual framework is a tool researchers use to guide their inquiry; it is a set of ideas used to structure the research, a sort of a map (Kothari, 2004). It is the researcher's own position on the problem and gives direction to the study. It may be an adaptation of a model used in a previous study, with modifications to suit the inquiry. Aside from showing the direction of the study, through the conceptual framework, the researcher can be able to show the relationships of the different constructs that he wants to investigate. The study will be guided by the following conceptual framework.

Figure 2.1: Conceptual Framework
Dependent Variables



The conceptual framework shows the relationship between variables that affect performance of production activities in KTDA. The researchers argue that there is a relationship between information system, quality control, labour allocation facility layout as the dependent variables and the dependent variable (Performance of Production Activities in KTDA).

2.4 Critical Review

Poston and Grabski (2001) examined financial impact of ERP implementations. The results indicate no significant change in costs as a percentage of revenue until the fourth year. Moreover, a significant decrease in costs only for cost of goods sold as a percentage of sales was shown. On the other hand, there were no significant decreases associated with selling, general, and administrative costs scaled by revenues. However, there was a significant decrease in the number of employees as a percentage of revenue all 3 years after ERP implementation. These findings based on practice contradict with the theory behind ERP and creates a paradox suggesting additional complexities surround ERP technology.

Hunton, Lippincott and Reck (2003) researched organisation performance of ERP adopters and non-adopters. Results indicate that return on assets (ROA), return on investment (ROI), and asset turnover (ATO) were significantly better after the third year for adopters, as compared to non-adopters. Their results were consistent with Poston and Grabski (2001), who reported no pre-to post-adoption improvement in financial performance for ERP firms. However remarkable differences arise between the two studies in financial performance. Non-adopters financial performance decreased over time while it held steady for adopters. The theory suggests that ERP system implementation has better impact on larger organizations (Bradford and Frorin, 2003) , however, Hunton, Lippincott and Reck (2003) proven in practice that “for relatively large ERP-adopting firms, there will be a significant negative association between firm health and performance”.

Prior research has shown that conflict with consultants is one of the main managerial problems during the implementation period of ERP system (Chang and King, 2005). Consultants can bring to the organisation specialised skills, experience, and know-how that the organisation

needs when it is both time-consuming and expensive for it to build internally (Davenport, 2011)). They can also offer a firm-wide view, encourage unity between members, and they are usually neutral (Kamhawi, 2008).

In a long-term examination of differences between ERP adopters and non-adopters, Nicolaou (2004a) reported that a lag of at least 2 years was necessary before adopters would begin to demonstrate positive differential financial performance in comparison to their non-adopting peers. While the time lag may partly explain the results obtained by Poston and Grabski (2000, 2001), a number of conditions were also found to moderate the degree to which use of ERP systems would result in positive differential returns for adopting organizations.

2.5 Research Gap

Researchers have investigated many issues related to ERPs ranging from pre-implementation requirements to successfully implement ERP projects with minimum costs. More specifically, to date, lots of studies have been conducted about critical success factors of ERPs, their various implementation steps, related problems, conditions of success and reasons of failure (Basoglu et al. 2007; Botta-Genoulaz and Millet 2006; Botta- Genoulaz et al. 2005; Somers et al. 2000). Among these studies user adoption and system use also have been investigated (Gyampah 2004; Calisir and Calisir 2004). Within the streams of several previous studies user aspects have been mentioned as a crucial factor when studying IS, particularly in terms of ERP systems. The studies however failed to critically assess the effect of ERP on organizational performance.

Empirical evidence reveals that little research attention has been devoted to measuring the impact of ERP in agro-processing industry. This lacuna of knowledge is unjustifiable because the implementation of ERP is a source of increasing cost and concern to management,

especially in the agro processing sector. It is against this background that the goal of this study will be to discover the impact of ERP systems implementation on organizational performance by measuring the impact of an ERP on organizational performance in KTDA.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the methods and processes that shall be followed by the researcher to conduct the study. This section outlines the study's research design, target population, data collection instrumentation, testing for validity and reliability, data collection procedure and methods of data analysis and presentation of results.

3.2 Research Design

Cooper and Schindler (2003) summarizes the essentials of research design as an activity and a time based plan; always based on the research question; guides the selection of sources and types of information; framework for specifying the relationship among the study variables and outlines the procedures for every research. The research design is therefore the blueprint that enables the investigator to come up with solutions to problems and guides in the various stages of research.

This study is a descriptive research that will employ a case study research design. This is because the study intends to obtain an in depth understanding the impact of enterprise resource planning on organizational performance in the agro-processing industry.

3.3 The target Population

Mugenda and Mugenda (1999) indicated that target population should be explicitly and unequivocally defined, otherwise statements about the target population after the analysis of data will not be trustworthy. The target population of this study will include managers and staff of production, information technology and human resource departments of six factories in

Bomet County. This includes: Mogogosiek, Kapkoros, Kapset, Tirgaga, Kobel, and Rorok. A total of 603 respondents will be targeted. Table 3.1 shows the population in the various factories in Bomet County.

Table 3.1: Target Population

Factories	Population	Percentage
Mogogosiek	112	18.57
Kapkoros	107	17.74
Kapset	102	16.92
Tirgaga	98	16.25
Kobel	95	15.75
Rorok	89	14.77
Total	603	100

Source: Factory data

3.4 Sample Design

Since the study's unit of analysis is at the organization or firm level, the researcher will sample viewpoints of key organizational informants, including senior and mid-level executives from both the business and technological (IT) part of the organization. These groups of respondents have been described as being among the most knowledgeable informants regarding ERP systems success evaluations in adopting organizations (Gable et al., 2003; Sedera et al., 2003a, b). Thus, the perspective being presented in this will exclude junior organizational employees.

The study will adopt stratified random sampling. The selected departments/sections will form the strata. The departmental heads/managers will be purposively sampled while the staff will be randomly selected. The sample size will comprise of 61 respondents from a population of

603 which represents 10% of the target population which fulfils the minimum threshold sample.

Table 3.2: Sample Design

Factories	Population	Percentage	Sample size
Mogogosiek	112	0.1	11
Kapkoros	107	0.1	11
Kapset	102	0.1	10
Tirgaga	98	0.1	10
Kobel	95	0.1	10
Rorok	89	0.1	9
Total	603	0.1	61

Source: Factory data

3.5 Data Collection Tools and Techniques

The research instruments to be used in this study will be the questionnaires. Data of this study will be collected through a questionnaire distributed among managers and staff of procurement and logistics, information technology and customer service. The researcher will develop the questionnaires based on the research questions. The questionnaires will consist of both open and closed ended questions to be answered by the respondents. Open ended questions will seek to achieve in-depth responses from the subjects while closed ended responses will remain controlled for the sake of analysis.

3.6 Pilot Test

Before actual data collection, a pilot study will be conducted. The pilot data will not be included in the actual study and will allow for pre-testing of the research instrument. Pre-testing of the questionnaire provides the opportunity to refine the questionnaire by revealing

errors in the questions, sequence and design and see how the questionnaire performs under actual conditions (Churchill and Iacobucci, 2002).

Piloting will enhance the instrument's validity and reliability as well as ensure familiarity with the administrative procedures in data collection. The results will help the researcher to correct inconsistencies arising from the instruments, which will ensure that they measure what it ought to measure.

3.6.1 Reliability

Reliability and validity are means of evaluation of research instruments. Reliability, according to Eriksson and Kovalainen (2008), is the extent to which a measure, procedure or instrument yields the same result on repeated trials. Mugenda and Mugenda (2003) define reliability as a measure of the degree to which a research instrument yields consistent results or data after repeated trials. In order to test reliability in research, three methods are widely used which are the 'test re-test' method, the 'split-halves' method and the 'internal-consistency' method.

The study will use 'split-halves' and 'internal consistency' method to measure reliability. 'Split-halves' method will be used by comparing the two halves of the responses to each other and similarities identified. The more similarities between the two halves and each question can be found the greater the reliability. According to Zikmund (2003), the 'split-halves' method is the most suitable and basic method for checking reliability when the study have a large amount of raw data.

Internal consistency method will be tested using Cronbach's Alpha. Cronbach's alpha is a measure of internal consistency, that is, how closely related a set of items are as a group. A "high" value of alpha is often used as evidence that the items measure an underlying (or latent) construct (Warmbrod, 2001). Reliability with a predetermined threshold of 0.7 is considered

acceptable. That is, values above 0.7 will indicate presence of reliability while values below will signify lack of reliability of the research instrument.

3.6.2 Validity

According to Borg and Gall (1989) validity is the degree by which the sample of test items represents the content the test is designed to measure. Content validity which will be employed by this study is a measure of the degree to which data collected using a particular instrument represents a specific domain or content of a particular concept. Mugenda and Mugenda (2003) contend that the usual procedure in assessing the content validity of a measure is to use a professional or expert in a particular field.

To establish the validity of the research instrument the researcher will seek opinions of scholars and experts in ERP including the supervisor and lecturers. This will allow modification of the instrument thereby enhancing validity. Furthermore, the study will assess the responses and non-responses per question to determine if there is any technical dexterity with the questions asked.

3.7 Data Analysis

After data collection, the filled-in and returned questionnaires will be edited for completeness, coded and entries made into Statistical package for social sciences (SPSS version 19). Coding is technical process where raw data are transformed into easily tabulated form by way of assigning symbols. This helps in condensing the responses into few categories for the purposes of data analysis. The dataset will then be subjected to a verification process to verify if the captured data correlated with the data-capture into SPSS.

Both descriptive and inferential statistics will be used to analyze the data. Descriptive analysis will be conducted on primary data. Mean and standard deviations will also be used as

measures of central tendencies and dispersion respectively. Correlation will be used to analyze the degree of relationship between the variables in the study. Further, regression will be used to obtain an equation which describes the dependent variable in terms of the independent variable based on the regression model. Data will be presented in the form of frequency distribution tables, graphs and pie charts that will facilitate description and explanation of the study findings.

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APPENDIX 1: QUESTIONNAIRE

SECTION A: GENERAL INFORMATION

1. Name of the Department.....

2. Position of the person filling the questionnaire.....

3. Please indicate your highest level of formal education

Certificate Diploma University first degree Post graduate

4. What is your gender?

Female Male

5. Please indicate your age bracket

Below 25 yrs 26-30yrs 31-40 yr Above 40 yrs

6. For how long have you worked in the department named above?

Less than 5 years 5-10 years above 10 years

SECTION B: EFFECT OF ERP ON ORGANISATIONAL PERFORMANCE

7a) . Your organization has a Headquarters (HQ) somewhere else that coordinates your activities: () Yes () No

b) Which ERP (enterprise resource planning) system do you have?:_____

examples: SAP, Oracle, JD Edwards, Navision, Scala, Baan, Nova, Movex, i2, Proteus, etc.

c) When (year) did your organization COMPLETE the implementation of the ERP system:_____

8. To what extent do you agree or disagree with the statements provided below. 1-strongly disagree, 2- disagree, 3- neutral, 4- agree and 5- strongly agree

	1	2	3	4	5
In our organization, decision making is kept ONLY at the top					
In our organization, rules and procedure are clearly documented and are known					

to all employees					
In our organization, organizational tasks are divided into separate jobs.					

9. How valuable is the information technology (IT) department in your organization?:

- Not valued, at all
- Moderately valued
- Valued
- Highly valued

10. To what extent do you agree or disagree with the statements provided below. (1-strongly disagree, 2- disagree, 3- neutral, 4- agree and 5- strongly agree)

Statement	1	2	3	4	5
Our ERP system supports our business goals					
The management of our firm freely share information					
The different departments are of equal importance to top management					
Top management supports the adoption and use of our ERP system					
Employees are happy with the changes that management decides on ERP issues					

11. To what extent do you agree or disagree with the statements provided below. (1-strongly disagree, 2- disagree, 3- neutral, 4- agree and 5- strongly agree)

Statement	1	2	3	4	5
Our ERP has accurate data					
Our ERP is flexible					
Our ERP is easy to use					
Our ERP is easy to learn					
Our ERP is reliable					
Our ERP allows data integration					
Our ERP is efficient					
Our ERP allows for customization					
Our ERP has good features					
Our ERP allows for integration with other IT systems					
Our ERP meets users' requirements					

Our ERP improves individual productivity					
Our ERP is beneficial for individual's tasks					
Our ERP reduces organizational costs					
Our ERP improves overall productivity					

SECTION C: ORGANISATIONAL PERFORMANCE

12. The statements below are concerned with firm performance. Please tick the one that best describes your opinion. Use the following scale. **1- strongly disagree, 2- disagree, 3- neutral, 4- agree and 5- strongly agree**

Statement	1	2	3	4	5
Our firm has stronger growth in sales revenue.					
Our firm is better able to acquire new customers.					
Our firm has a greater market share.					
Our firm is able to increase sales to existing customers					
ERP facilitates profit maximisation and eventually leads to improved business performance					
ERP improves competitive advantage and lowers transaction costs					

APPENDIX 2: WORK PLAN

ACTIVITY	PERIOD
	YEAR 2014
Writing research proposal	Jan
Proposal correction and piloting	February
Data collection	March
Data analysis	April
Research report writing	May
Submission of 1 st draft to supervisors	June
Submission of thesis for Examination	July

APPENDIX 3 - BUDGET PLAN

This refers to the list of items that will be required to carry out research and the approximate cost.

MATERIALS/SERVICES	AMOUNT (KSHS)
Literature review and collection of secondary data	5,000
Typesetting (proposal)	4,000
Copying and binding proposal	3,000
Typing and copying research instruments	5,000
Data collection – transport and subsistence	22,000
Data analysis	8,000
Typing, editing and copies of research report for examination	5,000
Defense of thesis	2,000
Collection of final thesis, making copies and submission	6,000
Miscellaneous expenses	3,000
TOTAL	50,000