

**THE EFFECT OF CUSTOMIZATION ON THE AUDIT RISK
OF ACCOUNTING INFORMATION SYSTEMS FOR
NAVISION ERP SYSTEMS IN KENYA – NAIROBI COUNTY**

BY

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DECLARATION

Student Declaration

This is my original work and has not been presented in any other university or college for examination purpose.

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Supervisor's Declaration

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

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Above all, thanks to my God because of the unwavering provision, love and protection in all moment of lack and despair, fear and discouragement. Individually I take responsibility of the formatting errors that will be spotted in these script. My special gratitude goes to my supervisor Dr. Aduda who tirelessly through his effort, experience, expertise and initiative guided me through the whole process. I would like to acknowledge all the MSC students, colleagues, friends and my family especially for their material support to the completion of this project.

DEDICATION

I dedicate my dissertation work to my family and many friends. A special feeling of gratitude to my loving parents, John Rao and Zilper Rao whose words of encouragement and push for tenacity ring in my ears.

I dedicate this work and give special thanks to my best friends Clara Mwanje and Paul Omulokholi for their constant support during my study period.

Both of you have been my best cheerleaders.

ABSTRACT

An Accounting Information Systems (AIS) is considered as a collection of data and processing procedures that creates the needed information for its users. These systems range from simple non-computerized systems to complicated Enterprise Resource Planning (ERP) systems. This study therefore sought to establish the effect of customizations on the audit risk of Accounting Information Systems, a case study of the Navision ERP systems installed in Nairobi County in Kenya. The study adopted a quantitative and descriptive design. The research entailed a case study of companies that have implemented Navision ERP system. Stratified sampling was employed in selecting ten companies to be audited across three company categories. The study collected primary data by use of questionnaires. The study concluded that Navision ERP best fits the nature of financial, manufacturing and distribution businesses. The study concluded the higher the customizations within an ERP system the higher the audit risk. The finding also concluded that these companies had customized the ERP system since its installation to align the ERP to the business processes. The study also concluded that customizations were usually authorized before they began. Furthermore, the study also concluded that there are clear laid out processes in the company for carrying out system customizations. The study recommended that companies seek to reengineer their business processes so as to keep customization to the acceptable level and hence minimize audit risk. The study also recommended that the organizations ensure that they authorize all the customizations a member of the audit team be involved in the customization process. Key to minimizing audit risk was ensuring adequate documentation for the customizations done.

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LIST OF ABBREVIATIONS

BPR – Business Process Reengineering

EIS – Enterprise Information System

ERM – Enterprise Risk Management

ERP – Enterprise Resource Planning

SOX – Sarbanes-Oxley Legislation

SPSS – Statistical Product and Service Solutions

CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

An Accounting Information Systems (AIS) is considered as a collection of data and processing procedures that creates the needed information for its users (Bagranoff, 2008). These systems range from simple non-computerized systems to complicated Enterprise Resource Planning (ERP) systems. ERPs unify, store, integrate and disseminate all accounting and financial information flowing through an organization (Haddara, 2012). ERPs were introduced to mitigate loss through the extensive built in controls established within the systems as required by the Sarbanes-Oxley (SOX) legislation (Morris, 2011).

ERP systems out-of-the-box rarely match the business process and hence organizations are faced with the option of business process reengineering to adapt to the ERP processes or customizing the ERP to adapt to business processes or both (Price & CISA, 2009). When the ERP customization option is chosen the ERP system capabilities are aligned to the processes in an organization (Huang, Chen, Chiu, & Hsieh, 2012). While customization efforts are supposed to mitigate risk through increased controls this renders ERP systems more complex resulting in a challenge to auditors when conducting audits (Hunton, Wright, & Wright, 2004). According to Hunton et al., (2004) auditors lack the necessary aptitude to recognize heightened risks that may be present in ERP environments.

1.1.1 Customization of ERP system

ERP implementation projects entail installation, parameterization, and integration, testing and stabilizing the new system and hence tend to be more complex than typical software development projects and consequently have a higher risk of failure (Eymann, 2011). In terms of the data held by Accounting Information Systems, ERPs being a key contributor in this category, it shows that while 80% of the total circulating information in an organization relates to economic data, about 45-50% of this are information provided by Accounting Information Systems (Arsenie-Samoil, 2011). ERP systems are further customized to align ERP system capabilities with the processes in an organization (Huang, Chen, Chiu, & Hsieh, 2012). This makes ERP systems way more complex.

Proper documentation of ERP customizations is key in minimizing the audit risk. ERP projects are large projects and as such are worked on by large project teams hence a need for proper coordination through elaborate communication of the tasks being carried out by different team members. According to Tang, Liang, & Vliet (2011), comprehensive software documentation ought to be done to ensure timely sharing of software knowledge. The method of documentation should utilize mediums that are easily retrievable through indexing and sharable even during editing. Tang, Liang, & Vliet (2011) state that such medium should allow for update and release of such files in portions and allow for easy searching and location of components. Price & CISA, (2009) states that the documentation also needs to be kept up to date since the documentation of a system undergoing rapid changes is bound to get outdated quickly. Furthermore the documentation ought to be detailed, complete and accurate. This is done through reviews of the

documentation to ensure they have adequate breadth and depth. Depth connotes the level of detail that is enough for the system to be evaluated or duplicated by those unfamiliar with the system. Breadth on the other hand means it should be clear within the documentation to what extent is a related control aspect of the system implemented.

The internal audit team plays a critical role in controlling the customization process of ERPs. For the principles of customization to be effected, a thorough analysis of customizations and documentation should be done before any customization is made so that only that which needs to be amended is fixed. For this to occur involvement of the internal audit team who are central to the successful implementation of ERPs is essential (Madani, 2009). Core strategic tasks for the internal audit team include: ensuring executive support and creating consciousness for program risk management, taking a holistic approach in identification of programs at risk, creating an active and ongoing risk management program with regular audits, building a program audit team with the appropriate skills and desirable experience and finally including program issues in a consolidated risk analysis (Madani, 2009). Involvement of the audit team emerges as core, in reduction of risks associated with customization.

Where ERP system customization is carried out, an effective change management process needs to be maintained (Price & CISA, 2009). This is key as poorly controlled changes introduce flaws in the system that may compromise the system or allow a known weakness to persist. Such changes range from periodic vendor updates to custom modules deployed to adapt to organizational processes. Only authorized changes that are agreed upon and permitted by management should be carried out. The process of making such changes should ensure

separation of duties during the process and ensure the process is documented and followed. Validation of changes should be done by parties separate from those charged with implementing the change so as to provide a guarantee that only targeted aspects of the change were made.

Risks brought about by customization should be minimized by re-using various components as much as possible. The implementation approach for customized systems states out key principles that should guide the implementation framework for such systems (Zhao & Fan, 2007). The principle of similarity entails identifying and making use of common features and components among processes so as to achieve a level of standardization and increase re-usability of components. This points out to the frequency of customization and hence seeks to standardize customizations by building onto the principle of reuse and combination so as to transform the problem of customization to take advantage of the benefits of mass production namely low cost, high quality and high efficiency. Finally the principle of globalization is addressed so as to integrate all forms of knowledge and domains and analyze and tackle customization problems in a complete way.

Critical to ERP implementation is the matching of the chosen ERP functionalities and the organizations initial needs. This is pegged on selecting an ERP solution that comes closest to the nature of your operations or is in the organizations domain (Riadi, 2012). According to Riadi (2012) a matching approach for ERP selection should be based on domain reuse by pooling ERP business requirements of organizations in the same field. Much as the matching approach may be adopted enterprises hardly come across ERP systems that match all their operations or processes. Available options are for the organization to adjust its current processes to match up to that of

the ERP framework or keep them and customize the ERP to suit the business processes (Huang et al., 2012). Somers & Nelson (2003) states that at least 20% of ERP customers find that functionality they need from the package is missing at various levels hence the need for customizations to fit the system to organizational structure and process.

1.1.2 Audit Risk of Accounting Information Systems

Audit risk is a composition of inherent risk, control risk and detection risk (Rao & MacDonald, 2011). According to Rao & MacDonald (2011) the legal fees charged by auditors should be based on the riskiness of the audit client since there are legal and financial consequences if the firm fails financially. Various accounting crises have been witnessed in the past and have tainted the audit profession. Such crises include those of Enron, Parmalat, WorldCom, Xerox, Ahold Royal, and Equitable Life Bankruptcy (Gherai&Balaciu, 2011). Valipour, Moradi, & Moazaminezhad (2012) states that inherent and control risk emerge from the firm, while the detection risk is attributed to the auditors. Inherent risk is the susceptibility of account balances to error that could be material assuming that there are no controls in place. On the other hand control risk is the risk that internal controls will not prevent or detect a material misstatement (Miller, Cipriano, & Ramsay, 2012).

According to Haddara (2012) ERP implementations are considered to be the most complex and largest projects an organization could undertake. Due to the consolidation of such enormous financial data, compromising of ERP system does pose huge risk to an organization. Such a compromise may cause theft of confidential data, financial fraud and corrupted operation data (Chang & Jan, 2010a). One needs to understand the related risks and controls when undertaking

ERP projects. Much as ERP's seem to be increasingly adopted their failure rate range between 40 to 60 percent (Liang, Saraf, Hu, & Xue, 2007a). This vast failure rate is attributed to the complexity of ERP systems.

1.1.3 Customization and Audit Risk of Accounting Information Systems

Much as customization is aimed at conforming the ERP system to the business process it ends up in compromising best practices observed in the design of software through these customizable configurations (Liang et al., 2007a). Arif et al., (2010) states the recommended maximum allowable customization is 30%. Liang et al (2007) states that the outcome of an ERP project is highly dynamic and often a moving target hence an early success could turn into a later failure while a later failure may turn into an early success. Every aspect of customization introduced into an ERP system increases the overall complexity which results in the potential for weakness to be introduced into the system (Price & CISA, 2009). Such complexity contribute to the inherent and control risks that auditors analyze as regards ERP systems.

It can thus be taken that the degree of customization of a system is proportionate to the risk attributed to the audit risk component that would be attributed to customization. Advances in IT have led to changes in auditing procedures especially with the introduction of Enterprise Information Systems (EIS), e-marketplace technology, ERPs and business intelligence (Tsai et al., 2013). As ERP systems get more complex a challenge is posed to auditors with an indication that auditors' lack of the necessary aptitude to recognize heightened inherent and control risks in ERP environments (Hunton, Wright, & Wright, 2004).

1.1.4 Navision ERP system in Kenya

ERP Systems have been gaining acceptance with the need for an all-inclusive information system that captures processes across various departments of a company (Chang & Jan, 2010). Their use has greatly increased over the years. In Kenya Navision ERP is predominantly employed in small and medium sized enterprises. A survey of 500 mid to large sized companies showed that 67% of the companies had adopted ERP's while 21% were considering adopting the same (Liang et al., 2007a). The rampant ERP adoption is considered a step towards process standardization, cost effectiveness and a way to survive the harsh competition from the market.

1.2 Research problem

This study ought to explore considerations made by various companies on the decision to customize their ERP process during ERP implementation. Further the aspects that lead to heightened ERP risks with introduction of customizations will be investigated in consideration to their impact on the audit risk. The highlighted factors include the level of fit of the chosen ERP, the frequency of components re-use, the level of documentation, the audit team involvement and the change management process. Key to note from this study will be how the audit risk attributed to customizations can be reduced in ERP environments.

Owing to the complexity introduced by customization of ERPs, it's expected that the audit risk of ERP systems would increase with increased customization. Hunton, Wright & Wright (2004)

show that ERP environments are a challenging environment for auditors. Auditors who lack the necessary IT skills to audit such systems should rely on information system auditors to carry out successful audits as has been shown by Hunton et al., (2001). This research seeks to explore the audit risk aspects that can be attributed to customization of ERP systems.

Chang & Jan (2010b) state that putting in place ERP systems ought to reduce the audit risk, due to the controls factored within the system. The controls are supposed to adapt the system to business processes within the organization and in the process, factor in various measures to mitigate risk. Such controls ought to reduce the control risk component though it can be argued that customizations at times override the initial controls put in place making the system more risky (Liang et al., 2007).

Auditors are expected to analyze the audit environment and give a measure of the control and inherent risk. An auditor can only objectively evaluate inherent risk of an ERP system if they have an in depth understanding of such system (J. Hunton et al., 2001). Such an assessment should entail an analysis of the processes that have been customized within the system. This should guide on the level of ERP audit expertise that would be required to advance the audit risk levels that are acceptable.

1.3 Objectives of the Study

The objective of this study is to establish the effect of customizations on the audit risk of Accounting Information Systems, a case study of the Navision ERP systems installed in Nairobi

County in Kenya.

1.4 Value of the Study

This research shall be of benefit to those involved in conducting of financial statement audits, those who utilize the audit report as well as ERP implementation experts involved in selection and implementation of ERPs. These teams consist of the external auditorsofa company, the board and management of a company as represented by the internal audit team that works in conjunction with the Boards audit committee. Finally, ERP implementation experts who advice companies on the appropriate choice of ERP systems and on the decision of whether to customize or reengineer ERP processes shall use the findings of the research.

Audit firms take liability both legally and financially if firms they have been auditing fail financially (Rao & MacDonald, 2011). Auditors ought to conduct a thorough due diligence to establish the audit risk of the environment they will be auditing. ERP environments pose a unique risk due to the complexity of such systems. Proper analysis of ERPsystems will guide audit firms in putting together an audit team equipped with the appropriate level of skills necessary to carry out audits in such challenging environments. This research will help audit firms better access the inherent and control risk so as to come up with an appropriate level of detection risk.

The management and board of a company rely on the internal audit team that works in conjunction with the audit committee to report on the financial health of the organization. Just like the external auditors the internal auditors require the appropriate skillset to effectively audit such environments. This research ought to be an appropriate guide in designing the control

processes in light of a company's Enterprise Risk Management System. Further, being aware of the potential risks, the audit team will know the appropriate level of involvement in ERP design and implementation.

ERP implementation experts guide companies on the choice of ERPs and the appropriate implementation method. The experts will better be equipped to guide companies on an appropriate ERP choice that best suits an organization's processes with the awareness of the complexity brought about by customization. In addition, they will be made aware of appropriate measures that need to be taken if customizations have to be done. They will also be better equipped to advise on the capability of auditors in performing audits in ERP environments.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter will seek to review key audit and information system theories that govern this research. In addition, various related studies will be reviewed, to provide a basis for this research as well as establish the research gap. The conceptual framework will be established that will seek to map out all the concepts, their variables and interrelationships.

2.2 Review of Theories

The theories guiding this study include: the audit risk model, the agency theory and the contingency theory.

2.2.1 Audit Risk Model

According to Valipour, Moradi, & Moazaminezhad (2012) the Audit Risk Model was developed to evaluate the audit risk and give a reasonable level of assurance of the audit process and is defined as:

$$\text{Audit risk} = \text{Detection risk} * \text{Inherent risk} * \text{Control risk}$$

According to Valipour, Moradi, & Moazaminezhad (2012), inherent and control risk emerge from the firm, while the detection risk is attributed to the auditors. Detection risk is the acceptable level of risk that the auditing procedures will not detect material misstatement (Houston, Peters, & Pratt, 1999). Rao & MacDonald (2011) state that inherent risk is client specific and is the risk involved due to the nature of a business and its transactions, and hence the more complex transactions or processes are, the higher the inherent risk (Hematfar & Hemmati, 2013a).

Customizations render ERP systems more complex thus leads to increased inherent risk. The control risk seeks to evaluate the controls put in place to mitigate loss that could arise due to the highlighted inherent risks (Miller et al., 2012). For a customized ERP system with inadequate customization controls, the detection risk is supposed to be at a minimum implying that the auditor should be very competent in auditing ERP systems.

2.2.2 Agency Theory

According to Mitnick (2011), agency theory attempts to describe a relationship where one party hereby the principal delegates work to another party i.e. the agent. This theory emphasizes that the agent should always work in the best interest of the principal by only incurring costs that will increase shareholder value. This ought to be done by selecting a compensation system that will produce agent behavior that's consistent with the principal (Mitnick, 2011). Agency costs ought to be constantly analyzed so as to determine how well managers are fulfilling their responsibility to the owners. Ittonen (2010) suggests that auditing is a monitoring system employed by the owners of an organization and that the need for auditing is seen more with increased number of employees or complexity of the organizational structure.

ERP system are prone to fraud and hence call for auditors to oversee segregation of assets custody from accounting, segregation of the transactions authorization from custody of the assets, segregation of operational responsibility, record-keeping responsibility and finally segregation of the duties of the Information Technology experts who are allowed to perform

program modifications from those of key users outside IT who are allowed to perform authorization, entry, correction and review of outputs(Madani, 2009). ERP systems being the nerve center for all business accounting processes can be manipulated in an inappropriate manner during customization so as to fraudulently benefit parties other than the principal.

2.2.3 Contingency Theory

The contingency theory suggest that an accounting information system should be designed in a flexible manner (Gordon, 1992). These systems ought to give consideration to the environment and the organizational structure of varied organizations. These systems need to be designed with an adaptive framework so as to adapt to specific decision made within an organization. The key driver for the contingency theory was that as management perceive greater environmental uncertainty they tend to seek and incorporate more external and non-financial information. According to Price & CISA (2009) ERP systems out-of-the-box rarely match the business process and hence organizations are faced with the option of business process reengineering, customizing the ERP or both. The customization option is often preferred since it avoids the challenges of change management.

2.3 Determinants of Audit Risk of Accounting Information Systems

Audit risk of Accounting Information Systems relates to two broad aspects categorized as external and internal. The external aspects refer to the environment on which the System is

stored and run, is considered as a source of risk. Procedures need to be put in place for access and possibility of recovery of data in the event of physical damage. The internal aspects relate to aspects that ensure the integrity of data including appropriate permissions for various levels of access and in addition the accurate processing of the data which is pegged on the correctness of the system processes. ERP out of the box have standard processes which can be customized to suit organizational requirements. The aspects that lead to heightened ERP risks with introduction of customizations include the level of fit of the chosen ERP, the frequency of components re-use, the level of documentation, the audit team involvement and the change management process.

2.4 Review of Empirical Studies

Liang, Saraf, Hu, & Xue (2007b) conducted a research that evaluated the organizational impact of ERP systems after the system has been implemented and is in use. The study states the extent to which the organization will experience benefits will be tied to the level of interdependence and differentiation among various units of an organization. The study highlights that performance is affected by the level of fit between information processing mechanisms and the organizational context. The information processing mechanisms refer to the features and capabilities of the ERP system, while the organizational context refer to the processes of an organization. The study highlights that the ERP will be a better fit if the differentiation between various units is low. Since customization seeks to increase the fit of an ERP system, this study assumes an organization will avoid customization. This assumes that standard processes and data definitions are defined to meet the needs of the overall company. This research differs from Liang, Saraf,

Hu, &Xue (2007b) study since, organizations will be assumed to customize ERP systems so as to achieve a suitable level of fit.

According to Akkermans & van Helden (2002) the level of fit of ERP systems in organizations is a key factor in ERP success. Fit of an ERP systems depends on whether the system is suited for large or small organizations. Some systems may be suited for particular industries while some suited for certain parts of the world. In addition to the selection of a particular criteria a particular version and a number of selected modules must be selected that are representative of the organizations operations. If a choice leads to a misfit between a package and business processes (Somers & Nelson, 2003), there would be a need for major modifications of the system that are costly and risky. According to Sumner (2000), some organizations that realize the lack of fit end up reengineering their business process which results in risk to the ERP system implementation. This research agrees with Liang, Saraf, Hu, &Xue (2007b) study since, organization will be assumed to customize ERP systems so as to achieve a suitable level of fit.

A key driver for implementation of ERP Systems is their use to facilitate regulatory compliance through incorporation of various controls (Mundy & Owen, 2013). The study focusses on the role, use and purpose of the ERP system by addressing concerns about ERPs' capacity to meet the requirements of legislative compliance. The study highlights that firms have the choice of using their ERPs to manage regulatory compliance and governance concerns as compared to using ERPs to implement internal controls over financial reporting. The study highlights that often firms fail to customize their ERPs to specific business requirements and instead

implementing them in a standardized way in accordance to best practice that has been provided by vendors.

The extent of involvement of Information Systems auditors to complement the services of financial statement auditors is core to evaluation of the risk of material misstatement (Selby, 2011). According to Selby (2011) overdependence on IT auditors raises the cost of performing audits thereby decreasing the profitability of the exercise. This was done by investigating whether financial statement auditors can interpret risk patterns in automated-control evidence. The findings indicate that only the financial statement auditors with procedural knowledge of automated controls interpret the risk patterns in automated-control evidence. Selby recommends that firms should allow their financial statement auditors to gain procedural knowledge of automated-control evidence, so as to progressively cab this limitation that could lead to increased cost of performing audit.

According to Shin, Lee, & Park (2013) the continuous approach to auditing ought to be adopted in the auditing of ERP systems. This study was done with an aim of assisting many companies to tackle corruption or circumventing of internal controls. Shin, Lee, & Park (2013) proposed a shift from historical reviews of legal and regulatory violations to proactive risk management that promotes efficiency within a business. This is mainly applicable to the internal audit team. Other changes proposed by this method of auditing include moving from auditing based on information collected by individuals to one that utilizes systems. This will call for adopting a risk-based approach to auditing. Risk-based auditing entails identification and reporting the risk of significant distortions that may be present in financial statements (Hematfar&Hemmati, 2013).

The auditor first examines the accounting and internal controls put in place, then does an estimate of the inherent and control risks which are used to determine the reliability of the internal controls. If internal control system is found effective a test of controls is performed by the auditor. Shin, Lee, & Park (2013) propose use of inbuilt features within ERPs to continuously gather data from processes, transactions and accounts data which eventually support the internal and external auditing activities.

According to Arif et al., (2010) from a review of many studies advocate for minimum customization levels as the higher the customization the lower the implementation success of ERPs. In their paper, Arif et al. (2010) proposes a measurement framework that investigates the relationship between the level of ERP success and the extent of customization. A measurement was to be used to measure the extent of allowed customization as established by Ehsary, Dijkman, &Kusters (2010). The paper establishes a measure of the degree of customization based on the ERP objects that have been modified and the time over which they have been developed. Modified objects were grouped into various categories, while time duration taken put into categories as an indicator of the level of complexity of that customization. The ERP objects examined included reports, interfaces, extensions, conversions and workflows.

Mutongwa&Rabah (2013) conducted a study on ERP Solution for Small and Medium Enterprises (SMEs) with particular focus of Trans Nzoia County in Kenya. The study highlights the criticality of security for ERP systems. This is aggravated by the fact that auditing of ICT infrastructure has proved to be a challenge. To cub this security risk there is hence the need to develop a security policy that is a specialized model for ERP systems. The study suggests that to

provide security, a firewall server should be placed between the user and the ERP system. The study highlights that SMEs focus on the security of database systems.

Otieno&Oima (2013) carried out a study of the effect of computerized Accounting Systems on the Audit Risk Management with a focus on Public Enterprises focusing on Kisumu County. The study highlighted the proliferation of computerized accounting throughout the entire financial service industry. The study indicates that the key areas of risk posed by such information systems entail the risk of breaches in the security system and risk of the system providing inadequate information. The study focusses on risks that are tied to the security of the systems and their control of access. This doesn't factor in those with legitimate rights to use the system but may perform unacceptable operations that may compromise on the integrity of data. This calls for auditors to review their ERP procedures so as to mitigate such risks.

Muthamia (2009) undertook a study on critical success factors for implementing the SAP ERP in Kenya. A key focus of the study was the role of Business Process Reengineering in successful ERP implementation. This study addresses ERP fit in implementation setups. The study highlights that companies should strive to maintain existing ERP functionality and to change their procedures to adapt to it. This study advocates for minimal if no customization of the system. This is referred to as Technology-Enabled Reengineering or constrained reengineering. This calls for Business Process Reengineering (BPR) within the organization. BPR however is quite challenging to undertake within an organizational context due to challenges that include employee resistance to change, inadequate attention to employee concerns, inadequate staffing and failure of leadership commitment. The study also highlights that choosing of ERPs should be

done carefully so as to ensure the package best matches the legacy systems including the hardware platform, databases and operating systems in place. This study however shows why most organizations find it easier to customize their ERP so as to achieve the desired level of ERP fit.

According to Mboni (2012) audit trails are key in mitigating the risk that is inherent to user actions when using information systems. This study refers to the audit trail as the source of documentation of detailed transactions which support all the ledger entries carried out. The study highlights that with computerization of various processes, the business paper trail that made up the traditional audit trail has become extinct and the volume of information available has tremendously increased. The study highlights various auditing technology. A key technology is the use of snapshots whereby an image of the Information System data is taken at various regular intervals. This should then be used as a review for changes to application controls or object changes. According to the study, technology include network and database logs. Network logs keep details of activity that flow across the network while database logs are useful for rollback of transactions and mirroring of instances. Such documentation is key to act as a control of changes or customizations that are done on systems and the approvals of the various authorizations that ought to have taken place are carried out.

2.5 Summary of Literature Review

Previous studies have mainly highlighted approaches for minimizing risk which include continuous auditing and risk based approach in doing the same, minimization of customizations, more of business process re-engineering as opposed to customization and having elaborate audit

trials. A key risk that is highlighted when dealing with ERPs is the breach of security of the system. Other studies have also highlighted on the key drivers for implementing ERPs which include regulatory compliance. The level of fit of an ERP is also considered to greatly contribute to the organization's success.

From the literature various risks that arise from customization have been highlighted. It is however not clear how the different components of risk contribute to the overall audit risk component. This study therefore adds to existing knowledge by providing a model for evaluation of audit risk based on the customization of ERP systems. From the previous studies no model indicating the relationship between the level of fit of the chosen ERP, the frequency of components re-use, the level of documentation, the audit team involvement and the change management process does exist.

CHAPTER THREE: RESEARCH METHODOLOGY

This chapter sets out the mechanisms outlined for conducting the research, the kind of data needed and the details of how this is to be achieved in practice.

3.1 Introduction

In the previous chapter, a literature review was done to explore the factors that affect the audit risk component that would be attributed to the customization of ERPs. The factors that were identified during the investigation include: the quality of documentation, involvement of the audit team, the level of fit of the selected ERP and the change management process and the frequency of components re-use. Having laid out this basis the research methodology used to carry out this study was highlighted in this chapter.

Research entails formulating the problem being investigated, selection of an appropriate research design, and selection of appropriate methods for data collection, analyzing and reporting the findings of the process through a report. The research methodology refers to the research decisions taken within the framework of specific determinants unique to the research study. This study being a case study, focused on the Navision ERP system which is a product by Microsoft Inc. The unit of analysis was the manufacturing companies whereby Navision ERP system has been deployed by Microsoft partners as well as companies with in-house Navision ERP developers. As has been highlighted in the previous chapters, the aim of this research is to

evaluate the aspects of customization that would affect the audit risk of ERP systems. After discussion of the research design, methods of data collection, sampling and data analysis was discussed.

3.2 Research Design

The research design is of crucial importance since it determines the success or failure of research. The research design gives a logical arrangement for the collection and analysis of data so that conclusions may be drawn. A research design is a blueprint or detailed plan of how a research study is to be conducted – operationalizing variables so they can be measured, selecting a sample of interest to study, collecting data to be used as a basis for testing hypotheses and analyzing the results.

The research took on mainly of a quantitative and descriptive design. Being quantitative the study entailed collecting data through questionnaires that were used to measure various aspects. In order for the study to bring out an in-depth analysis of companies that have implemented ERPs, are involved in varied lengths of customizations and their motivations for the same a descriptive study was adopted. Furthermore, as pertains the time horizons, a cross-sectional study of the selected companies will be done. A cross-sectional study helped establish the prevalence of customization among companies that have implemented ERP systems over varied period of times hence give variation to the extent of customization.

3.3 Population

This research entailed a case study of companies that have implemented Navision ERP. Navision ERP system is implemented in about four hundred companies in Kenya as confidentially

revealed by the Microsoft office in Kenya. This research was limited to various sectors including companies that offer financial services, those involved in manufacturing, and those involved in distribution and retailing. An individual company was the unit of analysis of this research. A case study approach of the Navision ERP system has been selected since much guidance was required in accessing the degree of customization. Measuring the customization level varies between various ERP systems and as a result the Microsoft Navision ERP system was chosen in consideration of the researcher's familiarity and the prevalence of this ERP in the Kenyan market amidst small and medium sized enterprises compared to other ERP solutions. As such there is need to narrow down on a particular ERP system for which the researcher has the desired expertise to make measurements with accuracy.

The respondents of the questionnaire will include the internal audit team representative, and the IT personnel in charge of the ERP solution in the same company.

3.4 Sampling

A non-probabilistic sampling technique was selected due to the difficulty of data access. Stratified sampling was employed in selecting ten companies to be audited across three company categories. The categories include companies in the manufacturing sector, financial sector and distribution. The research was a cross-sectional study carried out within a span of one month. Data was collected from ten companies per sector through convenience sampling of the available target population. Convenience sampling was done due to the rigor of data collection that this

research will entail and the sensitivity of such information which not every client may be willing to offer.

3.5 Data Collection

Primary data was collected to measure the extent of documentation, audit team involvement, change management process commitment and the level of fit of the ERP. This was done using questionnaires. The extent of documentation entailed determining the breadth, depth, completeness and ease of accessibility of available documentation. The audit team involvement will be evaluated based on their contribution in analyzing risks that could arise from proposed system ERP customizations. The change management process was assessed by evaluating the authorization of various changes, the consideration for putting in place controls that ensure segregation of duties, follow up on the changes made to ensure that only the authorized changes were made and training of the users on changes made. Companies ERP systems were examined for the extent of customization of the system, by examining the number of customized components or objects and the time taken to develop them. This would serve as the inputs from the framework for ERP customization measurement developed by Arif et al., (2010) from which the complexity index for each customized object is selected.

3.6 Ethical Considerations

An assurance of confidentiality is key when collecting audit related data. Most audit companies are in non-disclosure agreements with their clients. A high level of assurance of confidentiality shall be required for the audit firms to be a part of the research. So as to show the legitimacy of

this research a permit will be obtained from the Ministry of Education through a referral letter from the University administration. The consent of the respective companies will be sought before getting their auditors to provide the required data. This shall be presented to the companies in form of an assurance from the audit firms of the usefulness of the research and how beneficial it may be in analyzing their ERP risk in subsequent audits. Data collected will be kept anonymous at the following levels: audit firm to audit firm and at a company level. Questionnaires awarded will be coded so as to have different codes for different companies. Confidentiality of the respondents will be ensured by not indicating the respondent names on the questionnaires. The respondents will be made well aware of the essence of the research so that total informed consent is achieved for the interview. The respondent's participation will be solicited through informed consent.

3.7 Data Analysis

Analysis of this study was done based on the model below:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon_1$$

The symbols represent the following variables:

Y – Level of documentation of customizations of the ERP

X_1 – Level of documentation of customizations of the ERP

X_2 – Level of involvement of the audit team in customization of the ERP

X_3 – Extent of reuse of developed components in customization

X_4 – Level of adherence to the change management processing during customizomization

X_5 – Level of fit of the ERP to the business process before introduction of customization

β_0 – Constant of the Regression

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ – Coefficeint of the corresponding variables

ε_1 – Error term

Y = Audit risk which according to Arif et al., (2010) the risk of an ERP system is proportionate to the level of complexity of the ERP system and would hence be used to measure the level of audit risk. This is measured by the ERP objects that have been modified and the time over which they have been developed. This complexity was interpreted according to the complexity matrix below from which the audit risk will be the summation of the complexity of the individual components as indicated below.

Customization Types	Complexity			
	Simple	Medium	Complex	Very Complex
Reports	0<dt≤56 i=31	56<dt≤84 i=66	0<dt≤157 i=121	157<dt i=292
Interfaces	0<dt≤44 i=33	44<dt≤166 i=65	166<dt i=213	
Extensions	0<dt≤44 i=21	44<dt≤103 i=65	103<dt≤227 i=179	227<dt i=281
Conversions	0<dt≤90 i=56	90<dt≤212 i=124	212<dt i=300	
Workflows	0<dt≤57 i=56	57<dt≤71 i=64	71<dt i=77	

Where:

dt - the development time and

i – Complexity Index

To analyze the effect of customization on the audit risk, descriptive statistics will be used to do a preliminary analysis entailing mean, median and standard deviation. This will be established for the level of fit of the ERP system, the frequency of components re-use, level of documentation,

audit team involvement, change management and the degree of customization. The model will be analyzed for goodness of fit using the coefficient of determination R^2 . The degree of customization established will be taken to be proportionate to the audit risk attributed to customization. Hence R^2 will give the percentage of the variance of audit risk attributed to customization explained by the model, while the difference will be attributed to the error term. Each of the variables that operationalize the audit risk due to customization will be evaluated for its significance in the model. A p-value of 0.05 or lower will be the desired for a 95% chance that the independent variables contribution is significant. The F-Value will be used to establish the appropriateness of the model as a whole in explaining the relationship between audit risk and degree of customization. A low P-Value will allude to a higher chance of relationship between the two variables rather than chance. An ANOVA test will be done to compare the various audit companies against the stated parameters.

3.8 Data Validity and Reliability

So as to ensure that the questionnaire questions are well understood and responded to by the respondents a pretest of the questionnaire will be carried out. This will ensure reliability by examining if the questionnaires are consistently interpreted. Any other researcher who undertakes the same study and uses the same instruments for measurement should achieve the same result. The accuracy of the rating scales will also be examined to ensure they give the respondents adequate response options to the various questions.

Systemic errors in responding to the questionnaire will be avoided through proper and logical

ordering of the research questions and ensuring there could only be one interpretation to the question asked. In addition it shall be ensured that questions asked are in response to the particular research questions in this study. This will ensure internal validity of the research and as such accurate conclusions will be drawn from the research conducted.

External validity ensures generalization of the study, though from this research the findings will be generalizable to the extent of companies that use Navision ERP system. For this to be possible the studied sample should be representative of all the industry players. This has been done by drawing the samples from the big four key industry sectors. Convenience sampling has been chosen to ensure with each category to ensure at least the minimum number required for the sample is interviewed. This will ensure this study can be generalized across all companies that use Navision ERP systems Bias in responding to the questionnaire will be avoided through triangulation. This will entail having different respondents respond to the same questions. In this study, two groups of respondents have been identified namely, the internal auditor and the IT experts who handle the ERP within organizations. The responses will then be aggregated to ensure any bias from any respondent is minimized. This will ensure internal validity of the research and as such accurate conclusions will be drawn from the research conducted.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the data analysis, findings, interpretations and presentation.

4.2 Response Rate

The study targeted ten companies from the manufacturing sector, financial sector and distribution. Out of the 30 questionnaires distributed only 23 were filled and returned. This translated to a response rate of 77%. According to Mugenda and Mugenda(2003), the statistically response rate for analysis should be atleast 50%.

Table 4.1: Response Rate

	Frequency	Percentage
Response	23	77
Non Response	7	23
Total	30	100

4.3 Descriptive statistics

This section provides results on measures of central tendency of the variables; documentation, audit team involvement, components reuse, change management process adherence and the level of fit that were being measured in the study.

4.3.1 Respondents Department

The study sought to establish the department the respondents worked in. The findings are shown in the table below.

Table 4. 2: Respondents Department

	Frequency	Percentage
Internal audit	11	48
IT	12	52

The respondents that worked in the internal audit were 48% while 52% worked in the IT department. This shows that all the respondents involved in the system were familiar with the topic of study.

4.3.2 Company's Core Business

The study sought to establish the company's core business area. The findings are shown in the table below.

Table 4.3 Company's Core Business

	Frequency	Percentage
Financial	8	35%
Manufacturing	9	39%
Distribution	6	26%
	23	100%

4.3.3 ERP System Implementation

The study sought to establish whether the companies had implemented the Navision ERP System in your company. All the company said that they had installed the Navision ERP System in their company at the time of the study.

4.3.4 ERP System Customization

The study sought to establish whether the companies had customized the ERP system since its installation. All the companies said that they had customized the ERP system since its installation.

4.3.5 Need for Customization

The respondents were asked which of the statements below best describe why they customized their ERP system

Table 4.4: Customization Description

	Frequency	%
Align the ERP system processes to changing business process	10	43%
Align the ERP system processes to regulatory/policy changes.	6	26%
Factor in controls in the ERP system process to mitigate risk of loss	7	30%

Those respondents that said that their companies customized their ERP system so as to align the ERP system processes to changing business process were 43%, 26% said so as to align the ERP system processes to regulatory/policy changes and 30% said so as to factor in controls in the ERP system process to mitigate risk of loss.

4.3.6 Change management process during customization

The respondents were asked the extent to which they agreed whether there was a clear laid out process for carrying out system customizations. The responses are shown in the table below

Table 4.5: Process for System Customization

	Frequency	Percentage
Strongly agree	6	26%
Agree	12	52%
Neutral	3	13%
Disagree	2	9%
Strongly disagree	0	0%
	23	100%

The respondents that strongly agreed that there was a clear laid out process in the company for carrying out system customizations were 26%, 52% agreed, 13% were neutral and 9% disagreed. There were no respondents that strongly disagreed. Furthermore the respondents were asked how often customizations were authorized before they began. Table 4.6 has the findings

Table 4. 6: Customization Authorization

	Frequency	Percentage
Always	4	17%
Usually	12	52%
Half the Time	5	22%
Seldom	2	9%
Never	0	0%
Total	23	100%

The respondents that said that customizations were always authorized before they began were 17%, 52% said they usually were authorized, 22% said they were authorized half the time

while 9% said they were seldom authorized. There were no respondents that said that customizations were never authorized.

4.3.7 Audit Team Involvement

The study sought to establish how often the system customizations were verified by a member of the audit team after they are implemented by programmers.

Table 4. 7: Audit Team Involvement	Frequency	Percentage
Always	11	48%
Usually	8	35%
Half the Time	3	13%
Seldom	1	4%
Never	0	0%
Total	23	100%

The respondents that said that system customizations were always verified by a member of the audit team after they are implemented by programmers were 48% , 35% said usually, 13% said half the time and 4% said seldom. There were no respondents that said never.

4.3.8 Level of Documentation

The respondents were asked whether the system customizations were documented. All the respondents said that the system customizations were documented. In addition the study sought to establish whether documentations done for customization provide enough detail for even those

not involved in the customization to follow through on the process. The responses were as below:

Table 4. 8: Customized Documentations

	Frequency	Percentage
Strongly Agree	9	39%
Agree	6	26%
Neutral	5	22%
Disagree	2	9%

Strongly Disagree	1	4%
Total	23	100%

The respondents that strongly agreed that documentations done for customization provide enough detail for even those not involved in the customization to follow through on the process were 39%, 26% agreed, 22% were neutral, 9% disagreed and 4% strongly disagreed.

4.3.9 Components Reuse

The study sought to System customizations are designed in a way they can be reused for similar purposes if requested in the future.

Table 4.9: System Components Reuse

	Frequency	Percentage
Strongly Agree	4	17%
Agree	9	39%
Neutral	6	26%
Disagree	3	13%
Strongly Disagree	1	4%
Total	23	100%

The respondents that strongly agreed that system customizations are designed in a way they can be reused for similar purposes if requested in the future were 17%, 39% agreed, 26% were neutral, 13% disagreed and 4% strongly disagreed. In addition the study sought to establish whether new system components are only developed when none exists in the current system that can meet the current requirement. The findings are shown in table 4.10

Table 4.10: New System Components

	Frequency	Percentage
Strongly Agree	6	26%
Agree	6	26%
Neutral	4	17%
Disagree	4	17%
Strongly Disagree	3	13%
Total	23	100%

The respondents that strongly agreed that new system components are only developed when

none exists in the current system that can meet the current requirement were 26%, another 26% agreed, 17% were neutral and another 17% disagreed while 13% strongly disagreed.

4.3.10 Level of fit

The respondents were asked whether Navision ERP best fits the nature of their company's business. The responses are shown in the table below.

Table 4.11: Navision and Company Business

	Frequency	Percentage
Strongly Agree	15	65%
Agree	8	35%
Neutral	0	0%
Disagree	0	0%
Strongly Disagree	0	0%
	23	100%

All the respondents agreed that Navision ERP best fits the nature of their company's business with 65% strongly agreed and 35% agreed. There were no respondents who were either neutral or disagreed.

4.3.11 Level of Audit Risk

The study sought to establish over how many hours the following components customizations have been developed. The findings are in table 4.12

Table 4.12: Components Development

Component	Finance		Manufacturing		Distribution		Overall	
	F	%	F	%	F	%	F	%
Reports	7	14%	5	10%	8	16%	6.67	13%
Interfaces	8	16%	6	12%	3	6%	5.67	11%
Extension	10	20%	3	6%	5	10%	6.00	12%
Conversion	8	16%	6	12%	5	10%	6.33	13%
Workflows	5	10%	3	6%	8	16%	5.33	11%
	38	76%	23	46%	29	58%	30	60%

4.4 Inferential Statistical Analysis

In this study, a multiple regression analysis was conducted to test the influence among predictor variables. The research used statistical package for social sciences (SPSS V 21.0) to code, enter and compute the measurements of the multiple regressions.

4.4.1 Analysis of Variance

The variation in the level of audit risk was evaluated between the three groups studied i.e. Manufacturing, distribution and finance. The results are as shown in the table below:

Table 4. 13: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.966	5	1.593	10.845	0.002
	Residual	3.504	17	0.206		
	Total	11.47	22			

The probability value of 0.002 indicates that the regression relationship was highly significant in predicting how customization affects audit risk. The F critical at 5% level of significance was found to be 10.845. This shows a high variance between the three groups namely finance, manufacturing and distribution as compared to that within each group. This shows the appropriateness of treating the groups independently. It also shows different levels of appropriateness of the Navision ERP system by the different industries. This shows that the variability of the means of the audit risk between the various industries is significant.

4.4.2 Goodness of Fit

The percentage of audit risk variation explained by the linear model developed was established. R-Square which is the coefficient of determination is a commonly used statistic to evaluate model fit. R-square is 1 minus the ratio of residual variability. The adjusted R^2 , also called the coefficient of multiple determinations, is the percent of the variance in the dependent explained uniquely or jointly by the independent variables. This is as shown in the table below:

Table 4.14: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.882	0.778	0.761	0.106

From the above, 77.8% of the changes in level of audit risk could be attributed to the combined effect of the independent variables. This shows that further study should be done on other factors not included in this study contributing 22.2% of the other factors that influence the level of audit risk.

4.4.3 Regression Analysis

The statistical relationship between the predictor variables and the response variable hereby the audit risk was developed through regression analysis. The result is as shown in the table hereby presented.

Table 4. 15: Regression coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	P - Sig.
	B	Std. Error	Beta		
(Constant)	1.554	0.289		5.377	0.001
X_1 – Documentation	0.943	0.178	0.164	5.297	0.000
X_2 – Audit Team Involvement	0.632	0.254	0.231	2.488	0.004
X_3 – System Reuse	0.548	0.224	0.099	2.446	0.003
X_4 – Change process adherence	0.728	0.452	0.301	1.610	0.000
X_5 – Level of fit	0.754	0.637	0.344	1.183	0.002

Analysis of this study was done based on the model below:

$$Y = 1.554 + 0.943X_1 + 0.632X_2 + 0.548X_3 + 0.728X_4 + 0.754X_5$$

Where: Y – Audit Risk of the ERP

The regression equation above has established that taking all factors into account (Documentation, Involvement, Reuse, Adherence, Level of fit) constant at zero the level of audit risk will be 1.554. The findings presented also show that taking all other independent variables at zero, a unit increase in the documentation would lead to a 0.943 increase in the level of audit risk. Further, the findings shows that a unit increases in level of involvement would lead to 0.943 increases in the level of audit risk. In addition, the findings show that a unit increase in the extent of reuse would lead to a 0.548 increase in level of audit risk. The study also found that a unit increase in adherence would lead to a 0.728 increase in the level of audit risk. Finally a unit increase in the level of fit would lead to a 0.754 increase in the level of audit risk. Overall this notwithstanding, all the variables were significant as the P-values were less than 0.05 an indication that model was significant.

4.5 Summary and Interpretation of Findings

The findings from the current study provide evidence that Navision ERP system was used across the three industries of study namely manufacturing, financial and distribution. It was however noted that the system was least prevalent in the distribution industry. All the companies that were utilizing the Navision ERP system had also customized the system to some extent. Most companies customized the system to align the ERP system with the changing business process rather than for regulatory conformance or factoring in controls to mitigate risk.

It was observed that most companies had a change management process for customization that was adhered to. In addition the audit team was always involved though to a varying extent. Up to 50% of the time when customizations needed to be done the audit team was involved. It was found that the level of documentation was mostly insufficient and wasn't as informative for reference to be made later. The research revealed that the level of components reuse was generally high. The level of fit of the Navision ERP system was generally high.

All the five variables have a significant impact on the level of audit risk since they all have P values less than 0.05. The level of documentation is the highest contributing factor among the five variables as show from the regression developed with a coefficient of 0.943. The difference in audit risk between the three industries namely finance, distribution and manufacturing was found to be significant from the analysis of variance done which yielded an F value of 10.845. The five predictor variables namely (Documentation, Involvement, Reuse, Adherence and Level of fit) explained 77.8% of the changes in the audit risk as shown from the goodness of fit test.

Liang, Saraf, Hu, &Xue (2007b) conducted a research that evaluated the organizational impact of ERP systems after the system has been implemented and is in use. The study states the extent to

which the organization will experience benefits will be tied to the level of interdependence and differentiation among various units of an organization.

This study shows that the level of fit has a significant impact on the level of audit risk. This is in agreement with the study done by Akkermans & van Helden (2002) which states the level of fit of ERP systems in organizations is a key factor in ERP success. Fit of an ERP system depends on whether the system is suited for large or small organizations. Some systems may be suited for particular industries while some are suited for certain parts of the world. This study showed that the Navision ERP is suited for the industries studied in the following descending order of fit: manufacturing, then distribution and finally the finance industry. This is shown from the obtained results since the higher the percentage of customization required, the lower the level of fit.

This study showed that a key driver for implementing ERPs is to align the ERP system processes to changing business processes. This contradicts the study done by Mundy & Owen (2013) which highlights that ERP systems are mainly customized to facilitate regulatory compliance through the incorporation of various controls. The study focuses on the role, use and purpose of the ERP system by addressing concerns about ERPs' capacity to meet the requirements of legislative compliance.

From this study it was shown that the industries of study had a higher percentage of customization than the maximum accepted level of 30% as indicated by Arif et al., (2010). According to Arif et al., (2010) from a review of many studies, advocates for a minimum

customization levels as the higher the customization the lower the implementation success of ERPs.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

The aim of this study was to analyze the effect of customization on the audit risk of accounting information systems with a key focus on the Navision ERP system. It was revealed that ERP systems get more complex as they are further customized to align ERP system capabilities with the processes in an organization (Huang, Chen, Chiu, & Hsieh, 2012). The audit risk posed by implementation of ERP systems was also highlighted since they were considered to be the largest and most complex projects an organization could undertake Haddara(2012). The recommended maximum allowable customization according to Arif et al., (2010) was stated as 30%.

Key variables were identified that affect the audit risk of the ERP system due to customization, namely: the level of documentation of customizations, involvement of the audit team, reuse of various components, adherence to the change management process and the level of fit of the deployed ERP within a particular business context. A cross-sectional approach to research was adopted and focused on studying the Navision ERP system across three industries namely finance, manufacturing and distribution. This took on a qualitative approach with questionnaires as the main method of collecting data yielding a response rate of 77%.

The data obtained was analyzed mainly through descriptive and inferential statistics. It was found that 46% of companies customized ERP systems to align the ERP to changing business process. The statistical relationship between the predictor variables and the audit risk was

developed through regression analysis with a goodness of fit of 77.8%. Of the five variables studied the level of documentation was found to be the most critical variable.

5.2 Conclusion

Most companies face a high inherent risk since Navision ERP system out-of-the box doesn't meet most industries process requirements and hence would require customization for the above to be achieved. It was also noted that business process reengineering was not prevalent among most companies. This in turn drives up the inherent risk of the ERP system as any customization introduced into the system almost always compromises on the controls in-built within the system that are developed from industry best practice.

From the results it is also adequate to conclude control risk was generally low since most companies have proper oversight of the customization process. The audit team checks to ensure the various controls put in place to minimize risks that arise due to customization are followed through during this process. The insufficient documentation further increases the control risk. Prevalent re-use of poorly documented changes was a source of risk in customization. Reuse of components that are not well documented led to increased audit risk through increased inherent risk. Reuse of components means certain components may be used and yet they have a wider scope of items they may affect. Majority of the respondent's found that the Navision ERP system best suit their nature of operations.

Descriptive results on the level of customization in the ERP systems of the studied firms indicate that the acceptable level of system documentation was found to have been exceeded beyond the maximum acceptable level of 30% as per Arif et al., (2010). This shows that most organizations are rigid and rarely consider the option of business process reengineering so as to ensure that their ERP system functionality is aligned to their business process.

5.3 Recommendations

Organizations should consider business process reengineering on adoption of ERPs as a first option so as to minimize the inherent risk introduced when the ERP is customized. This calls for a thorough evaluation requirements at the point of system acquisition. This evaluation is not only from the organizational requirements perspective but system capability perspective out-of-the-box. Organizations should consider how much they should change their process if such systems were deployed so as to keep system customization to the minimal.

In order to minimize control risk due to insufficient audit team involvement during customization the following should be put in place: Internal auditors should be adequately versed with ERP systems and the business process of the particular organization. In addition all desired system customizations should be channeled through the audit team first who can then forward to the programmers upon evaluation. Upon completion this should be channeled back to the users through the audit team. This will also help to ensure before an issue is closed out the appropriate level of documentation is achieved so that in future anyone could make reference to the same if any change is required.

Components reuse only reduces inherent risk in customized ERPs if a proper and detailed documentation process is put in place and adhered to. So as to enhance components reuse systems should be customized in a very modular way which makes it easy to reuse components. This will not only reduce the inherent risk of subsequent customizations but also reduce time wasted in reinventing the wheel every time a new ERP functionality is required for another department within the same organization.

5.4 Limitations of the Study

The Navision ERP system has got various modules for different functions. This study was limited to only those companies that had deployed the appropriate modules within the Navision ERP system for the appropriate processes or functions. Companies choose which modules to purchase at the point of acquisition. Some organizations were found to have a high level of ERP audit risk due to customizing the system to achieve functionalities that are already available out-of-the-box in other modules of which organization hasn't acquired. This interfered with the level of fit measure as one would get two companies in the same industry but quite varied levels of fit. Much as companies extend their operations over their lifetime they do not always purchase additional required modules that already suit the specific functions.

This study was also limited to specific versions of the Navision ERP. These versions included Navision 2009, 2013 and 2013R2. This left out the earlier Navision versions including 3.7, 4.0 and 5.0. The three aren't covered in the study due to the limitation of functionality and features in the earlier versions. This was done since for the particular versions of Navision to be appropriate they would have to be heavily customized which would have distorted the findings from this research.

Determination of the audit risk of the ERP system was dependent on proper on availability of proper records for all the customization efforts undertaken by the organization. This information included details of both the modules customized and the number of hours taken. To this effect this study can't be applied in cases where there were poor records on the number of hours spent

in customizing various components of the ERP. In some companies where such information was found totally unavailable the data could not be used for the study.

5.5 Suggestions for further studies

This study focused on companies as the unit of study which left out the input of external auditors. External auditors especially where Information System Auditors are involved determine the audit risk of ERP systems. This would give a direct measure for audit risk of an ERP system rather than relying on an indirect measure such as the level of customization of the system.

This study concentrated only on a few of the companies in the financial, manufacturing and distribution sector. This study recommends that in the future a similar study be conducted across all companies in the sector so as to generalize the findings.

The study also recommends that in the future a study be conducted on the effectiveness of the Navision ERP system across various industries. This will guide companies in selection of the Navision ERP to ensure a high level of fit between the system capabilities and business process. This will be effective in highlighting the limitations of Navision ERP system across various industries. In addition recommended customizations and approaches will be highlighted to adapt the Navision ERP system to various industries.

The study also recommends segmentation of the companies to be studied by size. The Navision ERP system is built for Mid-sized companies. An appropriate parameter for size needs to be established be it by revenue or extent of operations. The Navision ERP system has various modules for different functions and companies choose which modules to purchase at the point of acquisition and during the life of the system.

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Appendix 1: Company Questionnaire Introduction and questions

Letter of Introduction

I am a master's student undertaking a research project to investigate the effect of customization on the audit risk of Accounting Information Systems with a focus on ERP systems. Companies included in this study include those offering financial services, those involved in manufacturing and those in distribution. You are invited to take part in this study.

Participation in this research study is purely voluntary and there are no costs to you for being a part of this study. You are free to decline to the entire study or any particular questions within the study. The questionnaire will take about 10 minutes of your time. Though there may be not immediate benefits in taking part in the study, the conclusions drawn will be of utmost benefit by providing insights into the risks that could be attributed to the customization of ERPs and how they can be mitigated.

The survey is anonymous and responses from your companies shall only be available to their corresponding audit firms. The actual individuals responding to the survey will be kept anonymous ensuring no possibility of knowing the participants of the study after upon successful completion of the questionnaire. The questionnaire will be administered and collected by upon completion by MondEd Rao, who is my research assistant.

If you have any questions about the study, please kindly contact Desmond Rao, on desmond.rao@gmail.com.

Kindly respond to the following questions as is appropriate.

1. Which of the two departments do you belong to?

Internal Audit IT

2. Which of these categories best describes your company's core business area?

Financial Services Manufacturing Distribution (Buy & Sell)

3. Have you implemented Navision ERP System in your company?

Yes No

4. Have you customized the ERP since you implemented it?

Yes No Not Sure

5. Which of the following describe why you customize your ERP system?

Align the ERP system processes to changing business process

Align the ERP system processes to regulatory/policy changes.

Factor in controls in the ERP system process to mitigate risk of loss.

Other

If other describe briefly

.....
.....

6. There is a clear laid out process for carrying out system customizations?

Strongly Agree Disagree Uncertain Agree Strongly Agree

7. How often are customizations authorized before they begin?

Always Usually Half the Time Seldom Never

8. How often are system customizations verified by a member of the audit team after they are implemented by programmers?

Always Usually Half the Time Seldom Never

9. Are system customizations documented?

Yes (Go to question 8) No (Go to question 12) Not Sure

10. Documentations done for customization provide enough detail for even those not involved in the customization to follow through on the process?

Strongly Agree Disagree Uncertain Agree Strongly Agree

11. System customizations are designed in a way they can be reused for similar purposes if requested in the future?

Strongly Agree Disagree Uncertain Agree Strongly Agree

12. New system components are only developed when none exists in the current system that can meet the current requirement?

Strongly Agree Disagree Uncertain Agree Strongly Agree

13. Navision ERP best fits the nature of your company's business?

Strongly Agree Disagree Uncertain Agree Strongly Agree

14. Over how many hours have the following components customizations been Developed (Circle the applicable range for each component)?

Component	None	Simple	Medium	Complex	Very complex
Reports	0	01-56	57-84	85-157	>158

Interfaces	0	01-44	45-166	>166	
Extension	0	01-44	45-103	104-227	>227
Conversion	0	01-90	91-212	>213	
Workflows	0	01-57	57-71	>71	

Thanks for participating in this study.