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**FACTORS INFLUENCING SOFTWARE AS A SERVICE ENTERPRISE
RESOURCE PLANNING SYSTEM IMPLEMENTATION.**

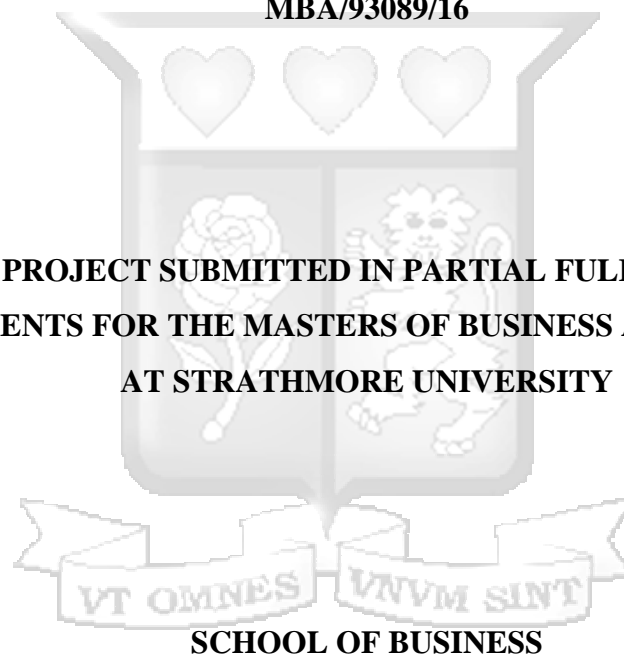
**CASE: SMALL AND MEDIUM ENTERPRISES IN MANUFACTURING
INDUSTRY IN NAIROBI COUNTY**

BY

LYDIA NJAAGA

MBA/93089/16

**RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE MASTERS OF BUSINESS ADMINISTRATION
AT STRATHMORE UNIVERSITY**



STRATHMORE UNIVERSITY

NAIROBI, KENYA

May 2019

DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the dissertation contains no material previously published or written by another person except where due reference is made in the thesis itself.

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Lydia Njaaga
May 2019

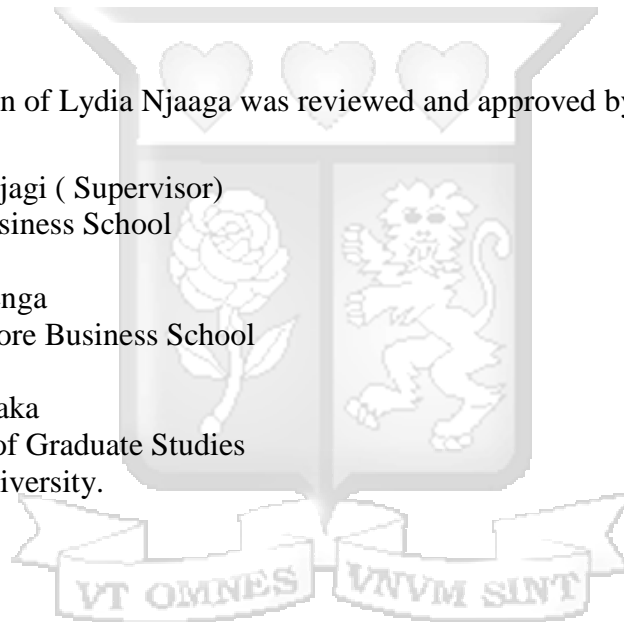
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ABSTRACT

Software as a service is a model that has recently been used to offer software systems in the world. The purpose of this research was to investigate the factors influencing implementation of ERP system as a SAAS among Small and Medium enterprises within the Manufacturing Industry in Nairobi County. Specifically, the study sought to establish the organizational, environmental and technological factors influencing the implementation of ERP system as a SaaS among SMEs within the manufacturing industry in Nairobi County. This research used a descriptive survey design. The study population consisted of all the 134 SMEs registered with Kenya Association of Manufacturing (KAM) within the manufacturing sector in Nairobi, Kenya. The study sampled all the SMEs registered with KAM and then selected one respondent who was to be selected randomly to represent each SME. Hence, the sample size was 134 respondents. This study used primary data obtained from the original sources using questionnaires. The questionnaires were self-administered using the drop and pick later method and email. Data collected from the questionnaires was prepared, converted from responses to quantitative format for ease in analysis using statistical package for social sciences (SPSS). The statistics generated were descriptive statistics which included frequencies and percentages and inferential statistics which included correlation matrix and multiple linear regression. A multiple linear regression model was used to show the relationship between the independent and dependent variables. A pilot study was conducted in order to establish the validity and reliability of the questionnaire. In this study, the questionnaire was tested on 10% of the sample to ensure that it is relevant and effective. The subjects participating in the pilot study were not included in the final study to avoid survey fatigue. The study results revealed that environmental factors and implementation of ERP system were positively and significantly related. The results revealed that organization factors and implementation of ERP system were positively and significantly related. The study concluded that technological factors and implementation of ERP system were positively and significantly related. The study concluded that SMEs within the manufacturing industry in Nairobi were faced by financial constraints. The study recommended that the ministry of industrialization and enterprises development must strive to improve employees' knowledge and skills to ensure successful ERP implementation. This can be done through user training before the system goes live and continuous training post implementation to fill the knowledge gaps. Top management should also provide leadership during the implementation process and provide support to the project team.

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LIST OF ACRONYMS/ ABBREVIATIONS

BKBK	Buy Kenya Build Kenya
ERP	Enterprise Resource Planning
GPD	Gross Domestic Product
IS	Information System
IT	Information Technology
KAM	Kenya Association of Manufacturing
KEPSA	Kenya Private Sector Alliance
KITP	Kenya Industrial Transformation Programme
KNBS	Kenya National Bureau of Statistics
SaaS	Software as a Service
SPSS	Statistical Package for Social Sciences
TAM	Technology Acceptance Model



DEFINITION OF TERMS

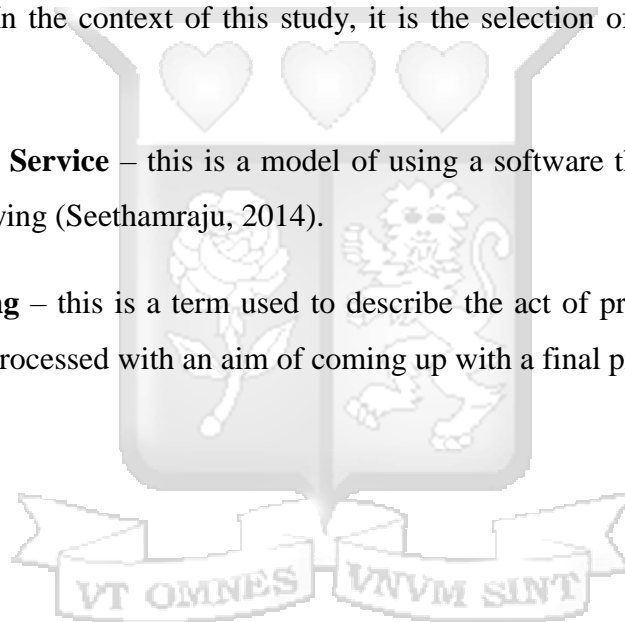
Enterprise Resource Planning System –it is a package of integrated software applications used to manage transactions through organization wide business processes by using a common database, standard procedures and data sharing between and within functional areas (Ghofaili & Al Mashari, 2014).

Small and Medium Enterprise – Those enterprises having between 10 and 99 employees. Small have 10-49 employees and medium have 50-99 employee (Bibu & Sala, 2008).

Adoption – refers to the act of selecting something for use by an individual or an organization. In the context of this study, it is the selection of an innovation (Eneh, 2010).

Software as a Service – this is a model of using a software through subscription as opposed to buying (Seethamraju, 2014).

Manufacturing – this is a term used to describe the act of production whereby raw materials are processed with an aim of coming up with a final product.



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DEDICATION

To God almighty for his mercies and blessings. To My dear husband Alex Njaaga for your moral support and your love that saw me through this process. To my dear daughter Shania Njambi and my Son Ethan Mbugua, may you learn the values of hard work, humility and perseverance. To my dear parents, Godfrey Thangi (Posthumously) and Loise Thangi, who nurtured in me the seed of humility, hardwork, integrity, perseverance, excellence and many more values. To my brothers for encouraging me on this journey with great belief.



CHAPTER ONE

INTRODUCTION

1.0 Introduction

This study is about implementation of ERP system as a Software as a Service among Small and Medium enterprises within the Manufacturing Industry. In recent past cloud has been the main technology that is being used to transform business. Most of the companies are keen to have a system that can automate how they do things in the organization. Enterprise Resource Planning (ERP) is such a system that helps transform the business.

As technology is only considered an enabler for the business, then it only makes sense if companies were to focus on their core business and have other people who are specialists focus on the management of their core systems. To achieve this technology has evolved over time and now more than ever the technology companies such as those who manufacture the ERP have adopted the cloud. Through cloud, businesses do not have to purchase software's instead, they lease the use of the software as and when they need it. The new model of accessing the software as a service is what most of the software providers are encouraging the businesses to adopt.

The study hence focuses on factors affecting software as a service enterprise resource planning system implementation. Case: Small and medium enterprises in manufacturing industry in Nairobi County.

1.1 Background of Study

In the whole world, businesses have so far understood that so as to make it in an exceptionally aggressive market, they have to embrace modernization in their operations (Chatterjee, 2015). Byrd et al., (2006) showed that for the little and medium ventures to accomplish the best, they have to use their assets. This is reachable through the utilization of innovation to robotize their activities. Innovation helps the business rapidly change and improve their presentation (Seethamraju, 2015).

In today's' reality, most business pioneer's needs are for overseeing the development and sparing expenses. This is best accomplished through taking the current piece of the

pie, by comprehension and associating with clients better, improving items and procedures. Sparing costs means bringing down the spending and expanding income by taking out wasteful aspects, computerizing forms and improving profitability. Reception of innovation encourages business to understand these favourable circumstances (Hudd, 2016).

One such innovation framework is Enterprise Resource Planning (ERP). On the off chance that the ERP was viewed as a favourable position yesterday, it has now turned into a commitment today. The change from "decent to have" to "must have" is an immediate result of the globalization of the business sectors. Today, an organization without the ERP is denied of the effectiveness contrasted with its rivals, and the choice to actualize one largely affects its association execution (Hudd, 2016).

There are various ways in which an organization can get access to the ERP system. These being through purchase of an On-Premise ERP system, whereby an organization makes a decision to acquire the ERP system and keep it in the organization infinitely, or the option of getting software as a service (SaaS) otherwise known as cloud Enterprise Resource Planning system, whereby an organization subscribes and uses an already developed ERP system that has been hosted in a cloud with minimal or no customization (Seethamraju, 2015).

ERP in SaaS differs from on-premise ERP in the sense that ERP in SaaS is availed to an organization on subscription basis while the on-premise one is installed in an organization's computers. Normally, the on-premise ERP is expensive and denies an organization access to updates and newer versions are installed at additional cost. On the other hand, ERP in SaaS allows an organization to get subsequent updates as innovation keeps on changing with new technology (Dubey and Wagle, 2007).

As per Gattiker and Goodhue (2004), organizations need to spend a lot of cash so as to secure the most appropriate ERP for their association. Thus, there is need to identify an ERP system that best suits the organization operations. Subsequently, the partners who incorporate the financial specialists, the business, the clients need to receive the system and ensure that it is being used completely in the business without the clients imagining workarounds. The framework integrator who executes the ERP framework

likewise ought to have the option to comprehend the business prerequisites to convey the normal result (Rashid, Ishawi, and Mashare, 2012).

As indicated by Mukwasi and Seymour (2015), ERP system have enrolled high disappointment rates before. This occasionally has been contributed by the inability to execute appropriately, the wrong decision of the undertaking asset arranging framework, and non-eagerness of clients to utilize the framework. Before ERP system execution had dependably been a bad dream for most business as in addition to the fact that it was costly to obtain, it likewise took long to actualize. This constantly stressed the organizations in wording for human and money related assets (Mukwasi and Seymour, 2015).

In most instances an ERP system doesn't rhyme well with the business procedure of the Small and Medium Enterprises (SME's) necessitating a change of the way of doing things. Identified with the business procedure dangers is the danger of neglecting to upgrade business forms, misalignment of business procedures and inability to help cross association plan (Mukwasi and Seymour, 2015). Aiming at providing a way out to this dangers, Oracle, Microsoft, and SAP are giving customized and reasonable On-Premise arrangements on SaaS-based models. With radical changes in the innovations and rivalry compelling numerous Small and Medium Enterprises to select better advances, SME's are currently grasping SaaS for such favourable circumstances as institutionalization, coordinated best practice forms, data permeability and ongoing information. More SMEs are additionally going advanced and development has turned into a key column in the majority of their business subsequently the motivation behind why as most associations get the trust in putting resources into the ERP system (Seethamraju, 2015).

This has made SME's choose to change their way of operation to be in-tandem with the ERP system provided. In this case the management have to retrain and prepare their employees so that they don't resist change and embrace adoption of ERP (Lewandowski et al., 2013). Nonetheless, in the event that the ERP system is incompatible with the SME requirements the providers customize it to their needs. At the point when that occurs, by and large, difficulties may emerge with the ERP system clients, or once in a while with the ERP system supplier is compelled to embrace the manner by which the business works. This is the place there emerge difficulties of

oddballs which at last turns into a major test for the ERP framework's reception (Lewandowski et al., 2013).

For the clients, receiving to the manner in which the ERP is made isn't constantly greet. This thusly makes the clients oppose ERP system. Another test at that point comes up and this is to do with the client acknowledgement. As indicated by Seethamraju (2015), the general selection of the ERP framework is in this way stressed, and the business is then not ready to understand the profits sooner as would have been before anticipated. At times, clients devise workarounds as they like to be in their solace. At the point when that occurs, you find that regardless of the business has put resources into an ERP framework, it isn't being utilized inside the association. This turns out to be even a greater test when the business demands for reports as the workarounds and the primary framework may some of the time not be adjusting admirably (Seethamraju, 2015).

1.1.1 Enterprise Resource Planning Systems

Enterprise Resource Planning (ERP) system gives business reconciliation over the whole business. An ERP system is a business programming system which enables an organization to incorporate and robotize the greater part of its business capacities and procedures, for example, account, showcasing, HR, coordination and deals (Mukwasi and Seymour, 2015). The systems additionally give a connection to the different business divisions which permits cooperation among the offices. Previously, most business offices worked in storehouses one office always being unable to determine what the other division is doing. Notwithstanding, in the present business condition that is profoundly aggressive, it's basic that different business divisions draw in with one another (Mukwasi and Seymour, 2015).

ERP systems flourish in having the option to increase the value of the association by guaranteeing there's a legitimate use of their assets. Through joining of the business assets these systems empower organizations to perform different errands easily, for example, item arranging, obtaining, generation process, stock control, money related control, human asset control, and client control (Chen, Lee, and Tu, 2016). In perspective on business process reengineering, ERP can be an answer for business procedure designing where business can accomplish their organization vision, targets, and task methodology and plan of action (Davenport, 1998).

As associations keep on looking for approaches to lessen costs and use accessible innovation to accomplish wanted goals, elective methods for actualizing ERP systems have must be investigated (Hofmann, 2008). Specifically, the Software as a Service (SaaS) model has risen as a genuine option in contrast to executing in-house ERP systems. ERP SaaS has been actualized effectively in Asia Pacific Countries, Europe, and parts of North America (Guo, 2009). Notwithstanding, ERP appropriation is seemingly, even more, a test for associations in emerginging nations, for example, South Africa, given the surprising expense of capital and the deficiencies of IT abilities (Nthoiwa, 2010).

The significant advantage of ERP SaaS is low usage costs and an adaptable valuing model that does not require a noteworthy capital expense. Notwithstanding, in contrast with different SaaS applications, the rate at which ERP SaaS is being embraced is low (Benlian, Hess, and Buxmann, 2009). The purpose behind the moderate appropriation of ERP SaaS shifts from issues around security and customisation to incorporation and different concerns (Burrel, 2009).

1.1.2 Implementation of ERP Systems by Small and Medium Enterprises

Cloud-based ERPs have turned into a distinct advantage for many associations everywhere throughout the world because of its numerous advantages. Cloud-based ERPs help associations maintain their business better, improving effectiveness, giving precision in detailing and improved client and provider connections. The adaptability of access utilizing the web makes it simpler for access to the systems by the clients from any place they are using a web-empowered gadget (Makathimo, 2016).

It is notable that organizations' biggest challenge is maintaining its operations cost because feasible studies indicate that most SMEs spend a lot of money in implementing proper information technologies. Cloud-based ERPs seek to address this challenge as the implementation and operation costs are greatly reduced since the users are now paying for the service rather than infrastructure and software costs. Gartner Research Circle survey (2013) shows the willingness of some organizations to move their core ERP systems to the cloud.

It is therefore advisable that SMEs in Nairobi adopt cloud computing as a paradigm that will add value to their business operations. For instance, cloud computing will increase

SME's flexibility, scalability, and this will reduce its operation cost. Most importantly, cloud computing will enhance the company competitive advantage by enabling it to access sophisticated technologies that will improve its business operation in the global market. In addition, these benefits will help SMEs attain business growth as they become more productive and innovative and this helps the organization focus on its core business (Bois, 2010).

It is notable that cloud computing is applicable for both starting SMEs and the existing ones because cloud service providers give software application and network facilities that are tailor made to fit the unique needs of an organization. The cloud service providers rely on massive centralized data centers that help the SMEs to achieve the desirable economic of scale. Therefore, it is advisable that SMEs that have not adopted cloud computing in Kenya to make it a priority as cloud computing in the global market grows at an annual rate of 28% since 2014 (FSD Kenya, 2015).

As a result of the usefulness of cloud computing, over a million companies in the world are spending on cloud services to enhance their business operation. As such, this makes cloud computing a major trend in the business industry and a business strategy for organizations that want to obtain a competitive edge. In fact, a study carried out by Deloitte (2011) cited that tax and cost advantages as the significant reason why SMEs in Kenya continue to uptake cloud-based ERPs. Despite these benefits, the survey reports cloud computing adoption in SMEs is still limited with legislation issues, data privacy and lack of IT knowledge within organizations (Deloitte, 2011).

Presentation of big business asset arranging system in Small and Medium Manufacturing Industries (SMMIs) had honed SMMIs' market center, to turn out to be increasingly productive, to bridle their HR better, and to improve their aggressiveness. ERP usage prompts better item quality and that SMMIs can actualize it as successfully as bigger businesses. There is a general consciousness of the significance of SMMIs for a nation's financial development, mechanical improvement, and employable.

1.2 Problem Statement

Programming as a Service (SaaS) is increasing expanding acknowledgement and is along these lines changing how ERP systems are conveyed and devoured (Haselmann and Vossen, 2011). For SMEs, this is viewed as the best chance to exploit the abilities

of an ERP system without the speculation and the board expenses related to the on-premise model (Seethamraju, 2014). In any case, SMEs have a major test in both executing and receiving the ERP inside their associations. Notwithstanding the presence of the SaaS model of giving the ERP systems notwithstanding the On-Premise Enterprise Resource Systems, reception of the systems has kept on being a major test (Ghofaili and Al Mashari, 2014). Mukwasi and Seymour (2015) portrayed these difficulties to incorporate lacking authoritative fit, insufficient aptitudes, deficient client association and preparing, lacking administration technique and abilities, and lacking programming systems plan.

From the writing audit, different research has been directed to recognize the different ERP usage structures however very little has been referenced on the reception of the ERP systems particularly the Software as an administration ERP. For example, an examination by Muchina (2018) led an investigation on ERP selection and hierarchical productivity, Balance Score Card Approach among Manufacturing SMEs in Kenya. Another examination by Makathimo (2016) looked to decide the connection between cloud-based ERPs and authoritative execution of SMEs in Nairobi, Kenya while an investigation by Musyimi and Okelo (2015) tried to discover the appropriation of ERP systems in Kenya: an instance of chosen assembling firms in Nairobi metropolitan. This investigation tries to fill in this gap.

1.3 Research Objectives

1.3.1 General Objective

The purpose of this research was to establish the factors influencing the implementation of ERP system as a SAAS among Small and Medium enterprises within the Manufacturing Industry in Nairobi County.

1.3.2 Specific Objectives

The specific objectives of the study will be:

- (i) To establish the influence of organizational factors on implementation of ERP as a SAAS among SMEs within the manufacturing industry in Nairobi County.

- (ii) To investigate the influence of environmental factors on implementation of ERP as a SAAS among SMEs within the manufacturing industry in Nairobi County.
- (iii) To determine the influence of technological factors on implementation of ERP as a SAAS among SMEs within the manufacturing industry in Nairobi County.

1.4 Research Questions

The study will be guided by the following research questions

- i. What is the influence of organizational factors on implementation of ERP as a SAAS among SMEs within the manufacturing industry in Nairobi County?
- ii. What is the influence of environmental factors on implementation of ERP as a SAAS among SMEs within the manufacturing industry in Nairobi County?
- iii. What is the influence of technological factors on implementation of ERP as a SAAS among SMEs within the manufacturing industry in Nairobi County?

1.5 Scope of the Study

This examination was restricted to building up the components affecting the execution of the ERP framework as a SAAS among Small and Medium endeavours inside the Manufacturing Industry in Nairobi County. In particular, the examination tried to set up the hierarchical, ecological and mechanical components affecting the execution of ERP framework as a SaaS among SMEs inside the assembling business in Nairobi County.

1.6 Significance of the Study

The investigation will be of importance to the accompanying partners: associations inside the assembling business, SMEs, and the scholarly network. To begin with, this investigation will illuminate the associations trying to possess an ERP arrangement what are the key difficulties looked in the reception of the ERP frameworks as it is expensive which makes it necessary to get what is compatible with the business operations and thus get value for money.

This investigation will likewise help to inform SME's about other systems that being utilized in the manufacturing sector in Kenya. It will likewise help to inform on the practicality of use of SaaS model in the manufacturing sector. It will also help to benchmark the use of ERP among SMEs as the study will target users and non-users of ERP.

The investigation discoveries will likewise be valuable to the scholastic network by adding to the collection of writing applicable to the utilization of the SaaS model of programming arrangement. Remarkably, the discoveries of this study can likewise be summed up to the hypothesis. The exploration discoveries from this investigation may likewise give benchmark information that might be utilized to direct further research on topics related to this study.



CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter reviews literature related to implementation of ERP systems. This chapter anchored the study on theoretical and conceptual framework. The chapter also outlines the research gaps and the chapter summary.

2.1 Theoretical Review

This subsection identified two theories that are relevant to the study and inform the theoretical background for the study. The theories that informed this study include the diffusion of innovation theory and technology acceptance model.

2.1.1 Diffusion of Innovation Theory

Diffusion of innovation alludes to the correspondence of a thought which is viewed as novel to the individuals from a social framework through certain favoured channels (Rogers, 2003). The spread of new thoughts is affected by four factors which are: the genuine development, social frameworks, time and correspondence channels. Of most extreme significance is advancement need to pick up worthiness in a wide territory so as to be economical. As indicated by Fisher (1971), appropriation of advancement when mapped over the long haul frames an S moulded bend.

How fruitful a development will originate from the goals advanced by the social frameworks through five characterized steps which are; information, for example, advancement mindfulness and persistent picking up in regards to it; influence which means eagerness to have point by point learning concerning the advancement; goals, that is, thought of the preferences and detriments of the advancement and decision of whether to embrace the advancement; application which is an examination of how valuable the advancement will be lastly affirmation, which is possible choice on the consistent utilization of the advancement (Rogers, 2003).

As indicated by Sevcik (2004), the advancement selection procedure isn't moment yet requires some serious energy. He further contends that dissemination of development is affected by protection from change since it hinders the advancement appropriation process. Advancement reception procedure is affected by five noteworthy qualities in particular relative preferred position, similarity, multifaceted nature, discernibleness

and trialability (Rogers 1995). Rogers contends that the dimension of new developments selection relies upon the way where new association sees its relative bit of leeway, trialability, similarity, unpredictability and discernibleness. In the event that a Kenyan association watches the advantages of ERP frameworks, at that point, these advancements will be embraced when other essential apparatuses are accessible. This hypothesis will direct the examination on the effect of the ERP frameworks usage as a SaaS among SMEs inside the assembling segment.

2.1.2 The Technology Acceptance Model (TAM)

This model explains the manner in which customers grasp/recognize and use an advancement. TAM was founded in 1989 by Davis. This model attests that once a customer is given an elective development, a few angles impact their decisions on the methods and time of usage. This consolidates its clear comfort and seen supportiveness. TAM grasps settled causal chain of certifiable lead feelings, objective and mien. This was created by social clinicians from the theory of examined action. In Davis' examination, two fundamental parts are perceived; seen comfort and seen supportiveness (Davis, Pallister and Foxall, 2002).

TAM is broadly embraced and incredibly adds to the improvement of a forecast of a person's use of innovation (Fishbein and Ajzen, 2010). Seen usability impacts the apparent helpfulness and the expectation for appropriation (Davis, 1989). Notwithstanding TAM being a significant hotspot for hypothetical structure in the investigation of reception and utilization of innovation it has numerous impediments which incorporate the underlying reason planning the model which is stinginess and sweeping statement (Dishaw and Strong, 1999), not thinking about non-authoritative setting of the association (Davis and Venkatesh 2000), and disregarding the components which moderate the appropriation of ICT (Sun and Zhang, 2006).

This hypothesis has influenced investigate in acknowledgement of innovation. In this investigation, TAM will be used as a piece of three particular courses, explicitly to find how the usage of innovation improves various levelled organization movement to locals, how staff innovation readiness impacts the use of innovation in SMEs and how the openness of innovation impacts the use of mechanical development among SMEs. This hypothesis advises this investigation concerning the advantages that radiate from

the utilization of ERP as a SaaS that is the apparent helpfulness just as the difficulties experienced in the reception of ERP as a SaaS among the SME inside the assembling area that is the apparent usability.

2.2 Empirical Literature Review

This section discussed past studies according to the objectives of the study.

2.2.1 Organizational Factors Influencing Implementation of ERP as a SaaS

Despite the constant changes in the ERP system, its adoption has been on a downhill trend. As per Vilpola et al., (2011), the vast majority of the disappointments are because of its inconsistencies with business procedures. Past studies cite top administration support, training and change of plan by the management as the main aspects to consider when considering adoption of an ERP system (Li, 2011). Adjusting the ERP framework as a SaaS to the business forms inside the association has additionally been underlined in guaranteeing effective execution (Govindaraju, Salajar, and Chandra, 2015).

Musyimi and Okelo (2015) looked to decide factors that impact ERP selection among corporate individuals from the Kenya Association of Manufacturers (KAM) that work inside the Nairobi Metropolitan. Surveys were controlled to 141 KAM individuals while 17 ERP firms were met. Logit model was utilized to evaluate the impact of the variables on ERP appropriation. An authoritative composite factor was observed to be a significant factor, while the arranged change, business condition and ERP characteristics components were frail indicators of ERP selection (Musyimi and Okelo, 2015).

Venkatraman and Fahd (2016) portrayed a portion of the components that impact usage of ERP as a SAAS to incorporate cost adequacy, arrangement among programming and business forms, redid administration and preparing. Because of the dynamic idea of SME organizations, best practice rules for an SME's ERP as a SaaS execution could be landed at through nearer examination of its business necessities so as to stay away from Mavericks.

An investigation by Barasa (2018) tried to set up the institutional variables affecting the selection of Enterprise Resource Planning programming in the sugar business. The investigation utilized a spellbinding examination configuration was utilized for the

investigation. The objective populace comprised of 142 members chose through enumeration examining. Polls were utilized as instruments for information gathering. Information was broke down using a PC programming SPSS. The examination set up that quality control through re-arrangement of work forms, item institutionalization and vital course impacted the appropriation of ERP in Nzoia Sugar Company; it was additionally uncovered that work assignment through worker set of business abilities, quality work and the executive's authority and office format and data frameworks empowered the ERP selection.

An investigation by Malonza (2013) looked to decide the components deciding appropriation of ERP among recorded organizations in Kenya. The spellbinding exploration configuration was utilized in this examination. The example size was the fifty-six (56) organizations recorded at the NSE. The outcomes additionally have shown that the size of the firm, the number of representatives in associations, representative turnover, area of the sort of responsibility for the association, age of the company, capital structure and nature with ERP instruments affected associations appropriation of ERP frameworks.

2.2.2 Environmental Factors Influencing Implementation of ERP as a SaaS

Ecological elements are perceived as among the components impacting the appropriation of IT arrangements in the writing. For instance, the overall bit of leeway of embracing another innovation when contrasted and contenders (Low et al., 2011), weight from huge clients or potentially exchanging accomplices (Pan and Jang, 2008), weight from providers (Caldeira and Ward, 2002), and administrative weight and administrative prerequisites (Melville and Ramirez, 2008). Further, capacities and the notoriety of the SaaS seller positively affect the reception expectations of clients (Heart, 2009).

Government activities and strategies could specifically and in a roundabout way invigorate the improvement of IT framework and procurement of information to goad technology dissemination. SMEs are presented to a few related dangers inside the adoption and advancement of IT arrangements. It is critical to have a superior comprehension of its impacts and at last understand their requirement for it and

proportionate favourable circumstances of the framework for their business (Caldeira & Ward, 2013).

Lechesa, Seymour and Schuler (2012) explored the adoption of ERP SaaS in South Africa. The study determined that environmental factors were key determinates of use of ERP SaaS in South Africa. Network limitations and security concerns impacted adoption of ERP strongly.

ERPs are often seen as too rigid, and difficult to adapt to the specific workflow and business process of some companies - this is cited as one of the main causes of their failure. One of the failures is attributed to the fact that the functionalities of the system are intertwined such that one user's mistake affects the usage of the system of all the other users. Similarly, change of business operations due to changes in the business environment requires making changes on the functionality of the ERP system which proves expensive to businesses. Further, hesitation to exchange information between departments makes the system ineffective (Maditinos, Chatzoudes & Tsairidis, 2012).

2.2.3 Technological Factors Influencing Implementation of ERP as a SaaS

IT ability requirement is a factor in any IT reception choice and consequent use, and particularly so for SMEs. When all is said in done, utilizing its advantages/IS ventures is trying for SMEs given they're restricted specialized and human asset capacities (Ada, 2009). Another imperative as referred to by Zach and Munkvold (2011) is that ERP frameworks will, in general, be fairly exacting as they just grant a specific dimension of customization. Associations who demand to redo the application to suit business forms frequently report bombed execution.

Lechesa, Seymour and Schuler (2012) led an investigation on the appropriation of ERP SaaS in South Africa. Major factors repressing the reception of ERP SaaS were the costs of customisation and the possibility of customization. The SaaS model was seen to be unbending and not taking into account the adaptability required for frameworks, for example, ERP.

As indicated by an investigation by Malonza (2013), ERP traits that impact selection ERP frameworks are multifaceted nature of the ERP framework, similarity of ERP, trialability, Observability, significance of the ERP while expanded enthusiasm inside

organizations for the reception of the ERP frameworks prompted the appropriation of the framework, all things considered, among the organizations Malonza (2013).

Seethamraju (2014) led an investigation in to ascertain the adoption of ERP in Indian and Australian firms using the SaaS model. Various factors were common for the two nations. Factors considered in Australia included appropriate programming, level of customization conceivable, insufficiency of available data frameworks, and certainty of data security. On the other hand, the name and size of the company providing the software, quicker execution time, readiness of the SAAS seller to co-work with the client all through usage organize and the capacity to move capital use to work costs were a portion of the key determinants of the selection choice.

2.3 Research Gaps

From the writing audit, different research has been directed to recognize the different ERP execution systems. Be that as it may, very little has been referenced on the execution of the ERP frameworks particularly the Software as an administration ERP in Kenya. Concentrates that have dived the usage of ERP utilizing the SaaS model were not situated in Kenya. For example, Seethamraju (2014) examined Indian and Australian Firms on the usage of ERP as SaaS while Lechesa, Seymour and Schuler (2012) led an investigation on the execution of ERP SaaS in South Africa. Concentrates that are nearby centred around ERP reception as a rule without fundamentally taking a gander at the model of selection. For example, Muchina (2018) directed an examination on ERP appropriation and authoritative productivity, Balance Score Card Approach among Manufacturing SMEs in Kenya while an investigation by Musyimi and Okelo (2015) looked to discover the reception of ERP frameworks in Kenya: an instance of chosen assembling firms in Nairobi metropolitan.

2.4 Chapter Summary

ERPs are frequently connected with exposing business to risk, costly and introduce complexity to business operations. However, change in the way of conducting business operations with the advent of technological advancement ought to nullify this perception. While Manual frameworks of maintaining the business tasks give a great deal of solace to the clients, they are frequently baffled by mistakes simply like some other manual framework action would. Increased competition necessitates that business

earn high amount of income for them to survive (Rachidi and Mohajir, 2014). Being at par with the high levels of competition in the market calls for efficiency which requires use of systems such as ERP (Hudd, 2016).

On overall, the perception on use of ERP system is consistent regardless on the mode of use. What makes the difference is the perceived usefulness of the ERP system (Johansson & Ruivo, 2013). As noted by Johansson and Ruivo (2013), the perceived ease of use is what informs the decision of a user to either adopt ERP as SaaS or On-Premise. Hence, an ERP system provider should be conversant with the needs or requirements of a business (Johansson & Ruivo, 2013).

2.5 Conceptual Framework

The conceptual framework in figure 2.1 shows the relationship between the dependent variable and the independent variables.

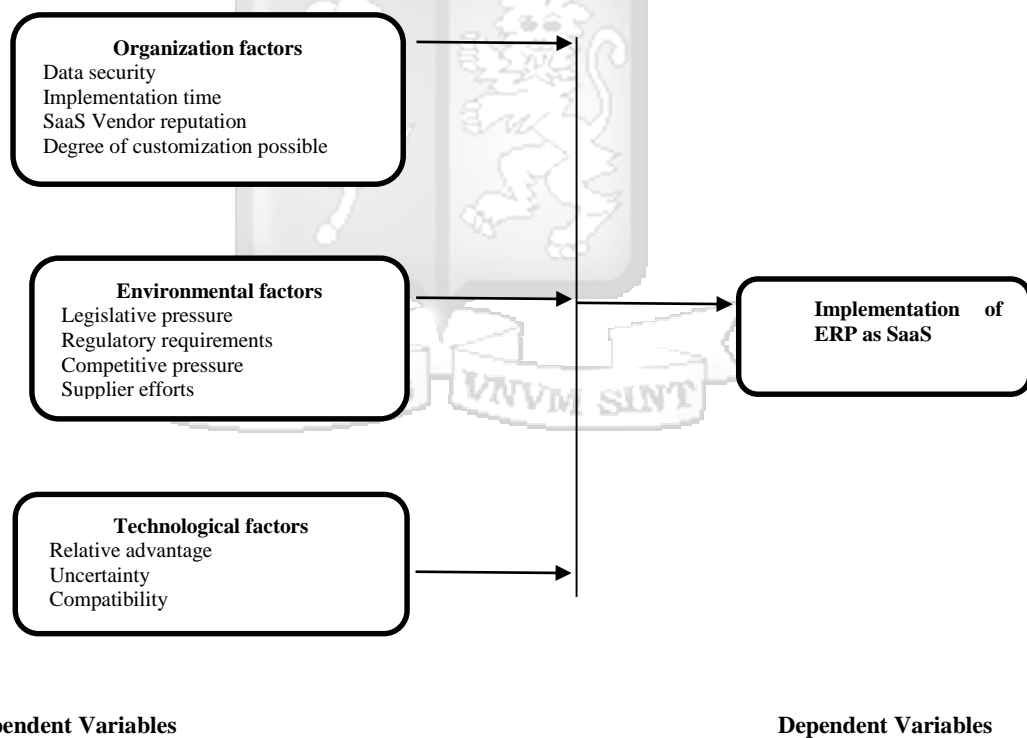


Figure 2.1: Conceptual Framework

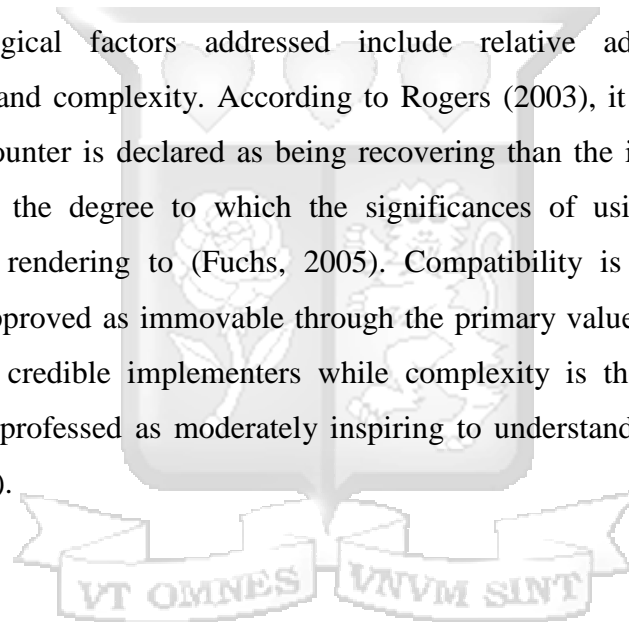
Source: The author (2019)

Organizational context is critical in regard to addressing the issues concerning adoption of innovation as noted by previous studies (Ramdani, 2008). The four critical issues that are addressed as far as organizational context is concerned include data security,

implementation time, SaaS vendor reputation, degree of customization possible and management support.

Some of the critical factors that are identified within the environmental scope include legislative pressure, regulatory requirements, competitive pressure and the efforts of the supplier as well as external computing support. Legislative pressure and regulatory requirements denote the expectation of the government and other regulatory institutions. Competitive pressure is the degree of heaviness felt by the stable after contestants inside the commerce while computing support denotes the dealer happenings that can expressively impact the likelihood that an invention will be implemented, (Oliveira & Martins, 2010).

The technological factors addressed include relative advantage, uncertainty, compatibility and complexity. According to Rogers (2003), it denotes the degree to which an encounter is declared as being recovering than the idea it displaces while uncertainty is the degree to which the significances of using an unearthing are apprehensive, rendering to (Fuchs, 2005). Compatibility is the degree to which detection is approved as immovable through the primary values, previous donations, and needs of credible implementers while complexity is the extent to which an origination is professed as moderately inspiring to understand and use rendering to (Rogers, 2003).



CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

The examination system in this section depicts the methodology that was taken to accomplish the investigation destinations. It depicts the examination configuration, ponder populace and study test size and inspecting system. The information accumulation apparatuses and strategies are additionally examined, notwithstanding the systems and factual methods that was used for the last investigation of the information created from this examination.

3.1 Research Design

Descriptive survey design was utilized in this study. Descriptive surveys describe the behaviour of the subject being studied. The study aimed to describe the impact of the implementation of ERP systems using the SaaS model among SMEs within the manufacturing sector in Nairobi, Kenya. Other studies related to this study that adopted descriptive survey research design include a study by Barasa (2018) who aimed at establishing the institutional factors influencing adoption of ERP software in the sugar industry, Malonza and Nzuki (2014) who sought to establish the determinants of adoption of ERP systems by Kenyan listed companies.

3.2 Target Population

The population consisted of all the SMEs within manufacturing industry in Nairobi, Kenya. This study targeted companies which are members of the Kenya Association of Manufacturing (KAM) based in Nairobi County. The number of SMEs that have registered with KAM is 134 (KAM, 2018).

3.3 Sample Size and Sampling Technique

Non-probability sampling technique was adopted for this study. Under non-probability sampling techniques, convenience sampling was adopted to choose only those SMEs in the manufacturing sector that have their operations in Nairobi. This study sampled all the 134 SMEs based in Nairobi County registered with KAM. The study then selected the ICT managers who were purposively selected to represent each SME. Thus, the sample size for this study was 134 respondents.

3.4 Data Collection Instruments

This study used primary data. The primary data was significant in expressing the actual scenario of the dependent and independent variables relationship. The data was obtained from the original sources using questionnaires. The use of questionnaire was justified because it provided a cheap, effective and efficient way of gathering information within a very short period. The questions were designed to be both open and close ended.

3.5 Data Collection Procedures

The polls were self-controlled. The surveys were controlled utilizing the drop and pick later technique and email strategy for those ICT supervisors who were inaccessible because of their bustling timetable. The surveys were appropriated to all respondents chose in the example. The inquiries were separated into two segments; the main area included the statistical data of the respondents while the last segment tended to the exploration inquiries of the investigation. The shut finished inquiries were as a five-point Likert scale. The scale gave respondents an alternative to express their suppositions on a size of 1 to 5.

3.6 Data Analysis

Data analysis entailed decluttering, refining, and organizing raw data. In this study, quantitative techniques were applied to summarize and scrutinize the data. The analyses were centred on the research questions as the main themes. The quantifiable data was analysed using SPSS version 23. The quantifiable data was coded, checked for errors, and then fed into the computer for analysis.

The quantitative analysis began by conducting descriptive statistics which consolidated the information in a significant manner permitting simpler examination of the information. There are various kinds of descriptive measurements that were utilized to draw bits of knowledge from information. These included frequencies, central tendency and percentages. The inferential insights were correlation and regression analysis. The Correlation values reveal the association between study variables. A multiple regression model is used to separate individual variable from the others giving individualistic coefficient that describe its relationship to dependent variable. Moreover, regression model explains the direction and magnitude of relationship

between the variables by use of coefficients for instance, coefficient of determination and level of significance.

3.7 Research Quality

Pilot study was conducted to establish reliability and validity of the questionnaire. In this study, questionnaire was tested on 10% of the sample which is equivalent to 14 respondents and this was done to guarantee its relevance and effectiveness. The subjects who participated in pilot study were not included in the final study and this helped in avoiding survey fatigue. The final sample size for the actual study remained to be 134.

3.7.1 Validity

The study utilized both build legitimacy and substance legitimacy. For build legitimacy, the poll was partitioned into a few areas to guarantee that each segment surveys data for a particular goal and guarantees that the equivalent intently binds to the calculated system for this investigation. To guarantee content legitimacy, the survey was exposed to intensive examination by the boss. They assessed the announcements in the survey for significance. In view of the assessment, the instrument was balanced properly before exposing it to the last information accumulation work out.

3.7.2 Reliability

Reliability refers to the extent at which results error free or degree at which instrument of research produces results that are consistent (Cooper & Schindler, 2014). This test was conducted to guarantee internal consistency of data measurement instrument. Cronbach alpha was adopted to confirm the reliability. This is because the Cronbach's Alpha enables the researcher to know if the instruments of research would avail reliable/ consistent answers even when questions are replaced with similar ones.

A variable is said to be stable if it produces a stable response from similar questions set. Cronbach's Alpha shows reliability by indicating a true score of the 'underlying' construct (Valencia-GO, 2015). Orodho (2003) defines construct as a wide topic of study or simply as a concept to be studied. The 'Alpha' value (true score) has values that range from 0 to 1. A high score is used to indicate high reliability, 0.7 being the accepted and adequate value of Alpha or reliability coefficient (Valencia-GO, 2015).

This study employed Cronbach Alpha as the test for reliability. All the study variables were reliable as they had a cronbach coefficient of 0.7 and above.

Table 3.1: Reliability

Variable	No of Items	α=Alpha	Comment
Implementation of ERP	7	0.704	Reliable
Organizational Factors	5	0.769	Reliable
Environmental Factors	6	0.714	Reliable
Technological Factors	5	0.876	Reliable

3.8 Ethical Issues in Research

According to Creswell (2013) it is important to be prepared for ethical issues that may emerge during the implementation of a study. According to Donald and Theresa (2013) ethics denote the conventions dictating treatment of research subjects. The aim of research ethics is to guarantee a safe environment for research participants during the research process (Cooper & Schindler, 2003). Before data collection, the a letter of authorization was obtained to proceed with the study from the postgraduate department at Strathmore University and acquired an introduction letter from the Ministry of Education. The permit to conduct research was sourced from NACOSTI.

The researcher then solicited for consent (Patton, 2012) of the participants to undertake the exercise. The research subjects were notified of their rights and liberties relating to their involvement in the study. Necessary consent forms were signed before the research. This was done to conform to the principle of voluntary consent (Cooper, 2009) by letting respondents to willingly take part in the exercise. While undertaking this study, the researcher took necessary precautions to guarantee confidentiality of the respondents and avoid misrepresentation of the findings.

After the data collection the researcher coded the questionnaires, respondents were given pseudonyms to observe confidentiality (Preece, 2013). The data was then properly analysed and presented without doctoring the results. All questionnaires were then stored safely in a lockable cabinet during and after the analysis.

Finally, the researcher as far as possible respected the intellectual property by avoiding plagiarism (Shamoo & Resnik, 2009). That means that all materials, which were used or referred to in this work were acknowledged accordingly. For credibility, materials

from the different books, journal articles, magazines, theses and dissertations were cited properly. The study was objective and devoid of bias or discrimination.



CHAPTER FOUR

PRESENTATION OF RESEARCH FINDINGS

4.1 Introduction

This section entailed analysis of data and research findings presentation. Results are displayed in form of diagrams, tables and continuous prose form. This study targeted

134 SMEs within the manufacturing sector in Nairobi, Kenya. The study made inquiry on respondents the demographic characteristics. The target respondents were ICT managers in these SMEs.

The study aimed at determining the connection between factors influencing implementation of ERP as a SaaS and Implementation of ERP as a SaaS. In addition, the study aimed at establishing the challenges faced when implementing ERP as a SaaS in SMEs within the manufacturing sector in Nairobi, Kenya. To analyse these variables, statements were drawn to enable establish how they related to each other. Inferential statistics was performed to indicate connection between independent and the dependent variables. These comprised regression analysis and correlation matrix. The regression results included model of fitness, ANOVA and regression coefficients.

4.2 Response Rate

This study targeted 134 SMEs' ICT managers in the manufacturing sector in Nairobi, Kenya. Of the 134 questionnaires, 120 were filled appropriately and handed in. The table below shows the response rate.

Table 4.1: Response Rate

Response	Frequency	Percent
Returned	120	89.55%
Unreturned	14	10.45%
Total	134	100%

Source: Author (2019)

The results in Table 4.1 demonstrate a questionnaire return rate of 89.55%. the fact that the return rate was above 50% justified the use of the data for analysis in this study (Babbie, 2010).

4.3 Demographic Characteristics

This study made inquiry on general information of the respondents. The respondent's information was with regard to gender, age, highest academic qualification, level of management and on number of years worked in their organizations.

4.3.1 Gender

The respondents were asked to indicate their respective genders.

Table 4.2: Gender

	Frequency	Percent	Valid Percent	Cumulative Percent
male	65	54.2	54.2	54.2
female	55	45.8	45.8	100.0
Total	120	100.0	100.0	

Source: Author (2019)

The findings in Table 4.2 affirmed that 54.2% were males while the rest (45.8%) were females. The results demonstrated that the workforce for SMEs in the manufacturing industry is male dominated.

4.3.2 Age

The study also sought to find out respondents' age.

Table 4.3: Age

	Frequency	Percent	Valid Percent
Less than 25 years	19	15.8	15.8
26-35 years	55	45.8	45.8
36- 45 years	42	35.0	35.0
Above 45 years	4	3.3	3.3

Total	120	100.0	100.0
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Source: Author (2019)

Results in Table 4.3 showed that 45.8% of respondents were aged between 26 and 35 years followed by them aged between 36 and 45 years at 35%. The third age bracket was of them that were less than 25 years old at 15.8%. Finally, the age bracket of them that were above 45 years at only 3.3%. The results indicate that most of the respondents were the youths. Consequently, the higher number of ICT managers aged between 36 and 45 years can be explained in that many of organizations would want to retain a workforce that is experienced, a phenomenal that majorly comes with age (Chung, Park, Cho, Park, Kim, Yang & Yang, 2015).

4.3.3 Education Level

The respondents were also tasked to show their highest academic qualification.

Table 4.4: Education Level

	Frequency	Percent	Valid Percent
Secondary	4	3.3	3.3
College	18	15.0	15.0
Graduate	51	42.5	42.5
Post Graduate	47	39.2	39.2
Total	120	100.0	100.0

Source: Author (2019)

Results indicated that 42.5% of the respondents were degree holders, followed by post graduates at 39.2%. The other category of level of education was college at 15%. Only 3.3% of the respondents indicated to have secondary level of education. The level of education usually has a bearing on respondents' opinion on implementation of ERP as a SaaS.

4.3.4 Level of Management

Respondents were tasked with the question on their level of management. Majority of them indicated that they were at the Middle level of management as shown by 56.7%. This category was then followed by them at the supervisory level at 27%. The least was

the category of top-level management at 15.8%. These results can be explained by the fact that the study's respondents were ICT managers implying that those in the supervisory level acted on behalf of the ICT managers who were not available to give their feedback. These results are as indicated in table 4.5 below.

Table 4.5: Level of Management

	Frequency	Percent	Valid Percent
Top level Management	19	15.8	15.8
Middle level Management	68	56.7	56.7
Supervisory	33	27.5	27.5
Total	120	100.0	100.0

Source: Author (2019)

4.3.5 Years Worked in Organization

The study implored the respondents on number of years they had worked in their respective organizations.

Table 4.6: Years Worked in Organization

	Frequency	Percent	Valid Percent
Below 1 year	10	8.3	8.3
2-5 years	48	40.0	40.0
6-8 years	43	35.8	35.8
More than 8 years	19	15.8	15.8
Total	120	100.0	100.0

Source: Author (2019)

The study established that majority of the ICT managers had served between 2 to 5 years, 40.0%. This category was followed by them that had served between 6 to 8 years at 35%. Thirdly, we had the category of them that had served for more than 8 years at 15.8% and finally them that had served for less than a year at 8.3%. This is an indicator that employee turnover at the SMEs. This also implies that the respondents had amassed a wealth of experience to possess the relevant information that this study is after.

4.4 Descriptive Statistics

Descriptive statistics were conducted on the factors influencing Implementation of ERP as a SaaS, Challenges faced when Implementing ERP as a SaaS and finally on Implementation of ERP as a SaaS

4.4.1 Environment Factors

Descriptive statistics were derived for the factor, environmental factors. The results are showed in Table 4.7.

Table 4.7: Environment Factors Descriptive Statistics

	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
Relative advantage of adopting a new technology when compared with competitors	0.0%	9.2%	10.8%	52.5%	27.5%
Pressure from large customers and/or trading partners	0.8%	12.5%	9.2%	60.8%	16.7%
Legislative pressure	0.0%	14.2%	0.0%	76.7%	9.2%
Regulatory requirements	0.8%	10.0%	11.7%	50.8%	26.7%
Pressure from suppliers	0.0%	9.3%	16.1%	47.5%	27.1%

Source: Author (2019)

Majority of respondents at 52.5% were in agreement that they had a relative advantage of adopting new technology in comparison to their competitors. 60.8% agreed that they face pressure from large customers.. 76.7% agreed that SMEs face legislative pressure. 50.8% indicated that there are regulatory requirements and finally 47.5% showed that

there was pressure from suppliers. This results show that environmental factors influenced the implementation of ERP systems as a SAAS among SMEs within the manufacturing sector.

4.4.2 Organization Factors

Descriptive statistics were derived for the factor, Organization Factors. The results are as indicated in Table 4.8.

Table 4.8: Organization Factors Descriptive Statistics

	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
Reputation of the SaaS vendor	1.67%	14.17%	10.83%	57.50%	15.83%
Degree of customization possible	0.00%	16.67%	8.33%	57.50%	17.50%
Data security	0.00%	3.33%	14.17%	58.33%	24.17%
Inadequacy of existing information systems	0.00%	11.67%	15.00%	63.33%	10.00%
Implementation time	0.00%	6.67%	15.83%	62.50%	15.00%
Willingness of vendor to offer support during the implementation process	3.33%	0.00%	3.33%	72.50%	20.83%

Source: Author (2019)

57.50% of the respondents indicated that reputation of the SaaS vendor was present in their organization. 57.50% of the respondents indicated that their organizations acquired the degree of customization possible. 58.33% of the respondents showed that their organization had maintained data security. In addition, 63.33% of the respondents indicated that inadequacy of existing information systems was experienced in their

organization. A further 62.50% affirmed that their organizations had implementation time. Finally 72.50% posited that there was willingness of vendor to offer support during the implementation process. This results show that organizational factors influenced the implementation of ERP systems as a SAAS among SMEs within the manufacturing sector.

4.4.3 Technological factors

Descriptive statistics were derived for the factor, Technological factors. The results are as presented in Table 4.9 below.

Table 4.9: Technological Factors Descriptive Statistics

	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree	Mean	Standard Deviation
Easiness to try out new information technologies	5.00%	15.00%	6.67%	41.67%	31.67%	3.80	1.19
Number of opportunities to try various types of SaaS applications	3.33%	15.00%	8.33%	51.67%	21.67%	3.73	1.07
ERPs fitting well into the company's work style	4.17%	6.67%	4.17%	51.67%	33.33%	4.03	1.01
ERPs might not perform well with the IT operations.	2.50%	14.17%	23.33%	38.33%	21.67%	3.63	1.05

Time taken to learn how to use the ERPs to make it worth the effort	1.67%	8.33%	6.67%	56.67%	26.67%	3.98	.91
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Source: Author (2019)

The results showed that 41.67% said that in their organizations, there was easiness to try out new information technologies. 51.67% indicated that there were opportunities to try various types of SaaS. 51.67% indicated ERPs were fitting well into the company's work style. 38.33% of the respondents indicated that ERPs might not perform well with the IT operations. 56.67% indicated that there was Time taken to know how to use the ERPs to measure the effort engaged. The results showed that technological factors influenced the implementation of ERP systems as a SAAS among SMEs within the manufacturing sector.

4.4.4 Challenges faced when Implementing ERP as a SaaS

Descriptive statistics were derived for the factor, Challenges faced when Implementing ERP as a SaaS. The results are presented in Table 4.10 below.

Table 4.10: Challenges faced when Implementing ERP as a SaaS

	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree	Mean	Standard Deviation
Financial constraints	1.67%	10.00%	4.17%	54.17%	30.00%	4.01	.95
IT capability constraint	3.33%	5.00%	10.00%	55.83%	25.83%	3.96	.93
Misfit of the business process and	1.67%	2.50%	20.00%	43.33%	32.50%	4.03	.88

the ERP System logic							
Resistance to change	.00%	5.00%	9.17%	59.17%	26.67%	4.08	.75
Failure to support cross organization design	.00%	10.83%	8.33%	55.83%	25.00%	3.95	.88

Source: Author (2019)

According to the results from the table above, 54.17% indicated that their organizations were faced by financial constraints. Secondly, 55.83% of the respondents showed that their organizations were faced with IT capability constraints. In addition, 43.33% showed that there was misfit of business processes and ERP System logic. Moreover, 59.17% of the respondents indicated that there was Resistance to change in their organizations. Finally, 55.83% indicated that there was failure to support cross organization design.

4.4.5 Implementation of ERP as a SaaS

Descriptive statistics were derived for the various benefits emanating from the implementation of ERP as a SaaS. The findings are as presented in Table 4.11 below.

Table 4.11: Implementation of ERP as a SaaS

	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
Efficient business processes	0.00%	0.00%	4.17%	62.50%	33.33%
Real-time access	0.00%	3.33%	10.83%	54.17%	31.67%
Visibility and accuracy of information	4.17%	0.00%	0.00%	41.67%	54.17%

Effective information management	0.00%	9.17%	3.33%	34.17%	53.33%
Improved customer and supplier relationships	0.00%	4.17%	15.00%	30.83%	50.00%
Business growth	1.67%	8.33%	4.17%	35.00%	50.83%
Cost reductions	0.00%	5.83%	7.50%	41.67%	45.00%

Source: Author (2019)

Results in table above reveals that 62.50% indicated that there was efficient business processes in their organizations. 54.17% indicated that in their organization there was real-time access. Further, 54.17% strongly agreed that Visibility and accuracy of information was present in their organizations. In addition, 53.33% indicated that there was effective information management. Moreover, 50.00% agreed that in their organizations, there were improved customer and supplier relationships. 50.83% indicated that their organizations had experienced business growth. Finally, 45.00% of the respondents indicated that their organizations had showed cost reductions.

4.5 Inferential Statistics

The section states the inferential statistics employed to determine the relationship between factors influencing implementation of ERP system as a Software as a Service among Small and Medium enterprises within the Manufacturing Industry, Nairobi County and implementation of ERP system. They included correlation and regression analysis. Some diagnostic statistics were also conducted as a precondition of running the regression analysis. The attributes constituting the various variables were summarized to create a whole variable. This was achieved by estimating the median value of all the attributes.

4.5.1 Correlation Analysis

Correlation analysis establishes whether there exists an association between two variables. The study used pearson correlation to analyze the level of association

between factors influencing implementation of ERP system and implementation of ERP system. A Confidence Interval of 95% was employed as it is the most utilized in social sciences. A two tailed test was utilized.

Table 4.12: Correlation Analysis

		Implementati on	Environme nt factors	Organizatio n factors	Technologic al factors
Implementati on	Pearson Correlatio n	1	.516**	.606**	.627**
	Sig. (2- tailed)		.000	.000	.000
	N	120	120	120	120
	Pearson Correlatio n	.516**	1	.142	.163
Environment factors	Sig. (2- tailed)	.000		.032	.045
	N	120	120	120	120
	Pearson Correlatio n	.606**	.142	1	.599**
Organization factors	Sig. (2- tailed)	.000	.032		.000
	N	120	120	120	120
	Pearson Correlatio n	.627**	.163	.599**	1
Technologica l factors	Sig. (2- tailed)	.000	.045	.000	
	N	120	120	120	120

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Author (2019)

The findings in Table 4.12 indicate that the components depicting factors influencing the implementation of ERP system; organization, environmental and technological factors are significantly positively correlated at the 5% significance level to implementation of ERP system.

The significant correlation at the 5% significant level between all the predictor variables and the fact that none exceeded a p value of 0.7 indicated absence of multi-collinearity. Multicollinearity refers to statistical phenomenon whereby there is an exact/ perfect relationship between independent variables. In case of such, it is hard to get reliable estimates of their individual coefficients. This thus results into conclusions that are incorrect for the relationship of outcome variable and independent variables. Hence, all predictor variables can be dropped and only one retained to conduct a bivariate regression analysis.

4.5.2 Regression Analysis

The variables of the study were analyzed using regression model. Implementation of ERP system was regressed against; Organization, environmental and technological factors. The regression analysis was undertaken at 5% significance level. The results are displayed below.

Table 4.13: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.799 ^a	.639	.630	.27968

a. Predictors: (Constant), technological factors, environment factors, organization factors

Source: Author (2019)

Table 4.13 illustrate that the R square was 0.639, a discovery that 63.9% of the deviations in implementation of ERP system are caused by the predictor variables included in the study. Other variables not included in the model justify for 36.1% of the variations in implementation of ERP system.

Table 4.14: Analysis of Variance

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	16.058	3	5.353	68.427	.000 ^b
Residual	9.074	116	.078		
Total	25.132	119			

a. Dependent Variable: implementation

b. Predictors: (Constant), technological factors, environment factors, organization factors

Source: Author (2019)

The null hypothesis stated that there is no significant relationship between independent variables in unison and ERP system implementation. The alternate hypothesis is that there is a significant relationship between independent variables in unison and ERP system implementation. The study findings exhibit a significance value of 0.000 which is less than the critical value of 0.05. Thus, null hypothesis is rejected, and alternate one adopted. Therefore, the overall model is significant to explain implementation of ERP system.

Table 4.15: Model Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
	(Constant)	.772	.260		
Environment factors	.354	.049	.410	7.241	.000
1 Organization factors	.303	.064	.332	4.751	.000
Technological factors	.241	.047	.361	5.158	.000

a. Dependent Variable: Implementation of ERP system

Source: Author (2019)

The regression equation below was thus estimated:

$$Y_i = 0.772 + 0.354X_1 + 0.303X_2 + 0.241X_3$$

Where;

Y_i = Implementation of ERP system

X_1 = Environment factors

X_2 = Organization factors

X_3 = Technological factors

The null hypothesis is that there is no significant relationship between each of the predictor variables and ERP system implementation as a SaaS. The alternate hypothesis is that there is a significant relationship between each of the predictor variables and implementation of ERP system as a SaaS.

Environment factors, organization factors and technological factors and ERP system implementation as a SaaS have significance values less than the critical value of 0.05. Thus, the null hypothesis is rejected and the alternate hypothesis adopted. Therefore, the variables have a significant relationship with implementation of ERP system at the 95% level of significance. They have positive effects as exhibited by the respective coefficients.





CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

The study sought to determine the factors influencing the implementation of ERP system as a Software as a Service among Small and Medium enterprises within the Manufacturing Industry in Nairobi County. The effect of each of the predictor variable on the response variable was also analysed in terms of strength and direction.

Discussion of Findings

Descriptive statistics indicated that organizational, environmental and technological factors influence implementation of ERP system as a Software as a Service among

Small and Medium enterprises within the Manufacturing Industry in Nairobi County. The test for multicollinearity using the correlation matrix in Table 4.12 indicates that there is no presence of multicollinearity; all the predictor variables are significantly correlated to each other at the 5% level of significance. This meant that this could have no interference with the study findings.

The findings of the study were supported by those of Hudd (2016) who posited that, currently, a firm with no ERP lacks some efficiency in comparison to its competitors. A firm's decision to implement one has a great impact on its performance.

The analysis of variance pointed out that the model developed is significant as evidenced by the significance value obtained when compared to critical value. This implies that the model is appropriate in predicting implementation of ERP system by utilizing environment factors, organization factors and technological factors selected for the study.

The findings of the study are in agreement with those of Seethamraju and Seethamraju, (2008) who posited that ERP systems are standardized off-the-shelf packages that, if SMEs implemented them, would bring benefits for instance, efficient business process, , information accuracy, real-time access and improved management of information.

In addition, current findings are in agreement with those of Makathimo, (2016) who argued that Cloud-based ERPs have become a game changer for a lot of organizations all over the world due to its many benefits. Cloud-based ERPs help organizations run their business better, improving efficiency, providing accuracy in reporting and improved customer and supplier relationships. The flexibility of access using the internet makes it easier for access of the systems by the users from wherever they are through the use of an internet enabled device

Moreover, the findings are supported by those of Bois (2010) who stipulated that it is advisable that SMEs in Nairobi adopt cloud computing as a paradigm that will add value to their business operations. For instance, cloud computing will increase SME's flexibility, scalability, and this will reduce its operation cost. Most importantly, cloud computing will enhance the company competitive advantage by enabling it to access sophisticated technologies that will improve its business operation in the global market.

In addition, these benefits will help SMEs attain business growth as they become more productive and innovative and this helps the organization focus on its core business.

Environment Factors

Descriptive statistics indicated that environmental factors have been utilized as factors influencing the implementation of ERP system as a Software as a Service among SMEs within manufacturing industry in Nairobi County.

Results revealed that environmental factors and implementation of ERP system had a positive relationship ($r=0.516$, $p=0.000$). The model of coefficients output displays that environmental factors positively influences implementation of ERP system. Thus, a unit implementation of environmental factors will lead to a 0.354 increase in implementation of ERP system.

The study findings concurred with those of Low *et al.*, (2011) who stipulated that environmental factors influence the adoption of IT solutions. Other scholars have also outlined the impact of environmental factors on ERP system implementation, for instance, suppliers pressure (Caldeira & Ward, 2002), pressure from trading partners and/or large customers (Pan & Jang, 2008), and legislative/ regulatory requirements (Melville & Ramirez, 2008).

Moreover, the findings were supported by those of Lechesa, Seymour and Schuler (2012) who explored the utilization of ERP SaaS in South Africa. Environmental factors were key in deciding on utilization or non-utilization of the ERP SaaS in South Africa with issues around the system constraints and the security issues unequivocally affecting potential reception.

Organization Factors

Descriptive statistics displayed in Table 4.8 indicated that organization factors have been utilized as factors influencing the implementation of ERP system as a Software as a Service among SMEs within the manufacturing industry in Nairobi County.

The results in Table 4.12 above, revealed that organization factors and implementation of ERP system system had a positive relationship ($r=0.606$, $p=0.000$). The model of coefficients output displays that organization factors positively influences

implementation of ERP system. Thus, a unit implementation of environmental factors will lead to a 0.303 increase in implementation of ERP system.

The findings were in agreement with those of Musyimi and Okelo (2015) looked to decide factors that impact ERP selection among corporate individuals from the Kenya Association of Manufacturers (KAM) that work inside the Nairobi Metropolitan. An authoritative composite factor was observed to be a significant factor, while the arranged change, business condition and ERP characteristics components were frail indicators of ERP selection. Further, the findings concurred with those of Heart (2009) who posited that organization attributes of the SaaS vendor affects adoption intentions of users positively.

Technological factors

Descriptive statistics displayed in Table 4.9 indicated that technological factors have been utilized as factors influencing the implementation of ERP system as a Software as a Service among SMEs within the manufacturing industry in Nairobi County. The results revealed that technological factors and implementation of ERP system system had a positive relationship ($r=0.627$, $p=0.000$).

The model of coefficients output displays that technological factors positively influenced implementation of ERP system. Thus, a unit implementation of technological factors will lead to a 0.241 increase in implementation of ERP system. The findings of this study were in agreement with those of Seethamraju (2015) who stipulated that technology helps the business quickly transform and improve their performance.

Challenges faced when Implementing ERP as a SaaS

Descriptive statistics were derived for the factor, challenges faced when Implementing ERP as a SaaS. According to the results from the table above, 54.17% indicated that their organizations were faced by financial constraints. Secondly, 55.83% of the respondents showed that their organizations were faced with IT capability constraints. In addition, 43.33% showed that there was misfit of the business processes and ERP System logic.

The study findings were in agreement with those of Gartner Research Circle survey (2013) that stipulated that it is notable that organizations' biggest challenge is maintaining its operations cost because feasible studies indicate that most SMEs spend a lot of money in implementing proper information technologies. Cloud-based ERPs seek to address this challenge as the implementation and operation costs are greatly reduced since the users are now paying for the service rather than infrastructure and software costs.

In addition, the findings concur with those of Lechesa, Seymour and Schuler (2012) who revealed that the major attributes that hinder adoption of ERP SaaS include the cost of subscription and maintenance. The SaaS model was seen as inflexible in providing ERP.

Conclusions

Descriptive statistics indicated that environmental factors have been utilized as factors influencing the implementation of ERP system as a Software as a Service among SMEs within manufacturing sector in Nairobi County. Results revealed that environmental factors and implementation of ERP system had a positive relationship ($r=0.516$, $p=0.000$). The model of coefficients output displays that environmental factors positively influenced ERP system implementation. Thus, a unit implementation of environmental factors will lead to a 0.354 increase in ERP system implementation.

Results showed that organization factors and ERP system implementation had a positive relationship ($r=0.606$, $p=0.000$). The model of coefficients output displays that organization factors positively influences ERP system implementation. Thus, a unit implementation of environmental factors will lead to a 0.303 increase in implementation of the ERP system.

This study concluded that technological factors and implementation of ERP system had a positive relationship ($r=0.627$, $p=0.000$). The model of coefficient output displays that technological factors positively influenced ERP system implementation. Thus, a unit implementation of technological factors will lead to a 0.241 increase in the implementation of the ERP system.

The study concluded that SMEs within manufacturing industry in Nairobi were faced by financial constraints. Secondly, 55.83% of the respondents showed that their organizations were faced with IT capability constraints. In addition, 43.33% showed that there was misfit of business processes and ERP System logic.

Recommendations

The study recommends continuous monitoring of factors influencing implementation of ERP system as a Software as a Service among Small and Medium enterprises within Manufacturing Industry, Nairobi County. This will ensure that of ERP systems implementation meets improved delivery of service needs in given firms.

It is documented that in Nairobi, the presence of very high state standard ICT offices is vital for growth of existing organizations, affecting the business premise location, making new occupation, and extending opportunities. The government should come in handy to give approaches and strategies aimed at advancing the appropriation of innovation among SMEs.

The ministry of industrialization and enterprises development must aim at improving skills and knowledge of employees to ensure boosted ERP implementation. This can be achieved via personnel trainings prior to the system going live and ensuring continuous post implementation training to fill in this knowledge gaps.

The top management should in addition offer leadership during implementation process and provide relevant support to project team.

Limitations of Study

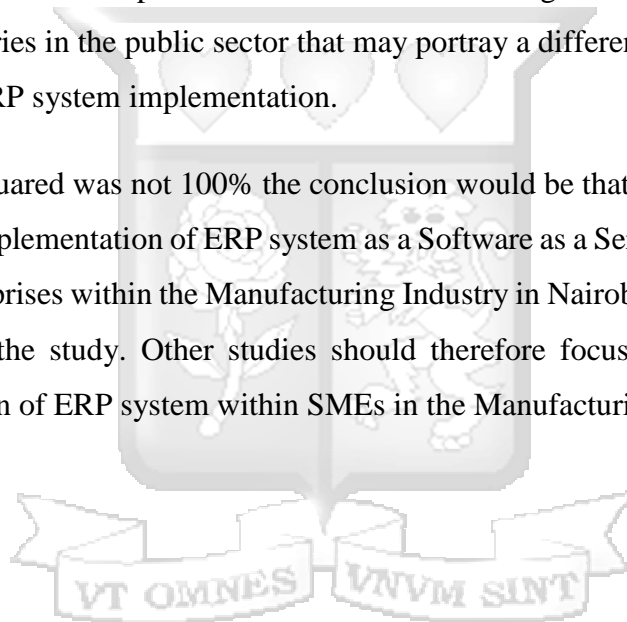
The analytical methodology for the study was scientific. Therefore, this study lacked qualitative information necessary in explaining soft and hidden parameters affecting the relationship between factors influencing ERP system implementation as a Software as a Service among Small and Medium enterprises within the Manufacturing sector, Nairobi County and ERP system implementation. Although this is important the design of the study was more quantitative than qualitative. Conducting an interview/ focus group discussion could have given qualitative information and hence collaborate these findings.

Areas for Further Study

The study suggests that future studies should also conduct a qualitative analysis of the relationship between factors influencing the implementation of ERP system as a Software as a Service among Small and Medium enterprises within the Manufacturing Industry in Nairobi County and implementation of ERP system. The study would involve interviews of key informants in the manufacturing SMSs and thus give hidden insights into this relationship.

Further research should be carried out to dig deep on the main challenges facing ERP system implementation in the public sector in Kenya. Although this study majored on Small and Medium enterprises within the Manufacturing sector, there are also other distinct industries in the public sector that may portray a different scenario/perspective in regard to ERP system implementation.

Since the R squared was not 100% the conclusion would be that there are other factors influencing implementation of ERP system as a Software as a Service among Small and Medium enterprises within the Manufacturing Industry in Nairobi County that were not addressed by the study. Other studies should therefore focus on other factors and implementation of ERP system within SMEs in the Manufacturing Industry in Nairobi County.





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Appendix I: Introduction Letter

Dear Sir/Madam,

My name is Lydia Njaaga. I am a post-graduate student from Strathmore University. I wish to conduct a research titled “*Factors influencing software as a service enterprise resource planning system implementation. case: small and medium enterprises in manufacturing industry in Nairobi County*”

A questionnaire has been developed to assist gathering relevant information for this study. I will ask you a few questions to assist in completion of this study. Whatever

information you shall provide will be strictly confidential and will not be shown to any other persons. Participation in the study is voluntary.

Many thanks for your acceptance with regards to participation in this study

Yours Faithfully,

Lydia Njaaga



Appendix II: Questionnaire

Kindly answer the following questions as honestly and accurately as possible. The information given will be treated with a lot of confidentiality. Please do not write your name anywhere on this questionnaire. You are eligible to give us your feedback if you are the household head.

Section A: Demographic Characteristics

1. Gender Male Female

2. What is your age?

Less than 25 years 26-35 years 36- 45years

Above 45 years []

3. What is your highest academic qualification?

Secondary [] College []

Graduate [] Post Graduate []

4. What is your level of management?

Top level Management []

Middle level Management []

Supervisory []

5. How many years have you worked in your organization?

Below 1 year [] 2-5 years []

6-8 years [] More than 8 years []

Section B: Factors influencing Implementation of ERP as a SaaS

Environment Factors	1	2	3	4	5
Relative advantage of adopting a new technology when compared with competitors.					
Pressure from large customers and/or trading partners					
Legislative pressure					
Regulatory requirements					
Pressure from suppliers					
Organization Factors					
Reputation of the SaaS vendor					

Degree of customization possible					
Data security					
Inadequacy of existing information systems					
Implementation time					
Willingness of vendor to offer support during the implementation process					
Technological factors					
Easiness to try out new information technologies					
Number of opportunities to try various types of SaaS applications					
ERPs fitting well into the company's work style					
ERPs might not perform well with the IT operations.					
Time taken to learn how to use the ERPs to make it worth the effort					

Section D: Challenges faced when Implementing ERP as a SaaS

6. Do you experience any challenges when making a decision to adopt or while using ERP system in your enterprise?

Yes [] No []

If Yes, indicate your agreement as to whether you experience the following challenges on a scale of 1 to 5, where 1=Strongly Disagree, 2=Disagree, 3=Unsure, 4=Agree and 5=Strongly Agree

Statement	1	2	3	4	5
Financial constraints					
IT capability constraint					
Misfit of the business process and the ERP System logic.					
Resistance to change					
Failure to support cross organization design					

Section C: Implementation of ERP as a SaaS

7. Does your enterprise use an ERP system to run its operations?

Yes No

8. If yes, what model does your enterprise use?

On-premise SaaS

9. If yes, how long has your enterprise used ERP system?

Less than 5 years 6-10 years Above 10 years

If Yes, indicate your level of agreement to the statements below on the implementation of ERP systems as a SaaS in your enterprise on a scale of 1-5 where: 5 Strongly Agree, 4 Agree, 3 Neutral, 2 Disagree, 1 Strongly Disagree.

Statement	1	2	3	4	5
Efficient business processes					
Real-time access					
Visibility and accuracy of information					
Effective information management					

Improved customer and supplier relationships					
Business growth					
Cost reductions					

THANK YOU FOR YOUR RESPONSES

