

**CLOUD COMPUTING VISION, INSTITUTIONAL
FORCES, ORGANIZATIONAL MINDFULNESS, CLOUD
ADOPTION AND PERFORMANCE OF SELECTED
FIRMS IN KENYA**

By

OREDO JOHN OTIENO

M.Sc. IT, Strathmore University – 2008

B.Ed, Moi University – 1998

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THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF
DOCTOR OF PHILOSOPHY IN BUSINESS ADMINISTRATION,
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JANUARY 2016

DECLARATION

I declare that this thesis is my own original work and it has not been submitted for examination to this or any other university.

Signature: -----

Date: -----

Oredo John Otieno

D80/60320/2010

This thesis has been submitted for examination with our approval as the university supervisors.

Signature: -----

Date: -----

Dr. James Njihia

Department of Management Science

School of Business

University of Nairobi

Signature: -----

Date: -----

Dr. X.N. Iraki

Department of Management Science

School of Business

University of Nairobi

DEDICATION

To my parents who worked tirelessly to ensure I get a decent education. To my wife Rispa, our children Garfield, Abigail and Joshua for the warmth at home.

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*“The whole of science is nothing more than an extension of
everyday thinking”*

ALBERT EINSTEIN

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P.o. Box 72214-00200

Nairobi.

John.oredo@gmail.com

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List of Abbreviations and Acronyms

Abbreviation	Abbreviation in Full
CBK	Central Bank of Kenya
CRM	Customer Relationship Management
ERP	Enterprise Resource Planning
FEDI	Federal Electronic Document Interchange
IaaS	Infrastructure as a Service
ICT	Information and Communication Technology
IRA	Insurance Regulatory Authority
IS	Information Systems
IT	Information Technology
ITaaS	Information Technology as a Service
KAM	Kenya Association of Manufacturers
OM	Organizational Mindfulness
OV	Organizing Vision
PaaS	Platform as a Service
SaaS	Software as a Service
SCM	Supply Chain Management
SEM	Structural Equation Modeling

ABSTRACT

The adoption of IT innovations has been a major area of research in information systems. The determinants of IT innovations are known to vary on the basis of the nature of the innovation and the context of adoption. While there is substantial literature on the adoption of various IT innovations based on utility computing, there is a dearth of empirical literature on cloud computing adoption by business organizations. Further, a majority of the empirical studies that have investigated cloud computing adoption by business organizations have done so in the context of developed countries. Given that cloud computing adoption has been steadily increasing in Kenya, the current study aims at investigating the determinants and antecedents of cloud computing adoption and the effect of cloud computing adoption on firm performance. To this end, the study adapted the socio-cognitive theories of organizing vision, institutional forces and organizational mindfulness to understand cloud computing adoption and its effect on firm performance. To achieve the overall goal of the study, hypotheses were formulated to test the relationship between cloud computing vision, institutional forces and organizational mindfulness on cloud computing adoption; between cloud computing adoption and firm performance; and the interaction effect of organizational mindfulness on all the relationships. The relationships and the interaction effects were specified in a SEM diagram comprising of measurement and structural models. A firm level cross sectional survey was conducted on selected firms within the financial, ICT and manufacturing sectors in Kenya. Of the 180 firms sampled, 93 completed the questionnaire resulting in a 51.6 percent response rate. The responses were then used to test the study hypotheses. Exploratory factor analysis was conducted to purify the data and partial least squares structural equation modeling used to evaluate the reliability and validity of both the measurement and structural models. The results indicate that institutional forces and organizational mindfulness have a significant positive relationship with cloud computing adoption. Cloud computing adoption was found to have a significant positive relationship with firm performance. The relationship between cloud computing vision and cloud computing adoption was found to be negative and insignificant. The results further showed that the interaction effect of organizational mindfulness on all the relationships was very low and insignificant. These research findings show that institutional forces and organizational mindfulness plays a leading role in determining organizations' adoption of cloud computing. More importantly, the results indicate that cloud computing adoption significantly improves firm performance. A major implication of this study is that community discourse on cloud computing needs to be enhanced to build a cloud computing vision as its effect on cloud computing adoption was found to be negative and insignificant. The government, universities, consultancy firms, professional bodies and industry associations should participate and facilitate cloud computing discourse. The findings of this study have theoretical and practical implications on the adoption and implementation of IT innovations. Additionally, the findings have implications on the formulation and implementation of IT innovations policy.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Cloud computing has been described as one of the technological shifts within the last decade (W. Wang, Rashid, & Chuang, 2011) enabling a massive transformation of the entire computing industry in the 21st century (“IDC Cloud,” 2013). An international study on key information technology and management issues ranked cloud computing 2nd, 3rd and 2nd in terms of top application and technology developments in 2011, 2012 and 2013 respectively (Luftman et al., 2012, 2013; Luftman & Zadeh, 2011). The rapid growth of cloud computing has seen worldwide revenue from public information technology (IT) cloud services exceeded \$21.5 billion in 2010 and will reach \$72.9 billion in 2015 (“IDC Cloud,” 2013). This rapid growth rate is over four times the projected growth for the worldwide IT market as a whole which stands at 6.7% (ibid). As a result, cloud computing has become a popular topic for blogging, white papers, workshops, conferences and even magazines (Armbrust et al., 2010) leading to a heightened interest by firms in cloud computing adoption (El-Gazzar, 2014).

Cloud computing cannot be sufficiently understood as a standalone phenomenon in the IT market, but rather as a core ingredient of a larger transformation of the IT industry since it impacts the entire IT ecosystem. Cloud computing therefore makes a compelling business case on both technical and commercial aspects (KPMG, 2011). The term cloud computing has been defined in different ways by industry analyst firms, academics, IT companies and standards bodies. A more generally accepted definition of cloud computing is that it is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (networks, servers, storage, applications and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction (Mell & Grance, 2011). Cloud computing therefore allows users to utilize computing resources over a network or internet as services without necessarily acquiring and owning them.

To enable organizations discern whether, when, and how to adopt (Fichman, 2004) cloud computing, they need to understand internal and external factors that have impact on cloud computing adoption processes (El-Gazzar, 2014). Studies that focus

on the technology characteristics and organizational factors as the main determinants of IT innovation adoption are generally considered to be taking the dominant paradigm approach (Fichman, 2004) while those that consider factors external to the organization as also important in understanding IT innovation adoption are broadly considered to be taking a socio-cognitive approach (P. Wang, 2009). Among the external factors impacting cloud computing adoption process are cloud computing vision and institutional forces. Internal factors like organizational mindfulness are also important in ensuring that cloud computing adoption leads to improved firm performance.

Most studies on IT innovation adoption have employed the dominant paradigm models at the individual and organizational levels. While these models have worked reasonably well (Fichman, 2004), they fail to step out of the focal organizations adopting an innovation to analyze the broader inter-organizational environment in which such organizations operate (P. Wang, 2009). Though it is an organizational effort to implement the materials and processes associated with an IT innovation, organizations increasingly rely on others in a broader environment to make sense of the IT innovation and to formulate the adoption decision (P. Wang, 2009). The role of inter-organizational factors in IT innovation adoption can be understood from the socio-cognitive perspective. The social-cognitive perspective embeds implicitly or explicitly the idea that an innovation not only takes place in the adopter organizations where it is materialized but also in a collective environment where the innovation is developed as a concept (P. Wang, 2009). The socio-cognitive theories informing this study are the organizing vision (Ramiller & Swanson, 2003) and institutional theory (DiMaggio & Powell, 1983). Because these socio-cognitive theories capture the notion of irrationality (El-Gazzar, 2014) and bandwagon behaviour (Abrahamson, 1991), the theory of mindfulness (Swanson & Ramiller, 2004) has been used to explain organizational cognition.

Although cloud computing has been widely adopted by the industry, research on cloud computing is still at an early stage (Zhang, Cheng, & Boutaba, 2010). While there is an impressive amount of technical literature on cloud computing in computer science (Marston, Li, Bandyopadhyay, Zhang, & Ghalsasi, 2011), cloud computing adoption processes have received less attention. Further, a majority of cloud

computing research have been conducted within the context of the developed economies (El-Gazzar, 2014). There is a need for exploring cloud computing adoption within the context of developing economies like Kenya. This will create an opportunity for transferring lessons from the developed world to the developing economies and vice versa.

1.1.1 Cloud Computing Vision

Cloud computing vision is a shared understanding of the organizational applications of cloud computing as established, maintained and transformed through a community discourse (Swanson & Ramiller, 1997). Understanding how a community of organizations interested in cloud computing makes sense of it is important for two reasons. First, except for its inventor, all the organizations learn about a new technology from outsiders such as competitors, suppliers, customers, consultants and the universities (P. Wang, 2009). Second, an increasing number of organizations are opting to outsource IT products and services through cloud computing and other outsourcing channels.

Cloud computing vision as a multidimensional construct captures the role of inter-organizational discourse in shaping the potential adopters' shared understanding of cloud computing and its applications. It helps community members interested in an innovation to interpret and legitimize the innovation (Cornford & Klecun, 2002). It further facilitates the mobilization of the community members in achieving the material realization of the innovation (Swanson & Ramiller, 1997). Cloud computing vision therefore, explains how a community's discourse about cloud computing shapes its interpretation, legitimation and mobilization. Once some of the community members adopt the innovation, other organizations within the same community may adopt the same innovation as a result of institutional forces.

1.1.2 Institutional Forces

The institutional forces are pressures on organizations to conform to certain shared notions of appropriate forms and behaviours, since violating them may call into question the organization's legitimacy and thus affect its ability to secure resources and social support (DiMaggio & Powell, 1983). As a result of these pressures, organizations tend to attain inter-organizational isomorphism since the various

organizations are suspended in a web of values, norms, beliefs, and taken for granted assumption that guide and constrain their actions over time (Mignerat & Rivard, 2009). The institutional forces or pressures are classified as mimetic, coercive and normative by DiMaggio and Powell (1983).

According to DiMaggio and Powell (1983), organizations model themselves after other organizations deemed to be successful when faced with a new and poorly understood technology as a result of mimetic pressures. Mimetic pressures may cause an organization to respond to uncertainty by mimicking the actions of other organizations (Liang, Saraf, Hu, & Xue, 2007a). Coercive pressures are defined as formal or informal pressures exerted on organizations by other organizations upon which they are dependent (DiMaggio & Powell, 1983). Coercive pressures stem from a variety of sources including resource dominant organizations, regulatory bodies and parent organizations (Teo, Wei, & Benbasat, 2003). The normative pressures occur primarily as a result of professionalization which is a collective struggle of members to define and establish an occupational autonomy (DiMaggio & Powell, 1983).

1.1.3 Organizational Mindfulness

Organizational mindfulness (OM) reflects an organization's flexibility and reliability in the enactment of organizational routines (McAvoy, Nagle, & Sammon, 2013). Mindfulness, at its roots is a psychological notion that reflects upon the cognitive qualities of the individual (Langer, 1989). But recently, the idea of mindfulness has been extended from individuals to organizations (Weick & Sutcliffe, 2001) in order to distinguish between automatic/mindless and conscious/mindful information processing (McAvoy et al., 2013). According to Weick et al (1999), there are five antecedents of OM: preoccupation with failure, commitment to resilience, reluctance to simplify interpretations, sensitivity to operations, and underspecification of structures.

Organizations engaged in preoccupation with failure are continuously concerned about failures even if they are rarely occurring (Dernbecher, Risius, & Beck, 2014). Mindfulness is also thought to result from a commitment to resilience which is about recovering from failure (Fiol & O'Connor, 2003). In the context of reluctance to simplify interpretations, mindful organizations reduce assumptions and establish

measures to increase sensing capabilities of their employees through hiring employees with non typical experience; and through job rotation and retraining (Weick et al., 1999). Sensitivity to operations, also known as situational awareness, refers to the integrated big picture of operations and it encompasses the cognition and comprehension of the current situation as well as its projection to the future (Dernbecher et al., 2014). Underspecification of structures or deference to expertise is an organization's ability to subordinate hierarchical rank to expertise and experience. It involves migrating a problem to the experts who are most capable of solving them, regardless of hierarchical levels (Weick et al., 1999).

1.1.4 Cloud Computing Adoption

Cloud computing adoption is the use of internet based technologies to conduct business (Armbrust et al., 2010). The major goal of cloud computing adoption is to reduce the cost of IT services while increasing processing throughput, reliability, availability and flexibility of business operations. Cloud computing adoption involves the use of any of the cloud computing service models by an organization. These service models include Software as a Service (SaaS), Platform as a Service (PaaS) and Infrastructure as a Service (IaaS). The adoption of cloud computing by an organization can be measured in terms of earliness, frequency and extent of adoption.

The earliness of adoption of an innovation is the relative earliness of adoption among a population of potential adopters (E. M. Rogers, 2003). Earliness of cloud computing adoption is conceptualized as the elapsed time since an organization adopted any of the cloud computing service models. The frequency of adoption or incidence of innovation adoption measures the number of innovation processes adopted by an organization within a particular period of time (Fichman, 1999). The extent of cloud computing adoption reflects the degree to which an organization has adopted cloud computing (ibid). The degree of adoption involves the various types of cloud services adopted and the business units that are already using cloud computing within an organization.

1.1.5 Firm Performance

Firm performance is a subset of organizational effectiveness that covers operational and financial outcomes (B. J. Santos & Brito, 2012). Firm performance has been used by previous studies as a proxy for measuring the quality of IT innovation adoption (Fichman, 2004). The quality of IT innovation adoption is the extent to which an organization has adopted the right innovation, at the right time, and in the right way (Haner, 2002). The direct impact of IT innovations on firm performance is observable when the innovation facilitates or supports current processes, routines, work policies or product/service offerings (Zand, 2010). These effects translate to lower variable costs of production and lower prices and subsequently to higher sales if demand is price-elastic. While from a stakeholder perspective firm performance includes financial performance, employee satisfaction and customer satisfaction (B. J. Santos & Brito, 2012), this study will use financial performance as a multidimensional indicator of firm performance.

Financial firm performance can be measured in terms of revenue growth, productivity growth, market share growth and profitability growth (Zand, 2010). There are generally two approaches to firm performance measurement namely, the objective measurements that tend to be quantitative and subjective measurements that tend to be qualitative and based on the perception of the respondents. While objective measures focus on results, subjective measures focus on the process or means by which end results are achieved (A. Cohen, 1993). Subjective measurement has been used in several studies and findings have shown little difference between it and objective measurements (Richard, Devinney, Yip, & Johnson, 2009a). The use of subjective performance in this study is due to a number of reasons. First, the sample collected for this study contained many privately owned firms for which accounting data on their performance are not accessible. Secondly, researchers express strong reservations about the use of objective performance data specifically research settings involving small- and medium-sized companies since the data is prone to managerial manipulation for corporate and personal tax reasons (Sapienza et al., 1988 cited in Liozu & Hinterhuber, 2013). Finally, earlier studies show that perceptual performance tends to be highly correlated with objective indicators. For example, Kumar et al. (2011) found a high correlation (0.8) between subjective and objective data on firm performance

1.1.6 Financial, ICT and Manufacturing Firms in Kenya

Business enterprises in an economy are usually classified according to industry. The financial, ICT and manufacturing are some of the industries in a typical economy. These industries have been selected for this study because they have been identified as the early adopters of cloud computing globally with an average of 7.24 cloud apps adopted per business unit compared to an average of 5.4 for all industries (TATA Consultancy Services, 2012). A study done in South Africa also indicates that the ICT sector was leading in cloud computing adoption at 54% followed by manufacturing sector at 47% and the financial sector at 33% (Trope, 2014).

The adoption of cloud computing in Kenya is still emerging. A cloud computing in Kenya report indicates that adoption of cloud computing is fairly recent with first adopters appearing in 2010 (Omwansa, Waema, & Omwenga, 2014). Since Kenya has been the finest in ICT innovation in Africa and home to multiple regional hubs including IBM's first African research lab and Google's first sub-Saharan African office (ICT Authority, 2014), it is well positioned for cloud computing adoption. The report by Omwansa et al. (2014) confirms this as it states that 90% of the respondents thought that the cloud services market is ready in Kenya. The report further states that 48% of small and medium enterprises in Kenya have adopted cloud computing with a further 28% planning to adopt in the near future. Enterprises and institutions in the financial, ICT and manufacturing sectors are expected to be amongst the 48% of the early adopters. In Kenya, the finance sector, has 44 banking and mortgage institutions; 9 microfinance institutions (Central Bank of Kenya, 2015); and 71 insurance companies (IRA, 2015). The ICT sector is the largest among the three with a total of 1,278 firms (CA, 2015). Lastly, there are 627 large scale manufacturing firms in Kenya (KAM, 2014).

1.2 Research Problem

The adoption and assimilation of IT innovation has been a key area of investigation within the information systems research community for the past two decades (Yang & Hsu, 2011). Many recent studies on IT innovation adoption have been conducted using two confronting models: the economic-rational and social construction models (Yang & Hsu, 2011). Economic-rationalistic models argue that decision makers adopt an innovation because of expected efficiency or returns (Fiol & O'Connor,

2003). The sociological perspective emphasizes the social embeddedness of technological innovation and the desire of organizations to appear legitimate to powerful constituents or various stakeholders (Fiol & O'Connor, 2003). Common across economic-rationalistic studies is the emphasis on organizations that are adopters of an innovation whereas social perspectives are concerned with the socio-cognitive factors and processes in the environment of the focal innovating organization (P. Wang, 2009). Lacking in the extant literature is a model that explains IT innovation adoption from both the organizational and socio-cognitive perspectives. Cloud computing, as one of the latest innovations in the IT industry has gained momentum and moved from something to note to something to adopt and will finally transform organizations (Willcocks, Whitley, & Venters, 2014, p. 1). Although cloud computing has been widely adopted by the industry in developed countries (Zhang et al., 2010), its adoption in Kenya is fairly recent with first adopters appearing in 2010 according to a report by Omwansa et al (2014). The report further underscored the role of Government and suppliers in facilitating cloud computing up take. While there is an impressive amount of literature on cloud computing adoption in the developed economies, there is still scarcity of literature on cloud computing adoption within the context of developing countries (El-Gazzar, 2014).

These are still early days for the cloud economy in developing countries. According to Kshetri (2010), the market for cloud computing in developing countries is small but expanding rapidly thus becoming attractive market for the cloud computing providers. Granted that cloud computing is increasingly becoming important in the delivery of public and private services government and businesses in developing countries like Kenya should actively seek to assess the relevance and potential of cloud computing for their particular contexts. Most of the literature that has considered cloud computing in developing countries have focused on emerging markets, particularly larger countries with large installed IT infrastructure (UNCTAD, 2013). There is however a need for more research into the experiences and attitudes on cloud computing in a different categories of developing economies including least developed countries like Kenya. Further, studies should pay attention to the diversity of businesses within the developing countries from financial, ICT, manufacturing and others.

Earlier research has argued that early adoption of a technological innovation is based on rationalized choice while later adoption is institutionalized in the form of an organizing vision of the innovation. For example, the results of a study by P.Wang (2009) showed that there is a positive link between an innovation's vision and innovation adoption in the early to mid phases of an innovation's life cycle. However other studies suggest that institutional process are engaged from the beginning of an IT innovation. According to Bikhchandani et al (1992), managers resort to an innovation's vision popularity to infer the utility of an innovation when faced with ambiguity and uncertainty about an it. While a study on the organizing vision of cloud computing in Taiwan addressed the institutionalization of cloud computing and how it impacts on cloud computing adoption (Yang & Hsu, 2011), Tona and Carlsson (2014), confirmed the role of organizing vision in motivating organizations to adopt mobile business intelligence (Mobile BI). More studies are still required to extend the generalizability of the role of organizing vision in IT innovation adoption, especially cloud computing.

The institutional approach to IT innovation adoption claims that organizations face pressures to conform to organizational practices and policies readily accepted as legitimate and rational means to attain organizational goal (Teo et al., 2003). A study by Teo et al (2003) used institutional theory to explain the intention to adopt Federal Electronic Document Interchange (FEDI) and concluded that institutional forces have a significant influence on organizational intention to adopt FEDI. Several other studies on the ERP deployment concluded that institutional forces play a role in IT innovation adoption (Benders, Batenburg, & van der Blonk, 2006; Liang et al., 2007a). A study on cloud computing adoption by South African firms showed that of all the institutional pressures, the mimetic pressure is more important compared to coercive and normative pressures in the adoption of cloud computing (Trope, 2014). In order to extend the institutional theory to IT innovations in general, there is a need to investigate its role on the adoption of emerging IT innovations like cloud computing.

In order to respond to the calls by Fichman (2004); and Swanson & Ramiller (2004) for IS researchers to go beyond the dominant paradigm and organizational mindfulness as a possible approach to explaining IT innovation adoption, several

studies have since used it as a theoretical lens. For example, Vidgen and Wang (2009) used collective mindfulness to explain a team's agility while Wolf, Beck, and Pahlke (2012a) studied how high reliability organizations use mindfulness to mitigate potentially negative consequences. Recently, a study on the role of mindfulness in mobile business intelligence (mobile BI) adoption established that the enthusiasm of the executive and users affect the decisions of a company to adopt mobile BI (Tona & Carlsson, 2014). While current studies have made tremendous contribution towards understanding IT innovation adoption from the organizational mindfulness perspective, more studies are required to extend organizational mindfulness research to cloud computing adoption as an emerging IT innovation.

The impact of IT innovation adoption on firm performance has spawned two streams of research on IT adoption. One stream focusing on the IT productivity paradox (Dos Santos, Peffers, & Mauer, 1993) and the other on positive impacts of IT innovation on firm performance (Brynjolfsson & Hitt, 1993). The studies on each stream of the IT innovation adoption and firm performance debate have used different IT innovations to study the relationship. Studies on enterprise systems adoption concluded that IT innovation adoption improved firm performance (Shin, 2006; Zand, 2010). A study on ERP implementation on operational performance of an organization indicated that the implementation of each ERP system module influences operational performance measures differently (Madapusi & D'Souza, 2012). The stream of research on IT innovation adoption influence on firm performance needs to be extended to cloud computing. Furthermore, given the mixed results, more studies are required to firmly establish the role of IT innovation on firm performance.

The pressure on organizations to adopt an IT innovation due to institutional forces is prevalent in the early stages of an innovation leads to bandwagon behaviours (Fiol & O'Connor, 2003). Organizations that adopt an innovation due to bandwagon dynamics can still chart a successful course of implementation which can result into improved firm performance (Swanson & Ramiller, 1997). Such organizations need to embody mindfulness during the implementation of the innovation to enable it reflect on its practical experience but also monitoring closely the further evolution of the innovation, its envisioned applications and its marketplace (Swanson & Ramiller, 1997). Fichman (2004) hypothesized that organizations that exhibit greater

organizational mindfulness will have positive firm performance for any given level of innovation. While some research effort has been directed towards empirically testing the hypothesis from a management perspective (Bayraktar & Ndubisi, 2014), more studies should test this hypothesis in the light of IT innovations in general and cloud computing in particular.

As noted by Lin and Chen (2012), the particularities of emerging complex IT innovations like cloud computing and the complexities of modern organizational environments are posing technical and organization challenges to firms intending to adopt such innovations. In order to address these challenges, the question that still remains to be answered is how organizational and socio-cognitive factors discussed above impact IT innovations adoption and the effect of such adoption on firm performance. To answer this question, this study will examine the role of cloud computing vision, institutional forces and organizational mindfulness in cloud computing adoption. Further, it examines the effect of cloud computing adoption on firm performance within the context of financial, ICT and manufacturing firms in Kenya.

1.3 Research Objectives

The overall objective of this study is to investigate the interplay amongst cloud computing vision, institutional forces, organizational mindfulness, cloud computing adoption and firm performance. In order to achieve this overall objective, the following specific objectives have been formulated.

- i) To examine the relationship between cloud computing vision and cloud computing adoption by financial, ICT and manufacturing firms in Kenya.
- ii) To examine the relationship between institutional forces and cloud computing adoption by financial, ICT and manufacturing firms in Kenya.
- iii) To establish the relationship between organizational mindfulness and cloud computing adoption by financial, ICT and manufacturing firms in Kenya
- iv) To establish the relationship between cloud computing adoption and firm performance of financial, ICT and manufacturing firms in Kenya
- v) To establish the relationship between organizational mindfulness and firm performance of financial, ICT and manufacturing firms in Kenya

- vi) To establish the moderating effect of organizational mindfulness on the relationship between cloud computing vision and cloud computing adoption.
- vii) To establish the moderating effect of organizational mindfulness on the relationship between institutional forces and cloud computing adoption.
- viii) To establish the moderating effect of organizational mindfulness on the relationship between cloud computing adoption and firm performance.

1.4 Value of the Study

Several studies on IT innovation adoption have relied on the dominant paradigm. The current study steps out of the dominant paradigm to investigate the role of socio-cognitive factors on IT innovation adoption. These socio-cognitive factors explain the “irrationalities” arising from the institutional contexts that surround organizational actors. In studies where institutional approaches have been used, they have not adopted cloud computing as the focal IT innovation. By integrating institutional forces, cloud computing vision and organizational mindfulness in a single model of IT innovation adoption, this study enriches the IT innovation adoption theoretical repertoire. Furthermore, the study is a response to the recent calls nudging IS researchers to look beyond the dominant paradigm in IT innovation adoption research.

With its innovative IT services delivery model, cloud computing has attracted increasing interest from enterprises since its inception. The interest has been due to the fact that cloud computing could add technical and strategic business value to enterprises. But organizations intending to adopt cloud computing are faced with the challenge of knowing when, how and the extent to which they can strategically adopt cloud computing. The study therefore has practical implications for technology vendors, mediating institutions and adopters. The results of this study will inform how technology vendors should work with government agencies, professional associations, standards bodies and potential adopters in order to facilitate adoption of cloud computing. Further, the study proposes to managers how they can use organizational cognition to make sense of cloud computing in a bid to inform adoption decisions.

Many of the studies in cloud computing adoption have been done within the context of developed countries. While these studies have provided rich insights on cloud computing, there is a need to explore cloud computing adoption within the context of

developing countries. Given that this study will be conducted in Kenya, it will provide insight on the dynamics of cloud computing adoption to local organizations and policy makers. The results of this study will spur the government and its agencies to put in place policy mechanisms necessary for smooth adoption of cloud computing. Such policy mechanisms could be in the areas of cyber security, information ethics, ICT infrastructure and the role of cloud service brokers.

1.5 Structure of the Thesis

This thesis is organized into six chapters. Chapter One introduces the thesis of the study by defining and outlining the indicators of cloud computing vision, institutional forces, cloud computing adoption, organizational mindfulness and firm performance which are the main constructs of the study. This is followed by a justification of why the firms in the financial, ICT and manufacturing sectors were chosen for this study. This chapter also discusses the research problem and the relevant research objectives for addressing the research problem. The chapter concludes by outlining the value of the study to the various consumers of information systems research output.

Chapter two provides a literature review of conceptual, empirical and theoretical literature. The main sources of the literature reviewed are the journals of information systems and journals within the disciplines neighbouring information systems. The first section of this chapter reviews literature on the cloud computing concept, advantages of cloud computing adoption and the challenges of cloud computing adoption to enterprises. A review of relevant studies on theories of IT innovation adoption within the dominant paradigm and the weakness of these theories then follows. The next section provides a review of the alternative theoretical approaches falling within the broad category of socio-cognitive theories. The theories reviewed within the socio-cognitive divide are the organizing vision, institutional theories and organizational mindfulness. A summary of the literature reviewed is then represented in the form of knowledge gaps and how the current study intends to address the identified knowledge gaps. Finally, a nomological net of the hypothesized relationships amongst the various theoretical constructs of the study is presented in the form of a conceptual framework.

In chapter three, the research methodology used to realize the objectives of the study

is presented. The chapter begins with a review of the various philosophical approaches in information systems research and then isolates the particular philosophy approach appropriate for the current study. Also included in chapter three are the study context, research domain, target respondents and the data collection process. The sections that follow describe the operationalization of variables, the data analysis process and the validations for both the measurement model and the structural models of the study. Chapter three concludes with a summary of the hypothesis testing and data analysis procedures.

Chapter four represents the findings of the pilot and actual study. The first section of the chapter contains the data collection process and a description of the various respondent characteristics. Discussed next is the reliability and validity tests for all the indicators of each of the study constructs. What then follows is the assessment and estimation of both the measurement (outer) model and the structural (inner) models. The last section of this chapter presents the results of hypothesis testing and a summary of the hypotheses supported and those that are not supported.

Chapter five presents a discussion of the finding of the study. In this chapter, each of the hypotheses is discussed in the light of the study findings. The interpretation of the findings is done in the light of extant literature that either support or differ with the study findings. Sections two to four discuss the findings with regard to the direct effect of cloud computing vision, institutional forces and organizational mindfulness on cloud computing adoption. Section five and six discuss the findings on the direct effect of cloud computing adoption and organizational mindfulness on firm performance. The last sections discuss the interaction effect of organizational mindfulness on the various relationships between the study constructs.

In chapter six, summary, conclusion and recommendations of the study are presented. The first section of the chapter distills the findings of the study in terms of the study objectives. The following section presents conclusion of the study. The next section presents the implications of the study. These include theoretical contribution, contribution to IS body of knowledge, contribution to policy formulation and implication to the management practice. The section concludes with the limitations of the study and avenues for further and future research.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

IT innovation adoption has been a key area of information systems research. The focal IT innovation in this study is cloud computing. The first part of this section discusses the concept of cloud computing, advantages of adopting cloud computing and the challenges of cloud computing adoption. The second part reviews the theories of IT innovation adoption from the dominant paradigm perspective. The weaknesses of the dominant paradigm in the light of radical innovations like cloud computing are then presented. A review of the socio-cognitive perspective as an alternative to the dominant paradigm in IT innovation adoption research then follows. Finally, key studies employing the various socio-cognitive approaches to IT innovation adoption are reviewed, knowledge gaps identified and a conceptual framework that will guide the study is then presented.

2.2 The Concept of Cloud Computing

The Concept of cloud computing and its disambiguation is still evolving. The term cloud computing has been defined in different ways by industry analyst firms, academics, IT companies and standards bodies. The definitions seem to favour specific interest of the various cloud computing stakeholders. The definitions of cloud computing by some of the industry analyst firms are; 1) standardized IT capability (service, software or infrastructure) delivered via internet technologies in pay-per-use self service way by Forrester (Lecznar & Patig, 2011); 2) Style of computing in which scalable and elastic IT-enabled capabilities are delivered as a service to external customers using internet technologies by Gartner (Daryl, Bittman, Austine, Cearley, & Smith, 2008); and 3) A model for enabling ubiquitous, convenient, on-demand access to a shared pool of configurable computing resources(e.g. networks, servers, storage, applications and services) that can be rapidly provisioned and released by KMPG (KPMG, 2011). These definitions have been proposed by Industry analyst firms and therefore they define cloud computing from the perspective of cloud computing service providers and consumers.

The definitions of cloud computing provided by academics tend to focus on the components of cloud computing and the relationship between the suppliers and

consumers of cloud services. For example, Venters and Whitley (2012) define cloud computing as a new computing paradigm that allows users to temporarily utilize computing infrastructure over the network, supplied as a service by a cloud provider at possibly one or more levels of abstraction. While Venters and Whitley abstracts the composition of a cloud environment in their definition, Buyya et al (2009) emphasizes the components of a cloud environment. The last definition of cloud computing considered is that of National Institute of Standards and Technology (NIST) - a standards body. It defines cloud computing as a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (networks, servers, storage, applications and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction (Mell & Grance, 2011). This is the definition of cloud computing that will be used in this study because NIST is a standards body whose definition of IT innovation concepts is generally accepted.

2.2.1 The Genesis of Cloud Computing

The history of Grids and the Cloud may be traced back to 1961 MIT centennial, when John McCarthy first exposed the idea of 'Utility Computing' and he predicted that it would become the basis of a new and important industry (Cafaro & Aloisio, 2011). The idea of computing as a utility became the driving force behind the development of the Internet in the 1960s. The genesis of the use of the term 'Cloud Computing' is not clear as different literatures quote different dates. According to Lijun Mei et al (2008), the term cloud computing was first formulated in 1997 but its promotion and adoption has been slow until 2007. Some authors consider the birth of cloud computing to have been marked by the introduction of Amazon Elastic Compute Cloud (EC2) as a fee based commercial product (Weiss, 2007).

The utilization of computing resources as service rather than products started with the distribution of Information Technology (IT) infrastructure. Outsourced IT infrastructure services like Infrastructure as a Service (IaaS) has been around since at least the 1980s delivered by telecommunication companies and major IT outsourcers (Owens, 2010). Hosted applications in the form of Platform as a Service (PaaS) and Software as a Service (SaaS) were in vogue in the 1990s in the form of Application Service Provision (ASP) (Owens, 2010). Examples of ASP include email services like

hotmail that emerged in the 1990s as a means of outsourcing applications as a service (Venters & Whitley, 2012).

Early ASPs failed due to insufficient bandwidth and computing power (Venters & Whitley, 2012); however the dot.com boom resulted in a large increase in global fiber optic networking dramatically reducing latency and costs (Hogendorn, 2011). The integration of various innovations gave birth to cloud computing. These innovations included grid computing, utility computing and virtualization of computer hardware resources, especially storage and computation power. The industrialization of IT infrastructure and the transfer of computing activities from individual PCs and private data centres to large external public data centres accessible over the internet became known as cloud computing (Venters & Whitley, 2012).

2.2.2 Cloud Computing Service Models

In the course of cloud computing development, different classifications have been developed to capture its service layers. These layers have been referred to as cloud service models (Sriram & Khajeh-Hosseini, 2010), cloud business models (Yang & Hsu, 2011; Zhang, Cheng, & Boutaba, 2010) and cloud architectural layer (Stanoevska-Slabeva & Wozniak, 2010). The earliest classification known as the SPI model (Ahson & Ilyas, 2011) stratified cloud services into software as a service (SaaS), platform as a service (PaaS) and infrastructure as a service (IaaS)(Yang & Hsu, 2011; Zhang et al., 2010). The UCSB-IBM cloud ontology classified the cloud into five layers (Ahson & Ilyas, 2011, p. 5). The first three layers are similar to the SPI model and the rest of the two layers are software kernel layer and the hardware/firmware layer. The more technical ontologies include Jackson's UCSB-IBM and Hoff's ontology (Ahson & Ilyas, 2011). Figure 2.1 shows the UCSB-IBM cloud computing ontology.

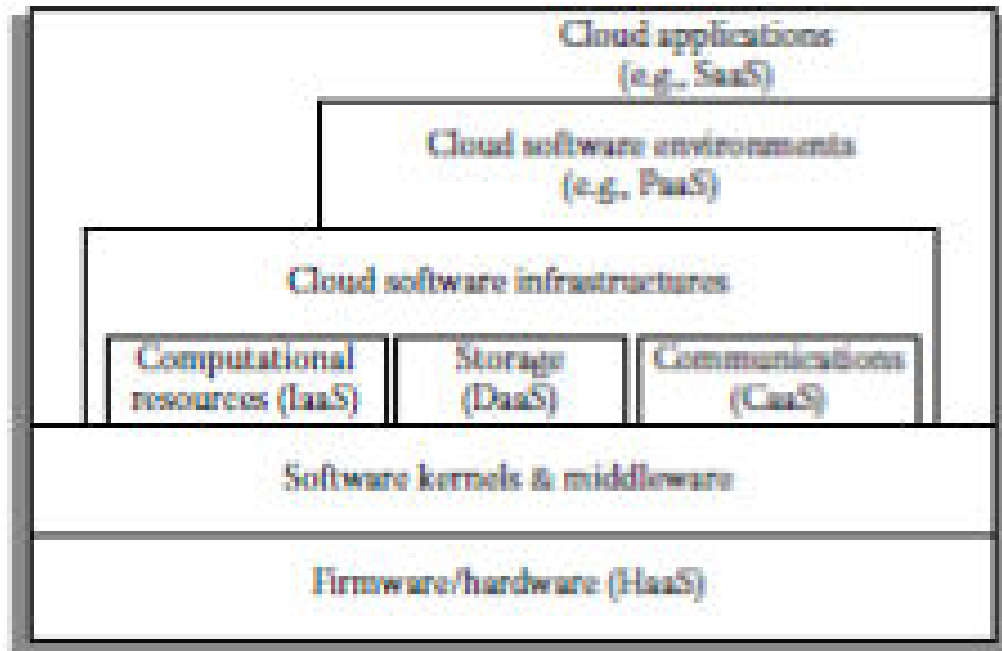


Figure 2.1: UCSB-IBM Cloud Computing Ontology

The SaaS layer provides applications that run on the cloud eliminating the need to install and run the applications on the client computer (Marston et al., 2011). SaaS is a software that is owned, delivered and managed remotely by one or more providers and offered on a pay-per-use mode (Stanoevska-Slabeva & Wozniak, 2010). PaaS facilitates the development and deployment of applications by providing operating system support and software development frameworks. This eliminates the cost and complexity of managing the underlying hardware and software layers. PaaS is a cloud service targeting developers. IaaS comprise computing resources like computational power (processors) and data servers that can be virtualized and instances provided as a service.

2.2.3 Cloud Computing Deployment Models

The cloud computing deployment models can be classified based on three features. These are physical location and distribution (Buyya, Goscinski, & Broberg, 2011); and the owner of the cloud data centre (Ristol, 2010). In this sense, a cloud can be classified as private, public or hybrid (Buyya et al., 2011). Figure 2.2 below summarizes the various cloud deployment models. The cloud deployment models are

service-agnostic, implying that each service model can be deployed as private, public or hybrid cloud.

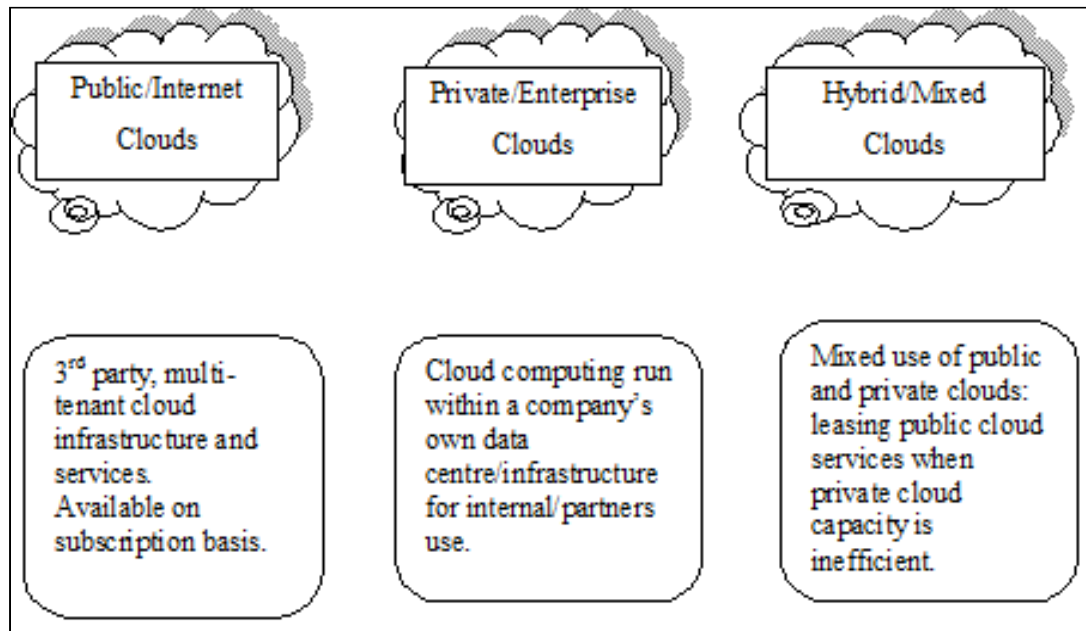


Figure 2.2: Cloud Computing Deployment Models (Ristol, 2010)

2.2.4 Cloud Computing Consumption Models

Cloud computing offers a unique way to consume computation, network, storage and software resources. At the most fundamental level, cloud computing provides flexible real time access to a shared pool of computing resources like networks, servers, storage, applications and services (Oltsik, 2010). The provision of ITaaS made available by cloud computing is possible due to some characteristics of cloud computing. The characteristics of cloud computing are: 1) On-demand self services where a consumer can unilaterally provision computing capabilities without the provider's intervention; 2) Broad network access which provides capabilities over the internet for different users and services; 3) resource pooling by the service provider to be used on a need basis by the consumers; and 4) a measured service which consumers are billed just like electricity consumption. Figure 2.2 below summarizes the cloud computing concepts.

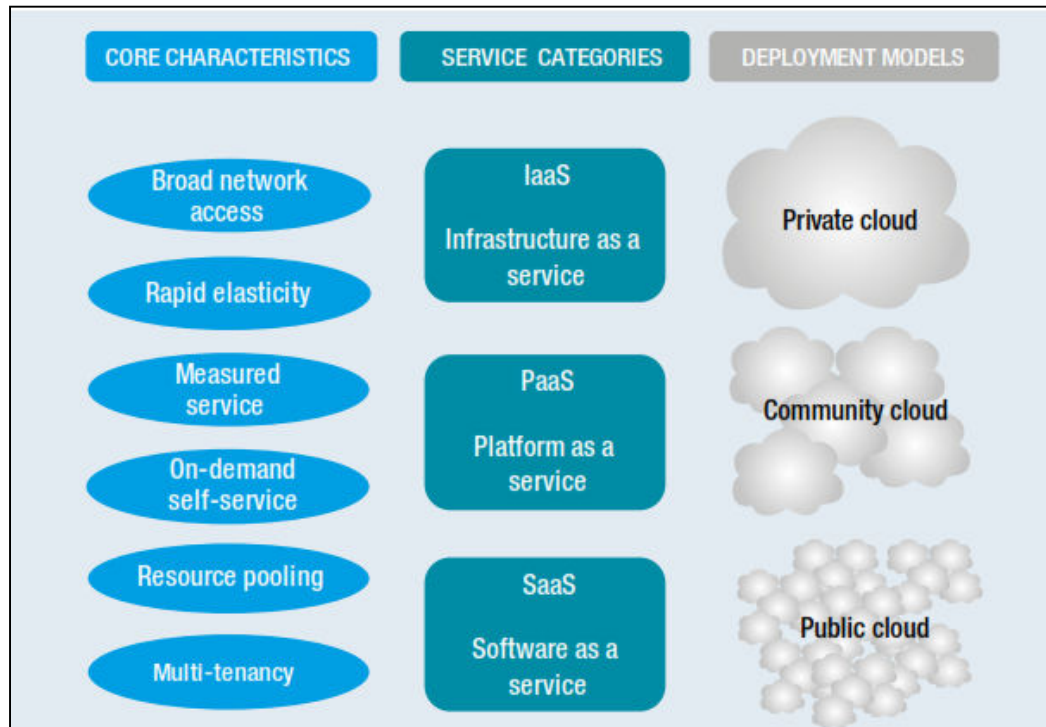


Figure 2.3: Cloud Computing Concepts (UNCTAD, 2013)

2.2.5 The Benefits of Cloud Computing Adoption

There are several compelling reasons for organizations to move operations toward cloud computing. Adoption of cloud computing requires very minimal upfront investment. Public cloud computing needs no capital expenditure because no hardware, software or network devices are purchased by the client (Mather, Kumaraswamy, & Latif, 2009). With the flexibility that cloud computing offer, organizations can acquire computing and development services as needed on demand on a pay-per-use basis. This is possible because cloud computing resources can be rapidly allocated and de-allocated on demand (Zhang et al., 2010) thus lowering operating costs.

Scalability of cloud computing allows organizations to demand computing resources and services on need basis. This is possible because infrastructure providers pool large amount of resources that are easily accessible depending on individual demand. Services hosted in the cloud are generally web-based and therefore, easily accessible through a variety of devices with internet connections (Zhang et al., 2010). Finally, cloud computing reduces business risks and maintenance expenses as these tasks are

passed on to the cloud service provider (Zhang et al., 2010). The cloud service providers are often equipped with the right skills and equipment, making them also enjoy economies of large scale.

2.2.6 The Challenges of Cloud Computing Adoption

There are several concerns users have with regard to the adoption of cloud computing. These challenges are seen as the main inhibitors to cloud adoption by organizations. Challenges or limitations of cloud computing are of technical, managerial and regulatory nature. Technical challenges include: 1) problems of availability/reliability of cloud services and the measures to be taken when something goes wrong in the system or its components (Kim, 2009; Buyya et al., 2011; ERNST & YOUNG, 2011), 2) lack of sufficient tools for integration/ Componentization of the various elements of the cloud (Mather et al., 2009, p. 230; Stanoevska-Slabeva & Wozniak, 2010), 3) limited scope for customization so as to suit the specific needs of an organization (Stanoevska-Slabeva & Wozniak, 2010; KPMG, 2011).

Managerial challenges to cloud computing arise from the fact that an organization has to deal with many service and infrastructure vendors. This may create a problem of how to effectively and efficiently manage security and privacy of an organization's data (Kim, 2009; Buyya, Goscinski, & Broberg, 2011). The provision of infrastructure and services by a vendor raises the fear of vendor lock-in (Kim, 2009; Mather et al., 2009, p. 228). Effective vendor management in order to get reliable services and prevent lock-in is become a challenge to many organizations (Ernst & Young, 2011). Cloud users may face organizational inertia as shifting to a Cloud environment may change the role of IT departments in the organization, and the way operations are carried out in general. Organizations must therefore also focus on change management for successful adoption (KPMG, 2011). Cloud computing creates a situation where service providers and the consumers may not be within the same legal or regulatory jurisdiction. This situation is problematic currently due to compliance/regulatory ambiguity(Ernst & Young, 2011; Kim, 2009; KPMG, 2011). These challenges can be mitigated by understanding the determinants and antecedents of IT innovation through extant theoretical lenses and proposing new theories in cases where the innovation is not yet fully understood.

2.3 Theories of IT Innovation Adoption

IT innovation is an innovation in digital and communications technologies and their applications (Swanson, 1994). Basically, IT innovations expands IT support of existing organizational tasks and generates new tasks or business processes (Carlo, Lyytinen, & Rose, 2011). Many recent studies on IT innovation adoption have used the economic-rational and social-cognitive models (P. Wang, 2009) as theoretical lens. The economic-rational models have been labeled “the dominant paradigm” (Fichman, 2004).

2.3.1 The Dominant Paradigm

Theories in the dominant paradigm are typified by the desire to explain IT innovation using economic-rationalistic models. Under the dominant paradigm, it is assumed that organizations exhibiting an innovator’s profile and therefore the “Right Stuff” will exhibit a greater quantity of innovation (Fichman, 2004). Organizations exhibiting an innovator’s profile are those that are larger, more diverse, have greater technical expertise and possess supportive senior management. These organizations are considered by the dominant paradigm as being able to adopt innovations often, adopt them early and adopt them thoroughly (Fichman, 2001). The main theories in the dominant paradigm are Diffusion of Innovation (DOI) (E. M. Rogers, 1995), Technology Acceptance Model (TAM) (Davis, 1989), and Technology-Organization-Environment (TOE) (Tornatzky, Fleischer, & Chakrabarti, 1990).

The Diffusion of Innovation Theory (DOI), also known as the Innovation Diffusion Theory (IDT) is based on the seminal work of Everett Rogers (1983). According to Rogers, the rate of adoption of innovation is impacted by five factors: relative advantage, compatibility, triability, observability and complexity. DOI being a life cycle model, explains change in reference to the sequence of phases through which the system of interest passes (Ven & Poole, 1995). DOI and its associated five key attributes have been drawn on extensively in IS literature to explain innovation implementation success or adoption. Roger’s DOI has been criticized mainly from three angles. It has been criticized, just like all the life cycle theories for not revealing the underlying mechanisms that generate the observed behavior (Fidock & Carroll, 2010). Furthermore, most of the studies employing DOI have done so from a cross-sectional or factor based research thus ignoring the process-oriented nature of

innovation diffusion (Fidock & Carroll, 2010). The theory has also been judged as being poorly equipped to facilitate understanding of how different groups interact in the production and provision of an innovation (Abu-Khadra & Ziadat, 2012). Nevertheless, DOI is one of the most widely used rational theories and there is a general agreement among researchers that it is a suitable and a valid theory for examining the process of adoption (Golding, Donaldson, Tennant, & Black, 2008). Following DOI in an attempt to explain and predict user adoption of technology is the Technology Acceptance Model (TAM) by Davis (1989).

The origins of TAM can be traced to the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975). TAM evolved from TRA with the goal of explaining the determinants of computer acceptance that is general, and capable of explaining user behavior across end-user computing technologies (Bradley, 2012). The two key variables in TAM perceived usefulness (PU) and perceived ease of use (PEOU). The theoretical support for the use of PU and PEOU can be found in self-efficacy theory, the cost-benefit paradigm, and the adoption of innovation literature (Bradley, 2012). While TAM is referred to as the most influential and commonly employed theory in IS (Y. Lee, Kozar, & Larsen, 2003), it has some weaknesses. Lee et al (2003) found out that the major limitation of TAM studies is self reportage. The studies did not measure actual usage but relied on the research subject to indicate usage. Furthermore, most of the studies used a single IS system in each research project limiting the generalizability of the results to other types of systems (Bradley, 2012). These limitations raise serious questions about the utility of TAM and related models like Unified Theory of Acceptance and Use of Technology (UTAUT) for understanding the life cycle of use and it is for these reasons and others that there have been widespread calls to go beyond TAM (Benbasat & Barki, 2007; Fidock & Carroll, 2010) and to consider the influence of an organization's environment in making IT innovation adoption decisions. One of the theories that emerged to address the role played by an organization's environment in IT innovation adoption is Technology-Organization-Environment (TOE) theory.

The Technology- Organization - Environment (TOE) was created by Tomatzky and Fleischer to study the adoption of technological innovations (Abu-Khadra & Ziadat, 2012). They believed that the process by which a firm adopts and implements

technological innovations is influenced by the technological context, the organizational context and the environmental context. The technological construct describes both the technologies in use and the new technologies relevant to the firm. The organization construct refers to the descriptive measures about the organization characteristics and resources such as scope, size, degree of centralization, degree of formalization, managerial structures, human resources, amount of slack resources and linkage among employees. The environmental construct refers to the arena in which a firm conducts its business – its industry, competitors, the macroeconomic context and the regulatory environment. It has been found that TOE is appropriate for studying contextual factors that influence e-business assimilation and it can be used for studying different innovations (Abu-Khadra & Ziadat, 2012). TOE has been used to study adoption of new technologies (for example, C.-P. Lee & Shim, 2007; Henriksen, 2006; (Pan & Jang, 2008). But still needed in the literature is the extension of the application of TOE to cloud computing adoption research.

The dominant paradigm approaches have dominated IT innovation research in the past two decades (Benbasat & Barki, 2007). While these models have worked reasonably well (Fichman, 2004), their linear discourse has been criticized as “over-rationalized” and fails to provide plausible explanations for the institutional and technical complexities of modern organizational environments (Abrahamson, 1991). Furthermore, they are seen as being pro-innovation; privileges the new over the taken for granted and adoption over rejection (Fidock & Carroll, 2010). Given that the dominant paradigm’s theories focus on the organization as the unit of analysis makes them too limiting. Coupled with the fact that the paradigm have accomplished high predictability, Fichman (2004) concluded that the paradigm itself “may be reaching the point of diminishing returns” and that IT innovation research should go beyond the organizational boundaries. In order to step out of the organizational boundaries in IT innovation research, Fichman (2004, p. 315) and P. Wang (2009, p. 4) proposed the socio-cognitive approach as a possible avenue.

2.3.2 The Socio-cognitive Perspective

Recently, there have been calls for IS researchers to be innovative and conduct research that go beyond the dominant paradigm (Fichman, 2004). Furthermore, there is need to theorize the IT artifact (Orlikowski & Iacono, 2001) as a multilevel product

of local and trans-organizational forces acting in concert (Swanson & Ramiller, 2004). In an attempt to understand the role of trans-organizational forces in IT innovation adoption, researchers have relied on socio-cognitive theories (P. Wang, 2009). The main socio-cognitive theories include; institutional theory (Meyer & Rowan, 1977), power and trust (Hart & Saunders, 1997); organizing vision (Currie, 2004a; Swanson & Ramiller, 1997), management fashion (P. Wang & Ramiller, 2004) and innovation concept (P. Wang, 2009). This study steps out of the dominant paradigm to engage organizing vision, institutional theory and organizational mindfulness to explain IT innovation adoption.

2.3.2.1 The Organizing Vision

An organizing vision is a focal community idea for applying information technologies in organizations (Swanson & Ramiller, 1997). According to Swanson and Ramiller, an organizing vision represents the shared understanding of the organizational application of IT innovations that are established, maintained and transformed through community discourse. Unlike IS innovations that take up material resources, organizing visions, essentially mental images or ideas, are produced and sustained through a discourse in an inter-organizational community often composed of technology vendors, consultants, journalists, (potential) adopters, and academics, all united by a common interest in shaping the vision (P. Wang, 2001). The discourse is promulgated amongst stakeholders through outlets like the newspapers, magazines, books, whitepapers, professional forums, speeches and advertisements.

The major theoretical arguments and empirical findings demonstrate that IT innovation is not only an organizational endeavour but also a community undertaking beyond organizational boundaries (P. Wang, 2009). The organizing vision manifests itself in the development of an IT innovation vision, which is a community's idea of the interpretation and utilization of the innovation (P. Wang, 2009). The popularity of an innovation's vision renders legitimacy to those adopting the innovation (Staw & Epstein, 2000). According to Bikhchandani et al (1992), managers resort to innovation vision popularity to infer the utility of an innovation when faced with ambiguity and uncertainty about it. According to P. Wang (2001) organizing visions shape the diffusion of IT innovations in three ways. First, a vision interprets the innovation's nature and purpose. Second, the vision develops the underlying rational

to legitimate the innovation as a good organizational practice attuned to business needs. Third, the vision helps mobilize the entrepreneurial and market forces to support the material realization of the innovation.

In order for organizations within a similar institutional framework to adopt an IT innovation, they have to collectively develop an organizing vision in order to make sense of the innovation. The organizing vision's functions of interpretation, legitimation and mobilization combined shape how an IT innovation will be adopted and diffused. This shaping process begins with a social account- an interpretation- of the potential application of an IT innovation in the organization (Lawrence & Rodriguez, 2012). An organizing vision is not a static vision but one that keeps on changing. New contributors to the vision interpret and produce discourse based on the previous interpretations (Ramiller & Swanson, 2003). Once an organizing vision has been propagated and widely accepted, it takes on "rule like status" (Swanson & Ramiller, 1997). The discourse arising from the interpretation of an IT innovation within the organizing vision is then used to attempt to legitimize it by linking it with contemporary business issues and established practices.

Legitimation of an IT innovation is a process when the rationale for adopting the innovation is being built and when questions of why it should be adopted are being addressed (Cornford & Klecun, 2002). According to Tolbert and Zucker (1983) legitimation of an innovation is achieved by grounding it into broader business concerns and demonstrating its relevance to prominent organizational needs. Legitimacy can also be bolstered by affiliating the practice with the reputation of social actors who promote and adopt it (Kaganer, Pawlowski, & Wiley-Patton, 2010). According to Yang and Hsu (2011) legitimation gives managers reasons to adopt an IT innovation based on broader business considerations and the innovation's value.

The final aspect of organizing vision, mobilization, entails all activities leading to activating, motivating and structuring the entrepreneurial, institutional and market forces that emerge to support the material realization of an innovation (Cornford & Klecun, 2002). According to Swanson and Ramiller (1997), mobilization helps motivate, activate and structure the actions of entrepreneurs to establish the necessary infrastructure and amass resources required "for making the innovation a reality and putting it into practice". The three functions of the organizing vision are

interdependent on each other. While interpretation is closely related to the cognitive aspects of legitimation, mobilization is mutually interdependent on legitimation efficacy (Fradley, Troshani, Rampersad, & Ionno, 2012). Furthermore, the manner in which these functions interact determines if an emerging IT innovation will become important and embedded and finally emerging and diffusing in the broader community or it will dissipate and become discredited or forgotten (Swanson & Ramiller, 1997).

2.3.2.2 The Institutional Theory

An institution is a social structure that is made up of a collection of individuals or organizations within which collectives exercise action or orientations in a constrained environment that will continuously be altered over time (Meyer and Rowan, 1977 cited in Weerakkody, Dwivedi, & Irani, 2009). The institutional theory posits that structural and behavioural changes in organizations are determined less by competition and the desire for efficiency, and more by the need of organizational legitimacy (Liang et al., 2007a). According to Teo et al., (2003), organizations face pressures to conform to organizational practices and policies readily accepted as legitimate and rational means to attain organizational goals. The institutional perspective has been used by various researchers to explain why certain organizational structures and ideals endure, and to study the internal and external influences on organizational patterns (Weerakkody et al., 2009). Institutional forces is one of the processes examined by the institutional theory (Japperson, cited in Mignerat and Rivard, 2009). Institutions exert three kinds of institutional pressures on organizations and organizational actors: mimetic, coercive, and normative pressures (DiMaggio & Powell, 1983).

According to DiMaggio and Powell (1983), mimetic pressures may cause an organization to change over time to become more like other organizations in its environment. Mimetic pressures often appear at times of uncertainty, when firms will tend to model themselves on other organizations in their fields that are perceived to be more legitimate or successful (DiMaggio & Powell, 1983). It is possible for an organization to mimic or imitate the actions and behaviours of other structurally similar organizations in the environment where the organization exists (Trope, 2014). Several factors contribute to mimetic behaviour by organizations. First, organizations

may manifest mimetic behaviours in order to model themselves after other organizations in a bid to acquire status-conferring legitimacy or social fitness in a wider social structure (DiMaggio & Powell, 1983). The urge for legitimacy may lead an organization to adopt an IT innovation regardless of its technical or economic efficiency. The second factor that contributes to mimetic behaviour is uncertainty. In cases where the uncertainty of returns from a managerial initiative is ambiguous and difficult to quantify, whether this initiative is an IT innovation or administrative change, an organisation may simply model itself on other organisations since it is easier and less costly to just pursue imitation (Ravichandran, Han, & Hasan, 2009).

Coercive pressures are defined as a formal or informal pressures exerted on organizations by other organizations upon which they are dependent (DiMaggio & Powell, 1983). Empirical evidence suggest that coercive pressures on organizations may stem from a variety of sources including suppliers, customers, resource dominant organizations, regulatory bodies, and parent corporations and are built into exchange relationships (Teo et al., 2003). A dominant actor that controls scarce and important resources may demand that organizations dependent on it adopt structures or programs that serve its interests and the resourced dependent organizations tend to apply in order to secure their own survival (Pfeffer and Salancik, 1978 cited in Teo et al., 2003). It has been shown that coercive pressures have significance in the adoption of innovations in the form of institutionalized interdependency. Institutionalized interdependency is manifested across organizations within an industry or environment since such organizations are likely to exhibit similar structural features (Liang, Saraf, Hu, & Xue, 2007b). Furthermore, organizations that share the same environment tend to take on similar forms as efficiency-seeking organizations seek the optimal 'fit' with their environment (Mignerat & Rivard, 2009)

Lastly, normative pressures are brought about by professionalization resulting from inter-organizational networks, similar educational backgrounds and mimetic behaviours in a profession (DiMaggio & Powell, 1983). Relying on social contagion literature, Burt (Burt, 1987), contends that a focal organization with direct or indirect ties with other organizations that have adopted an innovation is able to learn about that innovation and its associated benefits and costs, and is likely to be persuaded to behave similarly. The inter-organizational learning that leads to normative pressures

happens through relational channels amongst members of a network which further facilitates consensus which in turn increases the strength of these norms and their potential influence on organizational behaviour (Powell & DiMaggio, 1991). Normative pressures are known to arise from dyadic relations which enable focal organizations with direct or indirect ties to other organizations to learn from them through the sharing of information, norms and rules (Soares-Aguiar & Palmados-Reis, 2008). In the context of IT innovation adoption, the normative pressures that an organization faces regarding the adoption of cloud computing are heightened when cloud computing has been adopted amongst its suppliers, customers and by its participation in professional, trade or business organizations that endorse the adoption of cloud computing (Trope, 2014).

2.3.2.3 The Organizational Mindfulness

Adoption of IT innovations based on organizing vision and institutional theory are bandwagon behaviours. Bandwagons are diffusion processes whereby individuals or an organization adopt an idea, technique, technology or a product because of pressures caused by the number of organizations that have already adopted it (Fiol & O'Connor, 2003). In bandwagon behavior, adopting organizations entertain scant reasoning for their moves, notwithstanding the high cost and apparent risk involved (Swanson & Ramiller, 2004). In order to address the challenge of bandwagon behavior, IS researchers have begun to consider the theory of mindfulness and the role it plays in determining organizational innovation, particularly in the context of technologies subject to bandwagon dynamics (Fichman, 2004). Mindful organizations continuously scrutinize existing expectations and refine them according to new experiences in order to be able to invent new expectations for dealing with unprecedented situations to improve foresight and current functioning (Weick & Sutcliffe, 2001). Weick and Sutcliffe go further to state aspects of organizational mindfulness as: (1) preoccupation with failure, (2) reluctance to simplify, (3) attention to operations, (4) commitment to resilience, and (5) migration of decision to expertise.

The first aspect of organizational mindfulness is preoccupation with failure. A preoccupation with failure focuses the organization on converting errors and failures into grounds for improvement, often by treating failures and near failures as indicators of the overall health of the entire system (Butler & Gray, 2006). Apart from treating

failures as indicators of the overall health of the system, effective organizations also conduct thorough analysis of near failures (Weick & Sutcliffe, 2001). In the context of cloud computing, services are vulnerable to outages and security and therefore organizations adopting cloud computing must continuously monitor any failure or outage of cloud services. Further, they must also monitor any variation in service quality as a way of determining the overall health of the organization since it relies on services provided by third party cloud service providers (CSPs). All the personnel in the organization should be encouraged to report even small variations in the services provided and significant organizational effort should be expended to review them (Weick & Sutcliffe, 2001). Each aspect of availability should be carefully considered when engaging with a CSP, negotiated as part of the service level agreement (SLA) and tested in failover drills (Mather et al., 2009). Generally, the process of any IT innovation (like cloud computing) is itself prone to failure, and reflective attention to possibilities for failure in this domain also enlarges mindfulness (Swanson & Ramiller, 2004).

Reluctance to simplify interpretation refers to a collective desire to continually see problems in different perspectives (Butler & Gray, 2006). The mindful organization resists the temptation to settle into simplified and reproducible heuristics in its interpretation of events (Swanson & Ramiller, 2004). A mindful organization realizes that complex responses are needed in complex environments (Weick, 1995 cited in Swanson & Ramiller, 2004). Such a reluctance to simplify interpretations applies to organizations operating in a cloud environment in several ways. Cloud computing itself is a complex innovation with several service, deployment and consumption models (Zhang et al., 2010). Managing the interaction amongst these various service, deployment and consumption models pose a technological and contractual challenge for organizations (Marston et al., 2011). Reluctance to simplify interpretations therefore enables an organization to understand these challenges and problems from different perspectives. This increases the organization's chances of noticing and reacting appropriately to small anomalies and errors which reduces the likelihood of larger disastrous failures (Swanson & Ramiller, 2004).

Sensitivity to operations implies that some individuals in the organization have developed an integrated overall picture of operations in the moment (Butler & Gray,

2006). The mindful organization attends vigilantly to small and seemingly insignificant details in day to day operations (Swanson & Ramiller, 2004). This is because catastrophes usually accumulate from minor errors and random events. Organizations adopting cloud computing have cited lack of standards as a major concern (Marston et al., 2011). In the absence of standards, organizations must pay keen attention to every process since they cannot easily be automated. In the traditional setting, the main stakeholders are the providers and the consumers. Cloud computing adds new range of stakeholders, for example, regulators and enablers. This kind of setup requires personnel who understand how all these stakeholders interact in the cloud ecosystem.

A commitment to resilience refers to the tendency to cope with dangers and problems as they arise through error detection and error containment (Butler & Gray, 2006). This approach is in contrast to anticipation- a case where organizations deal with surprises by weeding them out in advance (Weick et al., 1999). Anticipation is achieved through planning and design of contingency plans for every possible unfavourable outcome. Commitment to resilience takes recognition that anticipation through planning and contingency measures is always incomplete. Resilience favours improvisation over planning, adaptation over routine, and effectiveness over efficiency (Swanson & Ramiller, 2004). In the context of cloud computing, commitment to resilience is likely to assume a significant role in ensuring reliability in the entire cloud ecosystem. The cloud environment is vulnerable to domino effects. The domino effects are due to the fact that the cloud ecosystem comprises a network of devices, services and organizations. These networks must be orchestrated so as to provide user services transparently. An interruption in any of the networks will cascade to the rest of the cloud ecosystem. Cloud adoption challenges like security (Buyya et al., 2011; Kim, 2009) and availability (Buyya et al., 2011; Ernst & Young, 2011; Kim, 2009) are joined at the hip. A security problem like denial of service attack (DOS) will lead to data unavailability. This interrelationship of various networks in a cloud environment leads to uncertainty and unpredictability of possible challenges that may arise in a cloud ecosystem. Business disaster and recovery in a cloud environment should focus on managing the unexpected. Managing the unexpected require that organizational business continuity strategies create a context and culture in which individuals and organizational units are better able to practice

resilience and reliability in the face of unexpected events (Butler & Gray, 2006).

Underspecification of structures is another indicator of organizational mindfulness. In this attribute of mindfulness, hierarchical rank is subordinated to expertise and experience. It involves migrating a problem to the experts who are most capable of solving them, regardless of hierarchical levels (Weick et al., 1999). Underspecification of structure can further be viewed as the readiness to relax formal structure so that authority for action can flow in times of crisis to the individuals and the units having the requisite expertise to deal with the problem at hand (Swanson & Ramiller, 2004). Cloud computing is a diverse phenomenon with several challenges including but not limited to security and privacy, vendor lock-in, regulatory ambiguity (Kim, 2009), integration, customization (Stanoevska-Slabeva & Wozniak, 2010), cultural resistance and transition (KPMG, 2011). The expertise needed to address these challenges will naturally reside in different individuals and units of the organization. This implies that the requisite expertise is heterogeneous and dispersed, and that the authority for action must flow readily to different units within the organization. When an outage of service arises in a cloud environment, those affected will turn to others in an effort to understand what the anomaly means. This turn is a subtle loosening of hierarchy in favour of expertise (Weick & Sutcliffe, 2001).

2.4 Empirical Literature on IT Innovation Adoption

Several studies have been conducted on IT innovation adoption and its related constructs both in the context of the dominant paradigm and the socio-cognitive perspective. This section provides a review of empirical studies on IT innovations adoption and the relationship between the various IT innovation adoption constructs relevant to the study objectives. The existing knowledge gaps in the empirical literature are identified and then relevant propositions stated to indicate the expected hypotheses.

2.4.1 Cloud Computing Vision and Cloud Computing Adoption

Cloud computing vision is a community's idea of the development and utilization of cloud computing. The popularity of an innovation's vision renders legitimacy to those adopting the innovation (Staw & Epstein, 2000) as it helps in the interpretation, legitimation and mobilization of the innovation. According to Bikhchandani et al

(1992), managers resort to an innovation's vision popularity to infer the utility of an innovation when faced with ambiguity and uncertainty about an it. Extant empirical literature shows that managers were willing to adopt web server products mentioned more frequently in the trade press (Gallaughner & Wang, 2002). Given that some IT innovations whose associated visions had been popular became institutionalized as indispensable (Fichman, 2004), managers may expect current popular innovations to have the same effect.

Further studies indicate that there is a positive link between an innovation's vision and innovation adoption in the early to mid phases of an innovation's life cycle (P. Wang, 2009). A study on the organizing vision of cloud computing in Taiwan addressed the institutionalization of cloud computing and how it impacts on cloud computing adoption (Yang & Hsu, 2011). In a study to investigate the role of organizing vision on the adoption of reverse e-auctions the authors concluded that although an organizing vision is often viewed as a force for adopting technology it can also be limiting force that inhibits organizations from obtaining significant benefits from technological opportunities (Standing, Standing, Love, & Gengatharen, 2013).

Recently, Tona and Carlsson (2014), confirmed the role of organizing vision in motivating organizations to adopt mobile business intelligence (Mobile BI). The results of the study show that organizing vision does have a considerable impact on the early phases of the decision making process to adopt Mobile BI. A study on the adoption of cloud computing adoption by Danish municipalities' concluded that institutional processes in the form of organizing vision played an essential part in the early and late diffusion of IT innovations and in the creation and evolution of an organizing vision for a system such as Opus (cloud based platform) for Danish municipalities (Frisenvang & Pedersen, 2014). Missing in these studies is the role of cloud computing vision in the adoption of cloud computing by business organizations within the context of a developing country like Kenya. In order to extend the application of the concept of the organizing vision in IT innovation, this study explores the role of cloud computing vision in the adoption of cloud computing by firms in Kenya. Hence the proposition:

Proposition 1: Positive cloud computing vision will determine cloud computing

adoption by firms in Kenya.

2.4.2 Institutional Forces and Cloud Computing Adoption

Institutional theory posits that organizations face pressures to conform to organizational practices and policies readily accepted as legitimate and rational means to attain organizational goal (Teo et al., 2003). Under the pressure of mimetic, coercive and normative forces, organizations implement strategies in order to gain, maintain or repair their legitimacy (Suchman, 1995a). Interactive innovations like cloud computing diffuse when other organizations observe and imitate the early adopters to replicate their success or avoid being perceived as laggards; or when they communicate with these early adopters and are persuaded, induced or coerced to adopt (Contractor and Eisenberg, 1990 cited in Teo et al., 2003).

A number of studies have used institutional theory to explain and predict adoption of IT innovations. Teo et al (2003) used institutional theory to study intention to adopt Federal Electronic Document Interchange (FEDI) and concluded that institutional forces have a significant influence on organizational intention to adopt FEDI. A study by Benders, Batenberg and Blonk (2006) on ERP deployment concluded that competitive and institutional pressures play a role in ERP adoption. Another study conducted on assimilation of enterprise systems also concluded that institutional pressures contribute to post implementation of ERP (Liang et al., 2007a). Recently, a study on cloud computing adoption by South African firms showed that the mimetic pressure is more important compared to coercive and normative pressures in the adoption of cloud computing (Trope, 2014). These studies show that IT innovations are embedded in complex interdependent social, political and economic networks that are shaped by broader institutional forces. Lacking substantial attention in the institutional perspective is the role of institutional forces in cloud computing adoption. From the empirical studies above, it is highly possible that the decision by potential cloud computing adopters to adopt cloud computing may be impacted by the various institutional forces leading to the proposition:

Proposition 2: Greater institutional forces will lead to cloud computing adoption by firms in Kenya.

2.4.3 Organizational Mindfulness and Cloud Computing Adoption

Adoption of IT innovations based on cloud computing vision and institutional forces are bandwagon behaviours. Bandwagons are diffusion processes whereby individuals or organizations adopt an idea, technique, technology or a product because of pressures caused by the number of organizations that have already adopted it (Fiol & O'Connor, 2003). In bandwagon behavior, adopting organizations entertain scant reasoning for their moves, notwithstanding the high cost and apparent risk involved (Swanson & Ramiller, 2004). In order to address the challenge of bandwagon behavior, the role of organizational mindfulness in determining organizational innovation adoption particularly in the context of technologies subject to bandwagon dynamics is explored.

Following the call by Fichman (2004); and Swanson & Ramiller (2004) for incorporation of mindfulness in IS research, several studies have since used it as a theoretical lens. A study of agile software development concluded that collective mindfulness is one of the emergent capabilities of an agile team (Vidgen & Wang, 2009). Studies of high reliability organizations have used mindfulness as a means of mitigating the potentially negative consequences of bandwagon behavior (Wolf, Beck, & Pahlke, 2012). A related study used mindfulness to examine information systems agility and established that mindfulness focuses on similar goals as agility (McAvoy et al., 2013). Finally, a study on the role of mindfulness in mobile business intelligence (mobile BI) adoption established that the enthusiasm of the executive and users affect the decisions of a company to adopt mobile BI (Tona & Carlsson, 2014). These studies examined the direct role of mindfulness on IT innovation adoption. To extend the application of organizational mindfulness as a lens for understanding IT innovation especially cloud computing, the current study puts forward the below proposition:

Proposition 3: Organizational mindfulness will determine cloud computing adoption by firms in Kenya.

2.4.4 Cloud Computing Adoption and Firm Performance

The quality of innovation is the extent to which an organization has adopted the right innovation, at the right time, and in the right way (Haner, 2002). Due to its pro-innovation bias, the dominant paradigm has been content to assume a positive relationship between the degree of innovation adoption and beneficial outcomes (Fichman, 2004). Studies measuring innovation quality have more often used performance impacts as a proxy. If beneficial result has been achieved after adopting an innovation, then the quality of the decisions as to what, when and how must have been good. While there are different ways of measuring firm performance (Haner, 2002), this study follows Zand (2010), which measured firm performance in terms of revenue, productivity, market share growth and profitability.

Studies investigating the impact of IT adoption on firm performance have produced mixed results. Two streams of research on IT adoption and firm performance can be distinguished. First, the stream focusing on the IT productivity paradox (Dos Santos, Peffers, & Mauer, 1993) which posit that despite enormous spending on IT, the benefits have not been found in aggregate firm performance statistics. The second stream indicate that IS has made a substantial and statistically significant contribution to firm output (Brynjolfsson & Hitt, 1993). A study on adoption of enterprise application software concluded that the adoption of groupware and supply chain management systems improved the performance of SMEs (Shin, 2006). Further, a study by Zand (2010) on enterprise systems adoption and firm performance found that enterprise system categories affect innovation and affect revenue, productivity and market share positively. This study aims at investigating to what extent cloud computing adoption affects firm performance and thus quality of IT innovation, thus the proposition:

Proposition 4: Cloud computing adoption will lead to increased firm performance by organizations in Kenya.

2.4.5 Organizational Mindfulness and Firm Performance

Cloud computing vision and institutional forces unlike rational efficiency theories argue that decision makers adopt an innovation depending on how many adopters there are and who specifically has adopted the innovation (Fiol & O'Connor, 2003).

This pressure on non-adopters to adopt leads to bandwagon behaviour. But even if an organization provisionally adopts an innovation as a result of bandwagon behaviour, charting a successful course of implementation that results into positive firm performance demands continued vigilance in maintaining and updating its conceptual framework (Swanson & Ramiller, 1997).

In order to chart a successful course of implementation, organizational mindfulness is needed to enable an organization reflect on its practical experience but also monitoring closely the further evolution of the innovation, its envisioned applications and its marketplace (Swanson & Ramiller, 1997). In a conceptual paper, Fichman (2004) hypothesized that organizations that exhibit greater organizational mindfulness will have more beneficial performance impacts for any given level of innovation. This study aims at empirically testing this hypothesis. In a study conducted by Baker (2007) to investigate the relationship between organizational mindfulness and small business performance, the results showed that there is a positive relation between the two constructs. Another empirical study on CEO championing of pricing found that organizational mindfulness is positively related to firm performance (Liozu & Hinterhuber, 2013). This is supported by the fact that decision makers in mindful organizations defer pricing decisions to centre-led pricing experts within the organization in order to optimize pricing decisions and firm performance (Liozu & Hinterhuber, 2012). The results of these empirical studies lead to the following proposition:

Proposition 5: Greater organizational mindfulness will lead to increased firm performance.

2.4.6 The Moderating Effect of Organizational Mindfulness

According to P. Wang (2009), organizations increasingly rely on others in a broader environment to make sense of IT innovations and to formulate the adoption decision. This makes organizational decision makers to increasingly rely on external dynamics in making their IT adoption decisions. Adopters of IT innovation often face significant challenges in acquiring the knowledge needed to understand and utilize the innovations effectively (Fichman & Kemerer, 1997). The organizing vision as a form of community learning enables organizations to learn how IT innovation can be

applied and to what ends. The organizing vision therefore, acts as a conceptual framework that helps to facilitate the innovation's diffusion by interpreting and legitimating it, and by mobilizing associated material activity (P. Wang & Ramiller, 2009). The learning gained through the organizing vision offers in broad strokes, collectively constructed knowledge about benefits, costs and implementation approaches of an innovation. According to P.Wang and Ramiller (2009), such a community learning is not a substitute for learning by each prospective adopter organization nor is it a substitute for an adopter's own innovation based on its on specific situation. Given that an organization that innovates mindfully with IT will feed community knowledge resulting from organizing vision into its own learning processes that are grounded in organizational specifics (Swanson & Ramiller, 2004) , the following proposition is a suggested:

Proposition 6: Organizational mindfulness has a moderating effect on the relationship between cloud computing vision and cloud computing adoption.

In today's dynamic IT environment and consumer driven market, organizations need to respond continuously to measure up to the changing IT environment and customer needs. However, the manner in which organizations respond to these changes depend on the socio-political, economic and technological influences exerted by the environment in which they operate (Weerakkody et al., 2009). From an institutional perspective, these influences manifest themselves in the form of institutional pressures. According to Strang and Tuman (1993), when institutional forces are strongly present, the IT adoption decisions made by an organization will be contingent not just on a firm's own independent assessment of the innovation's merits but will also depend on just who prior adopter are. This results into what has been characterized as the bandwagon phenomenon (Abrahamson, 1991; Abrahamson & Rosenkopf, 1993) , where adopting organizations entertain scant reasoning for their move especially where the innovation achieves a high public profile. But Swanson and Ramiller (2004) argue that attention to organizational specifics in the form of organizational mindfulness is crucial in supporting sound judgments about whether adopting a particular IT innovation is a good thing to do, when committing to the innovation is likely best to take place, and how implementation and assimilation can best be pursued. Mindfulness plays a dual role in innovation, enhancing the

recognition of organizational circumstances demanding an innovative response, while also fostering effectiveness in executing the response itself (Swanson & Ramiller, 2004). Organizational mindfulness is not simplistically promotive of innovation but may also entail wariness in some circumstances, and where needed it may foster a resistance to jumping on innovation bandwagons (Fiol & O'Connor, 2003, p. 66). Mindful organizations apart from making IT innovation adoption decisions based on their organizational specifics will also make better decisions throughout the implementation process leading to increased firm performance. Informed by the preceding discussion, the following propositions are made:

Proposition 7: Organizational mindfulness has a moderating effect on the relationship between institutional forces and cloud computing adoption.

Proposition 8: Organizational mindfulness has a moderating effect on the relationship between cloud computing adoption and firm performance.

2.4.7 The Socio-Cognitive Model of Cloud Computing Adoption

Several studies in IT innovation adoption have applied the dominant paradigm that is typified by the desire to explain innovation adoption using economic rationalistic models (Fichman, 2004). Despite so much at stake, the dominant paradigm for IT innovation research is primarily focused on the adoption of new IT in the material rather than the conceptual form (P. Wang, 2009). To account for the adoption of IT in the conceptual form, researchers have explored and employed socio-cognitive theories like organizing vision, institutional forces and organizational mindfulness. A number of studies have used these socio-cognitive theories to explain the adoption of various IT innovations. For example, a number of studies have investigated the role of organizing vision on IT innovation adoption (Ramiller & Swanson, 2003; Yang & Hsu, 2011). Other studies have examined the role of institutional forces on IT innovation adoption (Benders et al., 2006; Teo et al., 2003; Trope, 2014). The role of organizational mindfulness on IT innovation adoption has also received substantial attention from researchers (McAvoy et al., 2013; Tona & Carlsson, 2014; Vidgen & Wang, 2009).

Lacking substantial research effort in the IT innovation domain is the development of

a model that incorporates the roles of organizing vision, institutional forces and organizational mindfulness into a single socio-cognitive model of IT innovation adoption. The current study bridges this research gap by using the constructs of cloud computing vision, institutional forces and organizational mindfulness to build and test a socio-cognitive model of cloud computing in particular and IT innovation adoption in general. The model is presented in Figure 2.2.

2.5 Summary of Literature Review and Knowledge Gaps

In the literature review, both theoretical and empirical studies concerning organizing vision, institutional forces, organizational mindfulness and firm performance are discussed. The summary of empirical studies shown in Table 2.1 is a synthesis of the various key studies that informed the formulation of this study's thesis. The summary puts together the purpose of the study articles reviewed, methodologies employed by each of the study and the findings. The summary also includes the knowledge gaps identified from each of the study and how the present study intended to them where possible.

Table 2.1: Summary of Empirical Studies

Studies	Purpose	Methodology	Findings	Gaps	Contribution of this study
(Ramiller & Swanson, 2003)	How IS executives respond to visions at different stages	-Mixed approach	-Interpretability, plausibility, importance and discontinuity determine response to a vision.	-Not focused on role of a vision to IT adoption.	-Will focus on the role of cloud computing vision in adoption of IT innovation
(Yang & Hsu, 2011)	Organizing vision for cloud computing in Taiwan	Qualitative using secondary data analysis	There is institutionalization of cloud computing in Taiwan	Does not examine role of organizing vision in cloud computing adoption.	-Examine role of cloud computing vision in cloud computing adoption.
(Tona & Carlsson, 2014)	Mindfulness and mobile BI adoption.	Quantitative study	-Organizing vision motivates adoption of mobile BI.	-Focuses on mobile business intelligence adoption and not cloud computing	-Role of cloud computing vision in cloud computing adoption.

Studies	Purpose	Methodology	Findings	Gaps	Contribution of this study
				adoption.	
(Teo et al., 2003)	Role of institutional pressures on the adoption of FEDI	Quantitative study using structural equation modeling (SEM)	Results showed that all the three institutional pressures had influence on organization adoption of FEDI.	-Studied adoption of FEDI.	-Aims to study cloud computing adoption.
(Benders et al., 2006)	ERP deployment	-Case study	Institutional pressures have a role in ERP adoption.	-Uses a mature and not a recent IT innovation.	-Will use cloud computing as focal IT innovation. -Adopts quantitative method.
(Liang et al., 2007a)	Investigates the mediating role of top management on institutional forces in ERP use.	-Quantitative using PLS analysis	-Confirms that institutional pressures contribute to post implementation assimilation of ERP.	-Does not use cloud computing as the focal technology -Does not investigate the mediating role of organizational cognition.	-Uses cloud computing which is one of the recent IT innovations as the focal technology. -Investigates the mediating role of mindfulness.
(Trope, 2014)	Cloud Computing adoption in South Africa.	-Quantitative using PLS analysis	-Concludes that mimetic pressures are more influential in determining cloud computing adoption compared to coercive and normative forces.	-Carried out in South Africa and not Kenya	-Will conduct study in Kenyan context.
(Vidgen & Wang, 2009)	-Relationship between mindfulness and software development	Exploratory study.	-Established that collective mindfulness is one of the emergent capabilities of an agile team.	-Focused on individual mindfulness	Role of organizational mindfulness in cloud computing adoption.
(McAvoy et al., 2013)	-Mindfulness and software agility.	Exploratory study.	-Established that mindfulness focuses on the same goals as software agility.	.-Not focused on IT innovation adoption.	-Role of organizational mindfulness in cloud computing

Studies	Purpose	Methodology	Findings	Gaps	Contribution of this study
(Tona & Carlsson, 2014)	Mindfulness and mobile business intelligence adoption.	Qualitative using content analysis.	-Mindfulness has a role in mobile business intelligence adoption.	-Focuses on mobile business intelligence adoption and not cloud computing adoption.	-Role of mindfulness in cloud computing adoption.
(Shin, 2006)	Adoption of enterprise application software and firm performance.	-Qualitative case study.	Adoption of groupware and supply chain management systems improved the performance of SMEs.	-Used groupware as the focal technology -Adopted a case study approach	-Use cloud computing as focal technology. -Quantitative using SEM.
(Zand, 2010)	Enterprise systems adoption and firm performance	-Quantitative using logistic model.	Enterprise systems affect revenue, productivity and market share positively.	-Used mature innovations like ERP	-Will adopt a nascent innovation i.e. cloud computing.
(Liozu & Hinterhuber, 2013)	Aimed to investigate the relationship between organizational mindfulness and firm performance in the context of product pricing.	Quantitative study employing structural equation modeling (SEM) to test hypothesis.	The study found that that organizational mindfulness is positively related to firm performance.	The study focused on pricing strategies and not IT innovation.	-This study aims to fill the gap by determining the role of organizational mindfulness and IT innovation adoption.
(Fichman, 2004)	Alternative theories to the dominant paradigm.	Conceptual paper.	Hypothesized the moderating effect of mindfulness on the relationship between IT innovation adoption and firm performance.	-Not empirically tested.	-Aims to validate the role of mindfulness in cloud computing adoption and firm performance.

2.6 The Conceptual Framework

The conceptual model in Figure 2.1 represents the relationships amongst cloud computing vision, institutional forces, organizational mindfulness and cloud computing adoption. It also indicates the link between cloud computing adoption,

organizational mindfulness and firm performance. The model further shows the moderating effect of organizational mindfulness on the following relationships: 1) cloud computing vision and cloud computing adoption, 2) institutional forces and cloud computing adoption, and 3) cloud computing adoption and firm performance.

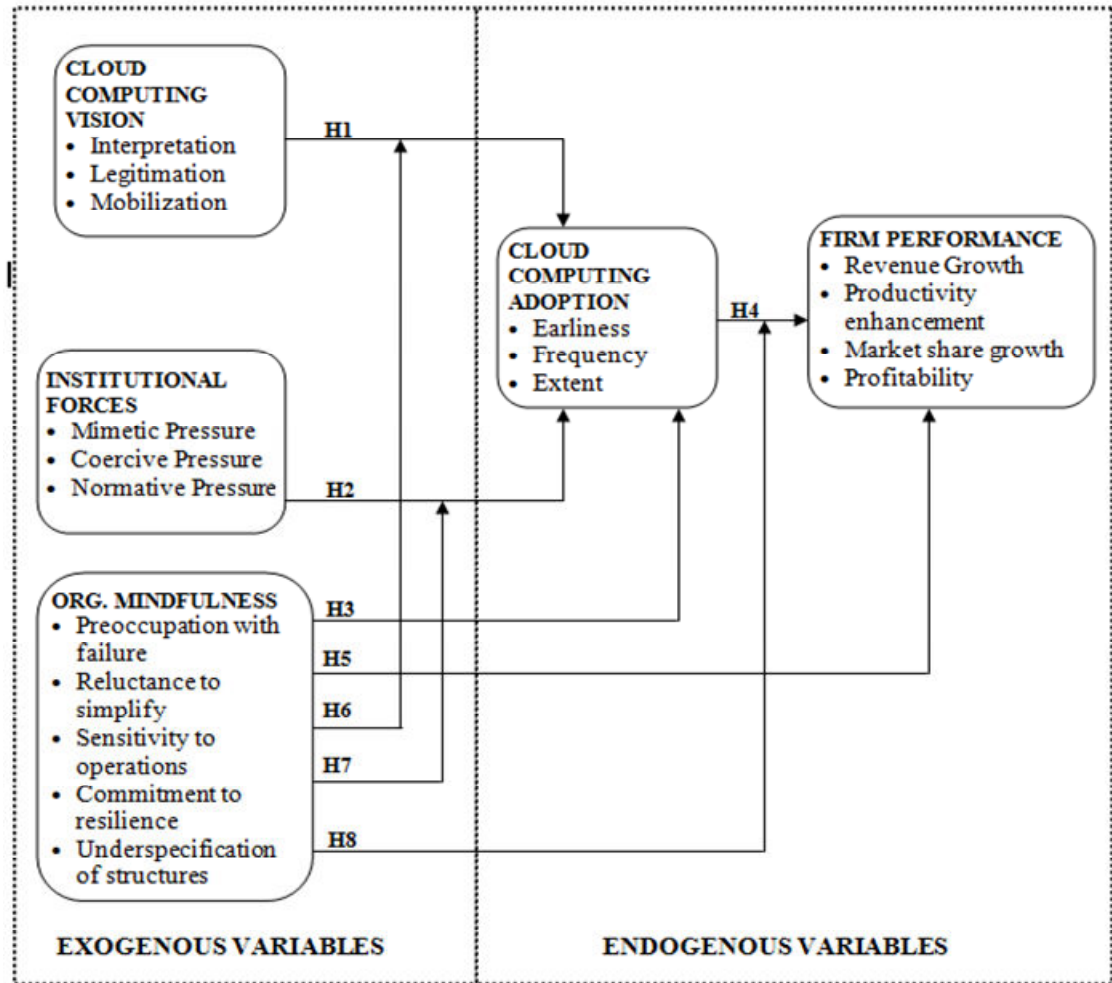


Figure 2.4: The Conceptual Model of the Study

2.7 The Research Hypotheses

The study, through a thorough review of the socio-cognitive approaches to IT innovation adoption literature, proposes that organizational mindfulness moderates the relationship between socio-cognitive factors and cloud computing adoption. It is further proposed that organizational mindfulness moderates the relationship between cloud computing adoption and firm performance. From these general propositions, the study aims at testing the following hypotheses:

H1: There is a relationship between cloud computing vision and cloud computing adoption.

H2: There is a relationship between institutional forces and cloud computing adoption.

H3: There is a relationship between organizational mindfulness and cloud computing adoption.

H4: There is a relationship between cloud computing adoption and firm performance

H5: There is a relationship between organizational mindfulness and firm performance.

H6: Organizational mindfulness has a significant moderating effect on the relationship between cloud computing vision and cloud computing adoption.

H7: Organizational mindfulness has a significant moderating effect on the relationship between institutional forces and cloud computing adoption.

H8: Organizational mindfulness has a significant moderating effect on the relationship between cloud computing adoption and firm performance.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the philosophical approach and research methodology adopted in conducting this study. The philosophical approaches discussed are positivism, interpretivism and critical. This is followed by a discussion on the research design, study population and the sampling approaches. A brief description of the data collection methods, reliability and validity testing follows. The chapter concludes with a discussion on how the data will be analyzed and presented.

3.2 Philosophical Orientation

Research philosophy lays the foundation of knowledge upon which important assumptions of a study are based. In IS research, three philosophical approaches dominate, namely; interpretivism, critical and positivism. In interpretive philosophy, reality is not objective but socially constructed and the researchers' role is to understand the inter-subjective meanings embedded in social life (Orlikowski & Baroudi, 1991). The main weakness of interpretivism is that it ignores the possible structures of conflict within a society - structures that would generate change. Critical perspective aims at providing an evaluative dimension, by attempting to critically evaluate and transform the social reality under investigation (Orlikowski & Baroudi, 1991). Embedded in the positivist approach is the existence of a physical and social world independent of human beings and the researchers' duty is to explain this world through universal laws and principles (Orlikowski & Baroudi, 1991). It has been criticized for overly abstracting or oversimplifying the complex IS phenomena through a few unilateral relationships (Somasundaram & Karlsbjerg, 2003).

Ontologically, positivist research assumes an objective, physical, and social world that can be relatively easily apprehended, characterized, and measured. Epistemologically, the positivist perspective is concerned with the empirical testability of theories. The theories to be tested are premised on the existence of a priori fixed relationships within phenomena that can be identified and tested through hypothetico-deductive logic and analysis. A priori nomological net comprising cloud computing vision, institutional forces, cloud computing adoption, organizational mindfulness and firm performance has been specified.

3.3 Research Design

The study used a cross sectional survey to gather data from the respondents. The cross sectional survey has been found to be robust for effects of relationship studies in previous information systems studies such as Teo et al. (2003), Liang et al. (2007a) and Wolf et al.(2009). On the explanatory aspect, the study examined the relationship amongst various variables by way of hypothesis testing. The descriptive aspect of the study used descriptive statistics techniques to represent summary data on the various constructs in this study in order to understand them better. A single cross-sectional survey was conducted to collect primary data from ICT, financial and manufacturing firms. The data collected was used to perform both explanatory and descriptive data analysis.

A cross sectional study is appropriate where the overall objective is to establish whether significant associations among variables exist at some point in time. A further advantage of cross sectional survey is that it enhances the credence of results by providing conclusions on data as at a given point in time. Since this study has a priori model, the survey method is suitable as it provides a basis for establishing generalizability, replicability and statistical power (Teo et al., 2003).

3.4 Population of the Study

The target population of this study was firms within the financial, ICT and manufacturing sector. The firms in the financial sector were identified from both the Central Bank of Kenya website (www.centralbank.go.ke) and the Insurance Regulatory Authority website (www.ira.go.ke) as there is no single database listing all the firms in the financial sector. There are a total of 138 licensed firms in the financial sector with 53 of them being in the banking sector and 71 firms in the insurance sector.

The firms in the ICT sector were identified from the list of licensed organizations in this sector available on the Communications Authority (CA) of Kenya website (www.ca.go.ke). These firms are categorized in terms of the services they offer. This study selected firms from the category of content service providers as it provides a representative list of firms in the sector. According to CA, there are 221 licensed content service providers from a total of 1278 licensed firms in the ICT sector. In the

manufacturing sector, a population of 627 large manufacturing firms formed part of the population. The large manufacturing firms were identified from the Kenya Manufacturing Association's handbook (KAM, 2011).

3.5 Sampling Technique

The firms from the financial, ICT and manufacturing sectors constituted were sampled for this study. Since the study uses Structural Equation Modeling (SEM), sampling techniques adopted in SEM studies were used to determine the sample size. Two approaches are usually used to determine sample size for SEM data analysis: 1) N:q ratio where N=number of cases and q= number of model parameters. The ideal ratio should be 20:1 according to Jackson (2003). 2) Sample size by using precedence. This involves taking the approximate medium sample size in survey of published articles in which SEM results are reported (Kline, 2010).

In this study, there are five model parameters to be estimated (figure 2.2) therefore a sample size of 120 is required following Jackson (2003). In order to take care of possible non response an additional 20 firms were sampled from each sector. This resulted into an additional 60 leading to a total of 180 as the final sample size. Stratified random sampling was used to draw a sample of 60 firms from each of the three sectors.

3.6 Data Collection

The survey questionnaire (Appendix A) was the main instrument for collecting primary data from the respondents. A single questionnaire was used to capture data from each of the sampled 180 firms. The questionnaire instrument was administered to the managers having ICT related responsibilities in each of the firms. The questionnaire items required responses on the perceived cloud computing vision, perceived institutional forces, cloud computing adoption, organizational mindfulness and perceived firm performance. The subjective measures for firm performance were used since it is difficult to get financial reports of firms not listed in Nairobi Stock Exchange. The questionnaire items for the various scales were adapted from literature sources that have studied similar constructs and variables.

The questionnaire was administered to the respondents online. The web based

questionnaire was designed using Survey Monkey[®] and sent to the respondents through their email addresses. A link to the letter of introduction signed by the Associate Dean, graduate business studies was included in the email sent to the respondents. The web based survey was administered to managers with ICT related responsibilities within the firms. Though internet based surveys are similar to surveys with mail questionnaires, the former are considerably faster (Tse, 1998) and more cost effective (Sheehan & McMillan, 1999). Additional advantages of email and web based questionnaires over mail questionnaires is that they are environment friendly (Tse, 1998), allow multimedia content (Best & Krueger, 2002) and offer easier data translation (Healey, Baron, & Ilieva, 2002). In administering the web questionnaire, an initial email invitation was sent to the sampled respondents. After the initial invitation, four rounds of reminders were sent out with different formulations of invitation text to improve the response rate as recommended by Sivo (2006). The web based questionnaire, introduction letter and the differentiated reminders are contained in appendix C.

The data collected was used to assess the constructs of cloud computing vision, institutional forces, organizational mindfulness, cloud adoption and firm performance. The respondents were asked to assess different items on scales that are known to capture the study constructs. The questionnaire comprised of direct measures and Likert scale measures. The direct data was used mainly to measure organizational demographics while Likert scale data was used to test for relationships between indicators and their latent constructs; and the relationship between latent constructs.

The unit of this study was an organization or a firm in the ICT, financial and manufacturing sectors. Since the purpose of the study was to understand adoption of cloud computing by organizations in Kenya, the respondents consisted of managers with ICT related responsibilities. Prior research in management suggests that the perceptions of top management reflects the collective perspective of the organization and therefore the subjective opinions of top managers are held as reliable sources of firm level data (Anthony Pecotich, Felicity J. Purdie, & John Hattie, 2003). Further, IT managers deal directly with technological and organizational issues on a daily basis and attempt to resolve those issues through well informed choices and the capability and applicability of IT innovations (Ezell, 2015, p. 66). The respondents

consisted of Chief Information Technology Officers, ICT Managers, Information Systems Managers, Chief Information Officers, and Information Security Managers. An “Others” option was included in the questionnaire to cater for ICT responsibilities that are not captured by the above titles.

3.7 Operationalization of Variables

The various constructs of the study are operationalized in this section. Cloud computing vision, organizational mindfulness, cloud computing adoption and firm performance have been operationalized as second level reflective constructs as recommended by Urbach and Ahlemann (2010). Institutional forces are instantiated as a second order formative construct following Teo et al (2003). The details of how each variable has been operationlized is presented in table 3.1 below.

Table 3.1: Operationalization of Variables

Variable	Indicators	Measures	Questionnaire Items	Supporting Literature
Cloud computing Vision	Interpretation	-Understanding of cloud computing, -Information about cloud computing. -Discussion of cloud computing. -Different perspectives.	2.2 (1-6)	(Ramiller & Swanson, 2003)
	Legitimation	-Features and usage of cloud computing -How cloud computing solves business problems. -How cloud computing improves financial and business performance. -Reputation of cloud vendors.	2.3 (1-11)	(Kaganer et al., 2010)
	Mobilization	-Material realization of the innovation through activation, motivation and coordination.	2.4(1-5)	(P. Wang, 2009)
Institutional forces	Mimetic Pressures	-If competitors who have adopted cloud computing have benefited. -How competitors who have adopted are perceived by customers and suppliers. - How competitors who have adopted are perceived by others in the industry.	3.1 (1-4)	(Liang et al., 2007a; Teo et al., 2003)
	Coercive Pressures	-Influence of government in cloud adoption. -Influence of industry associations.	3.1 (5-8)	

Variable	Indicators	Measures	Questionnaire Items	Supporting Literature
		-Influence of parent organization. -Influence from competitive conditions.		
	Normative Pressures	Influence from extent of adoption by customers, suppliers, Government and industry associations.	3.2 (1-4)	
Organizational Mindfulness	Preoccupation with Failure	-Focus on failure over success -Learning from failure -Reporting of failure -Reward for people who spot and report failures	4.1(1-5)	(Dernbecher et al., 2014; J. Ray, Baker, & Lowman, 2011; Wolf et al., 2009)
	Reluctance to Simplify	-Extent to which questioning is encouraged. -Extent to which people are encouraged to have different views. -Appreciation of sceptics	4.1(6-9)	
	Sensitivity to Operations	-Extent of information sharing -Accessibility and availability of experts. -Availability of additional resources to handle unexpected situations. -Communication of operational anomalies as they occur. -Sharing of the current operational situation	4.1 (10-14)	
	Commitment to Resilience	-Commitment to solve any problem that occurs. -Ability of people to use their knowledge in novel ways. -Availability of informal contacts that can be used to solve problems. -Tasks that enable people to learn more about operational processes.	4.1 (15-19)	
	Under-specification of Structures	-Knowledge of people who can solve particular problems. -Sharing of knowledge with those who know. -Value of experience and expertise over hierarchical rank. -People with experience and expertise are freely allowed to make decisions.	4.1 (20-23)	
Cloud Computing	Earliness of Adoption	-The benefits accrued by early adopters of technology. The link between adoption timing and performance outcomes.	5.1(1-4) 5.2(1-10)	(Dos Santos et al., 1993; Ramamurthy

Variable	Indicators	Measures	Questionnaire Items	Supporting Literature
Adoption	Frequency of Adoption	-How often the organization adopts innovations.		Premkumar, & Crum, 1999)
	Extent of Adoption	-The link between performance and how firms implement an innovation.		
Firm Performance	Revenue Growth	-Change in company's turnover since the adoption of cloud computing.	6.1(1)	(Haner, 2002; Zand, 2010)
	Productivity enhancement	-Change in company's productivity since the adoption of cloud computing.	6.1(2)	
	Market Share change	-Change in company's share in its significant market changed since the adoption of cloud computing.	6.1(3)	
	Profitability	-Company's profitability since the adoption of cloud computing.	6.1(4)	

3.8 Data Analysis

The data analysis was done using the SEM technique. SEM is a single systematic statistical technique for testing and estimating causal relationships amongst latent variables (Urbach & Ahlemann, 2010). It will be used to estimate the relationships amongst cloud vision, institutional forces, cloud adoption, firm performance and organizational mindfulness. SEM was used in this study because it has potential advantages over regression analysis that make SEM a priori the methods of choice in analyzing path diagrams when this involve latent variables with multiple indicators (Gefen, Straub, & Rigdon, 2011). SEM comes with the power to integrate the measurements (measurement model) and the hypothesized causal paths (structural model) into a simultaneous assessment. The one unified measurement and structural model is estimated and the results are presented as one unified model in which the path estimates of both the measurement and the structural models are represented as a whole. This process makes the estimation produced by SEM better than those produced by linear regression when the distribution assumptions hold (Gefen et al., 2011).

Currently, there are two most widely used approaches to SEM namely; partial least squares (PLS) SEM (Wold, 1985) and covariance based SEM (CBSEM) (Jöreskog, 1969). These two approaches differ in their analyses' objectives, their underlying statistical assumptions, and the nature of the fit statistics they produce. PLS SEM is

considered more appropriate for exploratory research and shares the modest distributional and sample size requirements of ordinary least squares regression (Chin, 2010). The CBSEM approach, in contrast, addresses the problem of measurement error by explicitly modeling the measurement error variance structures and relies on a factor analytic measurement model (Gefen et al., 2011). This study adopted PLS SEM because of two major reasons. Firstly, PLS SEM was chosen because this study involved a small sample size of 180 selected firms from the ICT, financial and manufacturing sectors. Reinartz et al. (2009) reiterated that choosing PLSM SEM over CBSEM when the samples size is limited is sensible as relative error of parameters increases less quickly with decrease in sample size for PLS than it does for CBSEM. Secondly, this study aims at estimating a prior with a large number of indicators and latent variables in which case PLS SEM is preferred over CBSEM (Chin, 2010). The summary of data analysis procedures are presented in Table 3.2 and its SEM diagram in Appendix B.

Before analyzing either a raw text file or a matrix data file, the original data must be screened for the problems of collinearity, outliers and missing data. When the period of data collection was over, the responses that were stored in Survey Monkey were exported to both Microsoft Excel and SPSS. From both Microsoft Excel and SPSS, data about the email address, date of response, collector ID and IP addresses of the respondents' computers were removed. The data was then coded and analyzed with items grouped according to the various study constructs. Data screening was done before importing the data to a SEM software package for both measurement and structural estimation.

3.9 Measurement Model Development

Following data screening and analysis of descriptive statistics, data was purified through exploratory factor analysis (EFA) to make it ready for both measurement and model estimation. The EFA was done using the factor reduction tool in SPSS. Even though the measurement scales were adapted from previous studies, they have not been used within the context of organizations in Kenya thus making measurement purification important. The aim of purification was to refine the variables into the most effective number of factors by selecting the variables with high correlations with all other variables (Kline, 2010, p. 54).

The EFA analysis was initially conducted on the factors of each of the latent variables in the study. In order to ensure that the analysis would highlight theoretically meaningful constructs, EFA analysis was conducted using principal component analysis with varimax rotation. EFA factors were analyzed using a number of criteria such as eigen values, total variance explained, factor loadings, item to total correlations and reliability coefficients. A few items that had low item to total correlations, low loading to intended factors and high cross loadings were removed. After the rationalization of the factors, the measurement model was developed using SmartPLS3 after which the factors were assessed for validity and reliability.

3.9.1 Validity

Since the measurement scales used in the questionnaire were derived from existing conceptual and empirical literature, they are deemed to have face validity. Face validity, usually used in studies of similar nature, for example Teo et al. (2003) determine if the instrument measured what it is supposed to measure. Content validity was tested using the responses from a pilot study involving ICT managers selected from 17 firms within the ICT, financial and manufacturing sectors for comprehension, logic and relevance. The feedback obtained was used to revise the scales before administering the questionnaire to all the potential study respondents. In a SEM analysis, the validity of the measurement model is evaluated to determine how accurate the measures are in representing each construct. This was done by testing the convergent and discriminant validities of the measures.

The convergent validity tests were conducted to measure the amount of variance that a latent variable component captures from its indicators relative to the amount due to measurement error (Urbach & Ahlemann, 2010). It therefore involves the degree to which individual items reflecting a construct converge in comparison to items measuring different constructs. A commonly applied criteria of assessing convergent validity is the average variance extracted (AVE) proposed by Fornell and Larcker (1981). An AVE of at least 0.5 demonstrates that a latent variable is on average able to explain more than half of the variance of its indicators and therefore sufficient convergent validity (Urbach & Ahlemann, 2010).

Discriminant validity estimates the degree to which the measure of individual constructs differ from one another (Chin, 1998a). Whereas convergent validity tests whether a particular item measures the construct it is supposed to measure, discriminant validity tests whether the items do not unintentionally measure something else. The discriminant validity was assessed by checking the cross loadings as recommended by Chin (1998a). If the loading of each indicator is higher for its designated construct compared to other constructs and each of the constructs loads highest with its own items, it can be inferred that the model's constructs differ sufficiently from one another.

After the measurement models were successfully validated, the structural model was analyzed. The first component of the structural model to be assessed was the coefficient of determination (R^2) of each of the latent variables. R^2 measures the relationship of a latent variable's explained variance to its total variance (Urbach & Ahlemann, 2010). The values should be sufficiently high with Chin (1998b) considering values of approximately 0.670 substantial, values around 0.333 average, and values of 0.190 and lower as weak.

3.9.2 Reliability

The reliability of the individual scale items was assessed by inspecting the internal consistency values and the loading of the items on their corresponding constructs. The Cronbach's alpha (CA) (Cronbach, 1951), which is the traditional criterion for assessing internal consistency reliability was used. Since CA tends to severely underestimate the internal consistency reliability of latent variables in PLS SEM models, an alternative, composite reliability (CR) (Werts, Linn, & Jöreskog, 1974) was also assessed. While CA assumes that all indicators are equally reliable, CR takes into account that indicators have different loadings. Regardless of which coefficient is used for assessing internal consistency, values above 0.700 are desirable and values below 0.600 indicate a lack of reliability (Urbach & Ahlemann, 2010).

Another important reflective measurement assessment is that of indicator reliability. Indicator reliability describes the extent to which a variable or a set of variables is consistent regarding what it intends to measure. The indicators' reflective loadings were monitored to assess the indicator reliability. The indicator loadings should be

significant at least at the 0.05 level and greater than 0.707 (Chin, 1998b). The significance of the indicator loadings were testing using bootstrapping as a resampling method.

3.10 Structural Model Development and Estimation

After the measurement models had been successfully evaluated, the inner or structural model was analyzed to test the plausibility of the hypothetical relationships amongst the latent variables. The path coefficient estimates, T – values, overall model fit and significance levels for the structural paths were evaluated to investigate the causal relationships among the latent variables proposed in the research’s nomological net.

The path coefficients were checked for the algebraic sign, magnitude and significance. The path coefficient’s magnitude was checked to determine the strength of the relationship between any two latent variables. A path coefficient of 0.100 and above was considered to account for a certain impact within the model (Huber et al. cited in Urbach and Ahlemann, 2010). Furthermore, path coefficients should be significant at least at the 0.50 level. In order to determine the significance, bootstrapping was used as recommended by Efron (1992).

3.11 Testing for Moderation and Mediation

Moderation and mediation are forms of interaction effects in a model. A variable with an interaction effect is one that influences the impact of an exogenous variable on an endogenous variable (Batista Foguet, Coenders, Saris, & Bisbe, 2004). Moderated regression analysis (MRA) which is widely used in management research for testing models that involve interaction effects was used to test for moderation. In its usual formulation, MRA includes as an additional regressor a multiplicative term between two exogenous variables which represents the interaction effect (Irwin & McClelland, 2001). In order to test for moderation, two recommended tests are used; SmartPLS moderating effect which uses the product indicator approach, and difference in R² recommended by (Chin, 1998b). The effect size (f²) which measures if an independent latent variable has a substantial impact on dependent latent variable was calculated as recommended by Chin (1998b). Values of f² like 0.020, 0.150 and 0.350 indicate that the predictor variable has low, moderate and high effect on the structural model.

3.12 Hypothesis Testing and Data Analysis Procedures

The table below provides a summary of the objectives of the study, presented with their respective hypotheses and how they were tested. It also summarizes the data analysis procedures for the study.

Table 3.2: Hypotheses Testing

Objective	Hypothesis	Analysis	Accept/Reject Criteria
To examine the relationship between cloud computing vision and cloud computing adoption.	H1 There is a relationship between cloud computing vision and cloud computing adoption.	-Partial Least Squares analysis. -Path coefficients and T values. -Degree of correlation is positive or negative. -Bootstrapping	-Accept hypothesis when level of significance indicated by T values are: T \geq 1.65 at $\alpha = 0.1$ T \geq 1.96 at $\alpha = 0.05$ T \geq 2.5 at $\alpha = 0.001$ (two tailed)
To examine the relationship between institutional forces and cloud computing adoption.	H2 There is a relationship between institutional forces and cloud computing adoption.	-Partial Least Squares analysis. -Path coefficients and T values. -Degree of correlation is positive or negative. -Bootstrapping	-Accept hypothesis when level of significance indicated by T values are: T \geq 1.65 at $\alpha = 0.1$ T \geq 1.96 at $\alpha = 0.05$ T \geq 2.5 at $\alpha = 0.001$ (two tailed)

Objective	Hypothesis		Analysis	Accept/Reject Criteria
To establish the relationship between organizational mindfulness and cloud computing adoption.	H3	There is a relationship between organizational mindfulness and cloud computing adoption.	-Partial Least Squares analysis. -Path coefficients and T values. -Degree of correlation is positive or negative. -Bootstrapping	-Accept hypothesis when level of significance indicated by T values are: $T \geq 1.65$ at $\alpha = 0.1$ $T \geq 1.96$ at $\alpha = 0.05$ $T \geq 2.5$ at $\alpha = 0.001$ (two tailed)
To establish the relationship between cloud computing adoption and firm performance.	H4	There is a relationship between cloud computing adoption and firm performance.	-Partial Least Squares analysis. -Path coefficients and T values. -Degree of correlation is positive or negative. -Bootstrapping	-Accept hypothesis when level of significance indicated by T values are: $T \geq 1.65$ at $\alpha = 0.1$ $T \geq 1.96$ at $\alpha = 0.05$ $T \geq 2.5$ at $\alpha = 0.001$ (two tailed)
To establish the relationship between organizational mindfulness and firm performance.	H5	There is a relationship between organizational mindfulness and firm performance.	-Partial Least Squares analysis. -Path coefficients and T values. -Degree of correlation is positive or negative. -Bootstrapping	-Accept hypothesis when level of significance indicated by T values are: $T \geq 1.65$ at $\alpha = 0.1$ $T \geq 1.96$ at $\alpha = 0.05$ $T \geq 2.5$ at $\alpha = 0.001$

Objective	Hypothesis	Analysis	Accept/Reject Criteria
			(two tailed)
To establish the moderating effect of organizational mindfulness on the relationship between cloud computing vision and cloud computing adoption.	H6 Organizational mindfulness has a significant moderating effect on the relationship between cloud computing vision and cloud computing adoption.	-Partial Least Squares analysis. -Path coefficients and T values. -Degree of correlation is positive or negative. -Moderated regression analysis. -Bootstrapping	-Accept hypothesis when level of significance indicated by T values are: T ≥ 1.65 at α =0.1 T ≥ 1.96 at α =0.05 T ≥ 2.5 at α =0.001 (two tailed)
To establish the moderating effect of organizational mindfulness on the relationship between cloud computing adoption and firm performance.	H7 Organizational mindfulness has a significant moderating effect on the relationship between institutional forces and cloud computing adoption.	-Partial Least Squares analysis. -Path coefficients and T values. -Degree of correlation is positive or negative. -Moderated regression analysis. -Bootstrapping	-Accept hypothesis when level of significance indicated by T values are: T ≥ 1.65 at α =0.1 T ≥ 1.96 at α =0.05 T ≥ 2.5 at α =0.001 (two tailed)
To establish the moderating effect of organizational mindfulness on the relationship between cloud computing adoption and firm performance.	H8 Organizational mindfulness has a significant moderating effect on the relationship between cloud computing adoption and firm performance.	-Partial Least Squares analysis. -Path coefficients and T values. -Degree of correlation is positive or negative. -Moderated regression analysis.	-Accept hypothesis when level of significance indicated by T values are: T ≥ 1.65 at α =0.1 T ≥ 1.96 at α =0.05

Objective	Hypothesis		Analysis	Accept/Reject Criteria
performance.			-Bootstrapping	$T \geq 2.5$ at $\alpha = 0.001$ (two tailed)

CHAPTER FOUR: DATA ANALYSIS AND FINDINGS

4.1 Introduction

This chapter presents the results of the statistical analyses, interpretation and findings of the study. The chapter begins with a presentation of the results of the survey administration and data collection for both the pilot and final studies. It provides information on population demographics, respondent characteristics and response rates. This is followed by an analysis of the data collected and results from the examination of measurement model. The examination of the measurement model included fit statistics, as well as reliability and validity of the measures used. The structural model was examined in order to test the hypotheses. The details of the measurement and structural models, after being estimated using SmartPLS (Ringle, Wende, & Becker, 2015), are then interpreted in the light of study objectives.

4.2 Pilot Study and Instrument Testing

The pilot study to pretest the data collection tool and the data analysis tool was launched with 18 respondents using a web based survey tool as per the process in chapter 3. The survey instrument was emailed to 30 managers with ICT related responsibilities in the financial, ICT and manufacturing sectors. The pilot study mailing list was generated using stratified random sampling. A sample of 10 firms was randomly selected from each of the sectors. A cover letter accompanied the emailed questionnaire. The cover letter explained to the respondents the purpose of the study and asked them to share their comments regarding the quality of the questionnaire.

After making several follow-ups, 17 out of the 30 respondents filled the questionnaire, giving a response rate of 56 percent. Out of the 17 responses received, 14 were complete while 3 were incomplete. The majority of the responses were received from the firms in the ICT sector. The numbers of respondents for the pilot study by industry are summarized in the Table 4.1 below:

Table 4.1: Respondents by Industry

Industry	Mailed	Responded	Response Rate
Financial	10	5	50%
ICT	10	9	90%
Manufacturing	10	3	30%

The feedback received from the respondents in the pilot study was used to modify the study questionnaire. For example, in item 7 of the questionnaire, information sources for cloud computing was reduced to 8 from 13 after several respondents pointed out that it was difficult to rank the 13 items. It was also noteworthy that most respondents did not complete this questionnaire item.

4.3 Data Collection and Respondent Characteristics

This section describes how the data collection was conducted and measures that were taken to ensure adequate response rate. The characteristics of the respondents in terms of job title, experience, industry, firm age and firm size are then described and interpreted.

4.3.1 Data Collection

A web based survey using Survey Monkey[®] was used to collect data for the study. Survey Monkey[®] has recently become an important web based data collection tool for IS researchers. A number of studies including Elragal and Dalia (2011) and Hyseni, Brown and Gannon (2015) used Survey Monkey[®] to collect data. A total of two months was spent collecting the data by forwarding the link of the questionnaire to the firms that were sampled. The empirical study focused on firms in the financial, ICT and manufacturing sectors. The web based survey was administered to managers with ICT related responsibilities within the firms.

Though internet based surveys are similar to surveys with mail questionnaires, the former are considerably faster (Tse, 1998) and more cost effective (Sheehan & McMillan, 1999). Additional advantages of email and web based questionnaires over mail questionnaires is that they are environment friendly (Tse, 1998), allow multimedia content (Best & Krueger, 2002) and offer easier data translation (Healey et

al., 2002). In administering the web questionnaire, an initial email invitation was sent to the sampled respondents. After the initial invitation, four rounds of reminders were sent out with different formulations of invitation text to improve the response rate as recommended by Sivo (2006).

The 180 email invitations that were sent to the respondents were all delivered. Of these invitations, 97 responses were received for a response rate of 53.8 percent. On examination of the completeness of the questionnaires, 15 were found to be incomplete. Of the 15 incomplete questionnaires, 4 were discarded as the respondents only filled the demographic items which comprised 40 percent of the total questionnaire items. The remaining 11 incomplete questionnaires were used as the respondents had answered most of the questions. The questionnaires may have not been completed due to several factors: perceived confidentiality of data, lack of understanding or reluctance of the respondents to answer a question that they thought was irrelevant to their business operations.

To complete the missing values, a sub-group mean value replacement function was used (J. Kaiser, 2014). After completing the missing values, the 93 questionnaires became usable. This sample size was considered adequate based on the recommendations of Marcoulides and Saunders (2006) that the minimum sample size for a study with a maximum number of 5 arrows pointing at a single latent variable should be 70. An alternative recommendation is that the minimum sample size should be equal to 10 times the largest number of structural paths directed at a particular latent construct in the structural model (Hair, Ringle, & Sarstedt, 2011). In this study, organizational mindfulness had 5 indicators (arrows), which was the highest in the study model, resulting into a minimum sample size of 50.

4.3.2 Respondent Characteristics

The respondents of the study were managers with ICT related responsibilities. They managers filled the questionnaires on behalf of the firms in which they work. The respondents were asked to identify themselves in terms of job title, the number of years they have worked as managers in ICT related responsibilities. The respondents also stated the number of years they have worked for the current organization. The respondents were further asked to classify their organizations in terms of the industry,

years the organization has been operational in Kenya and the size of the organization. With regard to cloud computing, the respondents ranked various sources of information on cloud computing on the basis of how useful they found the sources to be. Finally, the respondents identified cloud services used in their firms and the departments using those cloud services.

4.3.2.1 Job Title

This survey was administered to managers with ICT managerial positions. These positions may have different titles depending on the organization. The distribution of the respondents based on their titles was analyzed. A total of 91 managers indicated their titles with ICT manager being the most commonly used ICT managerial title. The “other” option included titles like: customer support engineer, systems administrator, network and infrastructure manager, software engineer and network administrator. This implies that organizations use different titles for managers in charge of their IT functions. This may be due to lack of standardization in the ICT sector. The frequencies of the respondents when classified by job titles are summarized in Table 4.2.

Table 4.2: Respondents Classified by Job Title

Title	Frequency	Percentage
Chief Information Technology Officer(CITO)	1	1%
ICT Manager	28	31%
Information Systems Manager	10	11%
Chief Information Officer	5	5%
Information Security Manager	5	5%
Other	42	46%
Totals	91	100%

4.3.2.2 Experience as ICT Manager

The respondents were asked to state the number of years they have worked as ICT managers. This was to compare the experiences of the various respondents in managing ICT related tasks. This was an open ended question in which the respondents were to state their experience in terms of years. The responses were then grouped into three bands during data coding. Majority of the respondents had an experience of 0-5 years (54 percent) while respondents with experience of 10 years and above were the least at 21 percent. The role of ICT in the Kenyan economy is still growing and many organizations might not have had managerial positions for the IT function. In fact, in many organizations, IT function was placed under the financial manager or operations manager. But many organizations are now creating IT managerial positions due to the critical role IT is now playing in the running of the organizations. Table 4.3 below summarizes the frequencies and percentages of respondents in terms of experience as ICT managers.

Table 4.3: Respondents' Experience as ICT Manager

Experience	Frequency	Percentage
0-5	54	62
6-10	21	24
11 and Above	12	14
Totals	87	100

4.3.2.3 Experience as ICT Manager in the Current Organization

The respondents were asked to state the number of years they have worked as ICT managers in the current organization. This was to compare the experiences of the various respondents in managing ICT related tasks in the current organization. This was an open ended question in which the respondents were to state their experience in terms of years. The responses were then grouped into three bands during data coding. A total number of 88 ICT managers responded to the question and majority of them had an experience of 0-5 years (80 percent) while respondents with experience of 11 years and above were the least at 4 percent. This is an indication that there is high turnover of ICT experts in organizations. This may be as a result of the fact that Kenya has a small pool of high end IT experts leading to high demand. Table 4.4 below summarizes the frequencies and percentages of respondents in terms of experience as ICT managers in the current organization.

Table 4.4: Experience as ICT Manager in the Current Organization

Experience	Frequency	Percentage
0-5	70	80
6-10	14	16
11 and Above	4	5
Totals	88	100

4.3.2.4 Response Rate by Industry

The study's context was selected firms in Kenya. The firms were selected from the financial, ICT and manufacturing sectors. The respondents were to select the industry to which their firms belonged. All the three industries were represented by a randomly selected sample of 60 firms each. An initial phone call to the selected firms checked if they had adopted cloud computing or not. Selected firms that indicated they had not adopted cloud computing were replaced. A total number of 92 ICT managers responded to the question. The firms in the ICT industry had the highest response frequency of 48 out of 60 resulting into a response rate of 80 percent. The manufacturing firms had the lowest response frequency of 11 out of 60 which

translated to 18 percent response rate. This was due to the fact that most of the manufacturing firms had small IT departments which were mostly headed by junior staff who either ignored the questionnaires or took too long to get authorization from their organization’s management. Table 4.5 below summarizes the frequencies and percentages of firms when classified in terms of industry.

Table 4.5: Response Rate by Industry

Industry	Mailed	Response	Response Rate(Industry)	Response Rate(Overall)
Financial	60	33	55%	18.3%
ICT	60	48	80%	26.6%
Manufacturing	60	11	18%	6.1%
Total	180	92		51%

4.3.2.5 Firm Age by Industry

In terms of firm age, the respondents were asked to state the number of years their firms have been operating in Kenya. During the coding process, firm age was organized into three bands. Those that had been in operation for 1-5 years, 6-10 years and those that had operated for more than 10 years. Over 56 percent of the firms studied have been in operation for 11 years and above while 13 percent have been in operation for 5 years and below. With regard to the firms that have operated for 11 years and above, financial institutions had the highest frequency of 22 out of a total of 49. Apart from the mobile service providers, most of the firms in the ICT sector are likely to startups. Table 4.6 gives a summary of the age of the firms according to industry.

Table 4.6: Firm Age by Industry

	<i>0-5 Years</i>		<i>6-10 Years</i>		<i>≥ 11 Years</i>		<i>Totals</i>	
	Freq.	%	Freq.	%	Freq.	%	Freq	%
ICT	8	17%	19	41%	19	41%	46	52%
Financial	1	3%	9	28%	22	69%	32	36%
Manufacturing	2	20%	0	0%	8	80%	10	11%
Totals	11	13%	28	32%	49	56%	88	100%

4.3.2.6 Firm Size

Most of the firms that responded to the questionnaire were small firms with between 1-100 employees making 55.55 percent of the total respondents. The firms with employees between 501-1000 were the least making 6.59 percent of the total respondents. The majority of respondents were from the ICT and financial sectors (Table 4.5) which are known for small numbers of employees due to automation of most of the operations. This could be the reason why firm size of 1-100 had the highest number of respondents. The high response rate by firms in the 1-100 firm size could have also been due to quick approval of requests to fill the questionnaire since they are not plagued with long bureaucratic chains. Table 4.7 presents the number of respondents by firm size.

Table 4.7: Respondents by Firm Size

Firm Size	Responses	Percentage
1-100	46	50.55
101-500	24	26.37
501-1000	6	6.59
1001 and Above	15	16.48
TOTAL	91	100.00

4.3.2.7 Sources of Cloud Computing Information

The respondents were asked to rank various sources of cloud computing information according to how the sources were useful to them in making cloud computing adoption decisions. A list of 8 main sources of cloud computing information was provided for the respondents to rank. The respondents ranked the sources from 1 indicating the most useful source and 8 referring to the least useful source. Cloud computing vendors were ranked as the most useful source of cloud computing information by 22 out of 77 respondents who answered this question. The cloud computing vendors were therefore rated as the best source of cloud computing information by 32.29 percent of the firms. This resulted into a mean score of 6.23 out of a maximum of 8.

The least ranked source of cloud computing information was the government with a mean score of 3 out of the maximum 8. Only 1 respondent out of 77 considered the government as the best source of cloud computing information. This results imply that there is still little institutional and community discourse on cloud computing. The industry associations, professional bodies and even universities have not seriously weighed in the discussions about cloud computing as a possible solution to business problems. Even the government through its agencies like Communications Authority of Kenya (CA) has not given any direction or provided regulation for the cloud computing industry. The cloud computing vendors have been left alone to push for their products with no serious source of alternative information for cloud computing consumers.

Table 4.8: Ranking of Sources of Cloud Computing Information

Sources of Cloud Information		1	2	3	4	5	6	7	8	Total	Score/8
Professional Associations' publications and conferences	Frequency	11	11	4	9	6	5	5	4	55	5.22
	Percentage	20.00%	20.00%	7.27%	16.36%	10.91%	9.09%	9.09%	7.27%		
Industry Associations' publications and conferences	Frequency	7	9	11	10	9	5	6	0	57	5.23
	Percentage	12.28%	15.79%	19.30%	17.54%	15.79%	8.77%	10.53%	0.00%		
Cloud Computing Vendors	Frequency	22	8	9	7	4	2	2	2	56	6.23
	Percentage	39.29%	14.29%	16.07%	12.50%	7.14%	3.57%	3.57%	3.57%		
Cloud Computing white papers	Frequency	7	14	7	15	4	7	5	1	60	5.32
	Percentage	11.67%	23.33%	11.67%	25.00%	6.67%	11.67%	8.33%	1.67%		
Business Consulting firms	Frequency	11	10	12	9	18	2	3	3	68	5.32
	Percentage	16.18%	14.71%	17.65%	13.24%	26.47%	2.94%	4.41%	4.41%		
Academic journals and conferences	Frequency	2	5	7	6	11	22	3	9	65	3.82
	Percentage	3.08%	7.69%	10.77%	9.23%	16.92%	33.85%	4.62%	13.85%		
Government agencies	Frequency	3	5	7	4	5	7	20	13	64	3.36
	Percentage	4.69%	7.81%	10.94%	6.25%	7.81%	10.94%	31.25%	20.31%		

Sources of Cloud Information		1	2	3	4	5	6	7	8	Total	Score/8
Government policy papers	Frequency	1	5	8	7	3	4	16	25	69	3.00
	Percentage	1.45%	7.25%	11.59%	10.14%	4.35%	5.80%	23.19%	36.23%		

4.3.2.8 Use of Cloud Computing by Business Functions

In this questionnaire item, several business operations were listed and the respondents were asked to rate the extent to which cloud computing was used to manage those operations. The list had 11 business operations and an “other” option to capture any business operation that was not on the list. E-mailing as a business operation had the highest weighted score of 3.72 out of 5 with 46.05 percent of the respondents indicating that cloud computing was used to a very large extent to manage e-mailing operations in their organizations. Payroll systems management scored the least with a weighted mean of 2.54 with 36.84 percent of the respondents indicating that they did not use cloud computing at all to manage payroll systems. The results further show that cloud computing is not widely used for human resources and financial and accounting functions. Many organizations consider financial and human resources data as confidential and due to this, they store and process such data within their premises because of perceived insecurity of cloud computing. The table 4.9 gives a summary of cloud computing use by various business functions in the respondents’ organizations.

Table 4.9: Cloud Computing Use in Business Operations

	1	2	3	4	5	Total	Weighted Average
Messaging and Collaboration	13 17.11%	5 6.58%	14 18.42%	22 28.95%	22 28.95%	76	3.46
E-mailing	14 18.42%	3 3.95%	8 10.53%	16 21.05%	35 46.05%	76	3.72
Human Resources data	28 36.84%	7 9.21%	15 19.74%	16 21.05%	10 13.16%	76	2.64
Procurement Processes	24 31.58%	9 11.84%	20 26.32%	15 19.74%	8 10.53%	76	2.66
CRM/Sales Management	19 25.00%	9 11.84%	18 23.68%	15 19.74%	15 19.74%	76	2.97

	1	2	3	4	5	Total	Weighted Average
Accounting and Finance	27 35.53%	11 14.47%	15 19.74%	11 14.47%	12 15.79%	76	2.61
Project Management	23 30.26%	11 14.47%	12 15.79%	13 17.11%	16 21.05%	75	2.84
Application Development	21 27.63%	11 14.47%	10 13.16%	16 21.05%	18 23.68%	76	2.99
Payroll system	28 36.84%	12 15.79%	15 19.74%	9 11.84%	12 15.79%	76	2.54
Data Storage	14 18.42%	5 6.58%	11 14.47%	17 22.37%	28 36.84%	75	3.53
Other.	11 14.47%	7 9.21%	10 13.16%	12 15.79%	7 9.21%	47	2.94

4.4 Principal Component Analysis, Reliability and Construct Validity

The measurement model's indicators in this study were initially purified using exploratory factor analysis (EFA) and tested for reliability and validity by running a series of tests. EFA was performed to assess construct unidimensionality and to reduce the variables into the most effective number of factors. Each of the constructs was refined using principal component analysis on the initial items comprising each construct. Following Hair et al. (2009), each principal factor extracted that had a loading of 0.5 and above was retained. Sampling adequacy measurement tests were examined using the Kaiser-Meyer-Olkins (KMO) (H. F. Kaiser, 1970), Bartlett's test of sphericity and communalities (Bartlett, 1950). All the indicators in this study were found to have a KMO measure of sampling adequacy of 0.599 and above which is considered to be suitable for factor analysis (Williams, Brown, & Onsmann, 2012). The significance level for the Bartlett's

test of sphericity of all the indicators was less than 0.05 as recommended by Williams et al. (2012).

4.4.1 Cloud Computing Vision

The cloud computing vision construct was measured using three indicators, namely; interpretation, legitimation and mobilization. The scale for each of the indicators was derived from previous studies that used them in their analysis. The indicators, also known as observed variables were treated as formative indicators during the partial least squares analysis. The scales were further reviewed for reliability and convergent validity.

The interpretation (INT) subscale consisted of six statements. The statements aimed at measuring how intelligible and informative public discourse in cloud computing has been. Each statement was rated on a five Likert type scale ranging from 1 denoting “strongly disagree” to 5 denoting “strongly agree”. The average scale rating ranged from 3.09 to 3.855 indicating that the respondent agreed that the public discourse in cloud computing is intelligible and informative. The highest rating was for the statement “the importance of cloud computing is currently clear for our organization” (SD=1.00, n=93). The statement with the lowest mean rating of 3.091 was “we as an industry have a common understanding of cloud computing” (SD= 1.16, n=93).

The legitimation subscale had 11 questionnaire statements. Each scale was rated on a five Likert type scale ranging from 1 denoting “strongly disagree” to 5 denoting “strongly agree”. The average scale rating ranged from 2.74 to 3.85 indicating that the respondents agreed that the cloud computing vendors and cloud computing entrepreneurs have tried to explain the role cloud computing in a business environment. The highest rating was for the statement “they explain how cloud computing adoption improves the quality of IT operations” (SD=0.95, n=93). The statement with the lowest mean rating of 2.74 was “they explain the legal and regulatory issues in cloud computing adoption” (SD=0.93, n=93). This indicates that cloud computing vendors and cloud computing entrepreneurs do not focus on legal and regulatory issues in their attempt to explain the role of cloud computing to business

The mobilization subscale comprised of 5 questionnaire items. Each scale was rated on a five Likert type scale ranging from 1 denoting “strongly disagree” to 5 denoting “strongly agree”. The average scale rating ranged from 3.26 to 3.63 indicating that the respondents agreed that the cloud computing vendors and cloud computing entrepreneurs have moderately promoted cloud computing adoption by organizations. The highest rating was for the statement “they provide technical and knowledge support to cloud computing adopters” (SD=0.94, n=93). The statement with the lowest mean rating of 3.26 was “they provide hardware and software resources to facilitate cloud computing adoption” (SD=1.11, n=93). This implies that the respondents felt that cloud computing vendors and cloud computing entrepreneurs have on average, provided software and hardware that facilitate cloud computing adoption. The summary of the details of the organizing vision construct are presented in Table 4.10 below.

Table 4.10: The Cloud Computing Vision Scale

<i>Item</i>	<i>N</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>Factor Loading</i>	<i>Item -Total Correlation</i>	<i>Alpha if Item Deleted</i>
Interpretation (INT)						
We as an industry have a common understanding of cloud computing.	93	3.091	1.16	0.884	0.422	0.541
Good information on cloud computing is easily available.	93	3.390	1.034	0.788	0.505	0.508
Key players in the industry continually discuss cloud computing.	93	3.247	1.044	0.747	0.458	0.528
The importance of cloud computing is currently clear to our organization.	93	3.855	0.997	0.598	0.406	0.551
So far, we have heard enough of discussions on disadvantages of cloud computing.	93	3.182	1.029	0.270	0.160	0.644
The sources of information available provide different perspectives regarding cloud computing.	93	3.610	0.934	0.223	0.163	0.637
Interpretation(INT) Scale	6	20.37	3.640			
Cronbach's Alpha of Interpretation (INT) Scale= 0.617						

<i>Item</i>	<i>N</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>Factor Loading</i>	<i>Item -Total Correlation</i>	<i>Alpha if Item Deleted</i>
Legitimation (LEG)						
They define key features and usage of cloud computing.	93	3.500	1.048	.669	.674	.885
They describe characteristics of cloud computing that are in alignment with business best practices.	93	3.526	0.961	.664	.786	.878
They describe cloud implementation success factors.	93	3.573	0.935	.658	.811	.877
The vendors discuss challenges associated with cloud innovation.	93	2.776	0.996	.708	.478	.897
They explain how cloud innovation improves the quality IT operations.	93	3.853	0.952	.585	.730	.882
They explain how cloud innovation improves the financial performance when adopted by an organization.	93	3.613	0.988	.505	.631	.888
They explain how cloud innovation improves the business performance when adopted by an organization.	93	3.800	1.000	.735	.781	.878
They advertise their long term collaboration with cloud adopters.	93	3.446	0.862	.304	.543	.892
They advertise their affiliation with influential industry level actors.	93	3.356	0.971	.576	.563	.892

<i>Item</i>	<i>N</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>Factor Loading</i>	<i>Item -Total Correlation</i>	<i>Alpha if Item Deleted</i>
They emphasize their strong reputation in the cloud innovation domain.	93	3.763	0.895	.467	.667	.886
They stress their legal and regulatory compliance	93	2.737	0.925	.506	.259	.908
Legitimation(LEG) Scale	11	37.944	7.403			
Cronbach's Alpha of legitimation (LEG) Scale= 0.897						
Mobilization (MOB)						
They provide hardware and software resources to facilitate cloud computing adoption	93	3.263	1.107	.507	.442	.862
They provide relevant training regarding cloud computing.	93	3.421	0.970	.605	.677	.791
They provide cloud computing expositions through exhibitions during industry conferences.	93	3.605	0.956	.588	.676	.792
They provide consulting services to organizations interested in adopting cloud computing.	93	3.539	0.994	.701	.724	.777
They provide technical and knowledge support to cloud computing adopters.	93	3.632	0.942	.594	.701	.785
Mobilization(MOB) Scale	5	17.460	3.866			

<i>Item</i>	<i>N</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>Factor Loading</i>	<i>Item -Total Correlation</i>	<i>Alpha if Item Deleted</i>
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Cronbach's Alpha of mobilization (MOB) Scale= 0.841

4.4.2 Institutional Forces

The institutional forces construct was measured through the three isomorphic pressures identified as coercive, mimetic and normative by DiMaggio and Powell (1983). The scale for each of the indicators was derived from previous studies that used them in their analysis, for example, Teo et al. (2003). The indicators, also known as observed variables were treated as reflective indicators during the partial least squares analysis. The scales were reviewed for reliability and convergent validity before conducting partial least squares analysis.

The mimetic pressure (MP) causes an organization to change over time to become more like other organizations in its environment. The mimetic pressure was measured using a subscale comprising four questionnaire items. The statements aimed at measuring the extent of cloud computing adoption by an organization's competitors. Each statement was rated on a five Likert type scale ranging from 1 denoting "strongly disagree" to 5 denoting "strongly agree". The average scale rating ranged from 3.05 to 3.30 indicating that the respondents moderately agreed that their competitors who have adopted cloud computing are favourably perceived by their stakeholders. The highest rating of 3.30 was for the statement "our main competitors who have adopted cloud computing have greatly benefited" (SD=1.05, n=93). This result implies that cloud computing adoption have explicit benefits. The statement with the lowest mean rating of 3.05 was "our main competitors who have adopted cloud computing are favourably perceived by their customers" (SD= 1.00, n=93). This is an indication that the respondents believed that cloud computing adoption improves the way an organization is perceived by their customers.

Coercive pressures (CP) refer to the formal or informal pressures exerted upon an organization by other organizations upon which they are dependent. Coercive pressures, as an observed indicator was measured using a scale of four items. The scale aims to capture the extent to which an organization may have adopted cloud computing as a result of pressures exerted by other organizations it depends on. These organizations may include; government agencies, industry associations and parent organization. In measuring coercive pressures, each scale was rated on a five Likert type scale ranging from 1 denoting "strongly disagree" to 5 denoting "strongly agree".

The average scale rating ranged from 2.09 to 3.50 indicating that the respondents agreed that other organizations that a firm depends on may have exerted pressure on them to adopt cloud computing. The highest rating of 3.50 was for the statement “the competitive conditions require our organization to use cloud computing” (SD=1.07, n=93). This result indicates that organizations are pushed to adopt IT innovations as a result of competitive pressures. The statement with the lowest mean rating of 2.09 was “the government requires organizations to use cloud computing” (SD=0.99, n=93). This indicates that the government has not played any role in exerting pressure on organizations to adopt cloud computing.

The normative pressures subscale had four questionnaire items. The normative pressures, according to social contagion literature, states that a focal organization with direct or indirect ties to other organizations that have adopted an innovation is able to learn about that innovation and its associated benefits and is likely also to adopt the innovation (Burt, 1987). Normative pressures were measured through a rated five point Likert type scale ranging from 1 denoting “very low” to 5 denoting “very high”. The average scale rating ranged from 2.37 to 2.67 indicating that the focal organizations with which the respondents’ organization have direct or indirect contacts had a low influence on their adoption of cloud computing. The highest rating of 2.67 was for the statement “the extent of cloud computing adoption by your firm’s customers has influenced your firm’s adoption of cloud computing” (SD=1.026, n=93). The statement with the lowest mean rating of 2.37 was “the extent to which the government’s promotion of ICT has influenced your firm to adopt cloud computing” (SD=1.04, n=93). This implies that the respondents felt that the government has not played a significant role in the adoption of cloud computing by their firms. See table 4.11 below for a summary of the entire institutional forces scale.

Table 4.11: Institutional Forces Scale

<i>Item</i>	<i>N</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>Factor Loading</i>	<i>Item -Total Correlation</i>	<i>Alpha if Item Deleted</i>
Mimetic Pressures (MP)						
Our main competitors who have adopted cloud computing have greatly benefited.	93	3.303	1.053	.684	.629	.920
Our main competitors who have adopted cloud computing are favourably perceived by others in the same industry.	93	3.158	0.945	.760	.859	.836
Our main competitors who have adopted cloud computing are favourably perceived by their customers.	93	3.053	0.999	.831	.830	.844
Our main competitors who have adopted cloud computing are favourably perceived by their suppliers.	93	3.067	1.004	.787	.781	.863
Mimetic pressures(MP) Scale	4	12.581	12.581			
Cronbach's Alpha of mimetic pressures (MP) Scale= 0.897						
Coercive Pressures (CP)						
The government requires our organization to use cloud computing.	93	2.093	0.991	.829	.524	.615

<i>Item</i>	<i>N</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>Factor Loading</i>	<i>Item -Total Correlation</i>	<i>Alpha if Item Deleted</i>
The industry association requires our organization to use cloud computing.	93	2.187	0.952	.714	.539	.609
The competitive conditions require our organization to use cloud computing.	93	3.500	1.066	.916	.318	.736
The parent organization requires all branches to use cloud computing.	93	2.573	1.190	1.144	.588	.566
Coercive pressures(CP) Scale	4	10.353				

Cronbach's Alpha of coercive pressures (CP) Scale= 0.701

Normative Pressures (NP)

The extent of cloud computing adoption by your firm's suppliers.	93	2.645	1.018	.609	.599	.704
The extent of cloud computing adoption by your firm's customers.	93	2.671	1.026	.529	.524	.742
The extent to which the government's promotion of information and communication technology influences your firm to use cloud computing.	93	2.373	1.040	.643	.577	.715
The extent to which industry or trade bodies your firm	93	2.632	1.150	.906	.598	.705

<i>Item</i>	<i>N</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>Factor Loading</i>	<i>Item -Total Correlation</i>	<i>Alpha if Item Deleted</i>
belong to has influenced the adoption of cloud computing by your firm.						
Normative pressures(NP) Scale	4	10.321	3.265			
Cronbach's Alpha of normative pressures (NP) Scale= 0.772						

4.4.3 Organizational Mindfulness

The organizational mindfulness captures an organization's flexibility and reliability in the enactment of its organizational routines. The organizational mindfulness construct was measured through its five antecedents that assess an organization's working environment. The five antecedents of organizational mindfulness are preoccupation with failure, commitment to resilience, reluctance to simplify interpretations, sensitivity to operations and underspecification of structures. The scale for each of the antecedents was derived from Dernbecher et al. (2014), Ray et al.(2011) and Wolf et al.(2009), who used organizational mindfulness in their studies. The indicators or antecedents of organizational mindfulness were treated as reflective indicators during the partial least squares analysis. The scales were reviewed for reliability and convergent validity before conducting partial least squares analysis.

The preoccupation with failure (PF) subscale captures an organization's reflective attention to the possibilities for failure bearing in mind that the process of IT innovation is itself prone to failure (Swanson & Ramiller, 2004). An organization's extent of preoccupation with failure was measured using a subscale comprising five questionnaire items. The statements aimed at measuring the extent to which the respondents agreed to the statements that measure an organization's preoccupation with failure. Each statement was rated on a five Likert type scale ranging from 1 denoting "strongly disagree" to 5 denoting "strongly agree". The average scale rating ranged from 2.21 to 3.68. The highest rating of 3.68 was for the statement "the organization treats near failures and errors as indicators of the health of our systems and try to learn from them" (SD=0.83, n=93). This result implies that the respondents agreed that how an organization treats failures and errors and thereafter learn from them is the most important indicator of preoccupation with failure as an antecedent of mindfulness. The statement with the lowest mean rating of 2.21 was "the organization focuses more on employees' failures than successes" (SD= 1.02, n=93). Generally, the respondents disagreed with the statement that their organizations focus more on their failures rather than successes.

The reluctance to simplify interpretations (RI) is a measure of how an organization actively entertains novel, diverse, and conflicting perspectives. Such a reluctance to

simplify interpretations applies to IT innovation in diverse ways (Weick, 1995). In order to capture reluctance to simplify interpretations, a five point Likert type scale was used. The scale ranged from 1 denoting “strongly disagree” to 5 denoting “strongly agree”. The average scale rating ranged from 3.33 to 3.62 indicating that the respondents generally agreed that the employees’ views are important in mindful organizations. The highest rating of 3.62 was given to the statement “employees are encouraged to express their views regarding various issues in the organization” (SD=1.03, n=93). This is an indication that mindful organizations tolerate diverse views from their employees regarding operational issues. The statement with the lowest mean rating of 3.339 was “the organization appreciates employees who express their doubts about decisions they think are not well thought out” (SD=0.97, n=93)

Sensitivity to operations (SO) is an indicator that measures an organization’s ability to attend vigilantly to small and seemingly insignificant details in its day-to-day operations. With regard to IT innovations like cloud computing, an organization’s success in its implementation will upon its sensitivity to the particulars that come to define the mutual adjustment and interaction between the innovation and the firm’s work systems (Alter, 2002). The sensitivity to operations indicator was measured using a four questionnaire items. The four questionnaire items were formulated as Likert type scale with five points ranging from 1 denoting “strongly disagree” to 5 denoting “strongly agree”. The average scale rating ranged from 3.31 to 3.69 indicating that the respondents agreed that employees’ are entirely involved in sharing various issues regarding business operations. The highest rating of 3.69 was for the statement “employees are encouraged to communicate operational anomalies as they occur” (SD=0.97, n=93). The statement with the lowest mean rating of 2.37 was “employees have access to additional resources if unexpected situations occur” (SD=1.06,n=93).

The next indicator that was used to capture the organizational mindfulness construct is commitment to resilience (CR). A mindful organization is resilient, favouring improvisation over planning, adaptation over planning and effectiveness over efficiency (Ciborra, 2002, p. 154). The commitment to resilience indicator captured an organization’s ability to adopt a practical and realistic view that acknowledges that

trade-offs between schedules, budgets and delivered functionality may need creative adjustment (Swanson & Ramiller, 2004), especially in IT innovations like cloud computing. The measurement of commitment to resilience was done using a five point Likert type scale to answer five questionnaire items. The Likert type scale ranged from 1 denoting “strongly disagree” to 5 denoting “strongly agree”. The average scale rating ranged from 3.32 to 3.71 indicating that on average, the respondents agreed that their organizations encourage improvisation and employees are given tasks from which they can learn more about different aspects of the organization. The highest rating of 3.71 was for the statement “employees are encouraged to so that the organization can continue operating in cases of anomaly” (SD=0.90, n=93). The statement with the lowest mean rating of 3.32 was “employees have a number of informal contacts that they sometimes use to solve problems occur” (SD=.89,n=93).

Mindful organizations are usually ready to relax formal structure so that authority for action can flow in times of crisis to the individuals and units having the requisite expertise to deal with the problem at hand (Swanson & Ramiller, 2004). Underspecification of structures is an indicator that measures the extent to which an organization values expertise over hierarchical rank. In order to measure underspecification of structures, a subscale consisting of five questionnaire items was used. The questionnaire items required the respondents to rate their organizations’ in terms of the extent to which they value expertise over hierarchy through a five point Likert type scale ranging from 1 denoting “strongly disagree” to 5 denoting “strongly agree”. The average scale rating ranged from 3.41 to 3.95 resulting into a mean of 3.61. This mean indicates that the respondents agreed that their organizations value expertise over hierarchy. The highest rating of 3.95 was for the statement “our employees are comfortable asking those with more expertise for help” (SD=0.87, n=93). The statement with the lowest mean rating of 3.41 was “employees in this organization value experience over hierarchical rank” (SD=1.02,n=93). Table 4.12 provides a summary of the above results.

Table 4.12: Organizational Mindfulness Scale

<i>Item</i>	<i>N</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>Factor Loading</i>	<i>Item -Total Correlation</i>	<i>Alpha if Item Deleted</i>
Preoccupation with Failure (PF)						
The organization focuses more on employees' failures than successes	93	2.216	1.024	.996	-.068	.689
The organization treats near failures and errors as indicators of the health of our systems and try to learn from them.	93	3.689	0.833	.383	.518	.347
Employees are report mistakes that could have significant consequences on our operations even if nobody notices.	93	3.541	0.887	.505	.506	.344
Employees feel free to talk to superiors about problems within their areas of operations.	93	3.662	0.947	.396	.314	.461
Employees are rewarded if they sport problems, mistakes, errors or failures within the organization.	93	2.781	1.013	.556	.344	.441
Preoccupation with failure(PF) Scale	5	15.889	2.779			
Cronbach's Alpha of coercive pressures (CP) Scale= 0.529						
Reluctance to Simplify Interpretation (RI)						
Questioning of issues is encouraged in our organization.	93	3.527	0.992	.634	3.527	0.992

<i>Item</i>	<i>N</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>Factor Loading</i>	<i>Item -Total Correlation</i>	<i>Alpha if Item Deleted</i>
Employees are encouraged to express their views regarding various issues in the organization.	93	3.622	1.039	.906	3.622	1.039
Employees' views are usually taken into account when making decisions on issues that affect them.	93	3.411	1.030	.852	3.411	1.030
The organization appreciates employees who express their doubts about decisions they think are not well informed.	93	3.338	0.947	.661	3.338	0.947
Reluctance to simplify interpretations(RI) Scale	93	13.898	3.485			
Cronbach's Alpha of reluctance to simplify interpretations (RI) Scale= 0.892						
Sensitivity to Operations (SO)						
Employees are encouraged to immediately share operational information with each other.	93	3.730	0.888	.562	.766	.859
Should problems occur within the organization, someone with the authority to act is always accessible and available.	93	3.757	0.942	.718	.839	.842
During an average day, employees come into enough contact with each other to share various issues regarding business operations.	93	3.662	0.936	.507	.649	.884
Employees have access to (additional) resources if	93	3.311	1.062	.754	.675	.881

<i>Item</i>	<i>N</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>Factor Loading</i>	<i>Item -Total Correlation</i>	<i>Alpha if Item Deleted</i>
unexpected situations occur.						
Employees are encouraged to communicate operational anomalies as they occur.	93	3.689	0.966	.678	.748	.862
Sensitivity to operations(SO) Scale	5	18.149	4.002			
Cronbach's Alpha of sensitivity to operations (SO) Scale= 0.890						
Commitment to Resilience (CR)						
Employees are committed to solve any problem that arises.	93	3.689	0.955	.512	.592	.832
Employees are encouraged to limit any negative consequences so that the organization can continue operations in case of anomalies.	93	3.716	0.903	.505	.655	.815
Employees are known for their ability to use their knowledge in novel ways.	93	3.608	0.953	.771	.841	.762
Employees have a number of informal contacts that they sometimes use to solve problems.	93	3.329	0.898	.273	.449	.866
Employees are given tasks from which they can learn more about different aspects of the operational processes	93	3.622	0.975	.728	.754	.787
Commitment to resilience(CR) Scale	5	17.964	3.689			

<i>Item</i>	<i>N</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>Factor Loading</i>	<i>Item -Total Correlation</i>	<i>Alpha if Item Deleted</i>
Cronbach's Alpha of commitment to resilience (CR) Scale= 0.847						
Underspecification of Structures (US)						
If something out of the ordinary happens, employees know who has the expertise to respond.	93	3.730	0.970	.628	.705	.809
Our employees are comfortable asking others with more expertise for help.	93	3.946	0.871	.358	.582	.840
In this organization, the people most qualified to make decisions make them.	93	3.527	0.980	.551	.625	.830
Employees in this organization value expertise over hierarchical rank.	93	3.425	0.988	.743	.753	.796
Employees in this organization value experience over hierarchical rank.	93	3.411	1.020	.686	.650	.824
Commitment to resilience(CR) Scale	5	18.038	3.829			
Cronbach's Alpha of commitment to resilience (CR) Scale= 0.851						

4.4.4 Cloud Computing Adoption

The cloud computing adoption (CCA) construct measures the use of any of the cloud computing service models by an organization. These service models include software as a service (SaaS), platform as a service (PaaS) and infrastructure as a service (IaaS). The cloud computing construct was captured by asking the respondents to rate the extent to which the various cloud computing service models have been adopted in their organizations. A single subscale comprising six questionnaire statements was used to measure cloud computing adoption by the sampled organizations. Each statement was rated on a five Likert type scale ranging from 1 denoting “no extent” to 5 denoting “very great extent”. The average scale rating ranged from 3.02 to 3.91. The highest rating of 3.91 was for the statement “virtualized resources” (SD=1.14, n=93). This result implies that the respondents’ organizations have to a great extent adopted cloud computing in the form of virtualized resources. It further implies that the organizations sampled use to a great extent IT resources that are hosted by third parties on the basis of pay-as-you-use. The statement with the lowest mean rating of 3.02 was “platform as a service (PaaS) e.g. using software development platforms like android, Windows.Net and Java that run on private or public cloud” (SD= 1.37, n=93). This response implies that of all the cloud computing services, the platform as a service (PaaS) is still being used at a moderate extent by the sampled organizations. See table 4.13 below for a summary of the measures of cloud computing adoption.

Table 4.13: Cloud Computing Adoption (CCA) Scale

<i>Item</i>	<i>N</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>Factor Loading</i>	<i>Item -Total Correlation</i>	<i>Alpha if Item Deleted</i>
Software as a Service (SaaS) e.g. using applications like Google Docs, Office 365 etc.	93	3.203	1.302	.846	.745	.793
Platform as a Service (PaaS) e.g. using software development platforms like android, Windows.Net and Java that run on private or public cloud	93	3.027	1.375	.692	.694	.804
Infrastructure as a Service (IaaS) e.g. using cloud storage services like Google drive, Dropbox, and OneDrive for storing an organization's data.	93	3.405	1.259	.791	.742	.795
Communications as a Service (CaaS) e.g. Google Gmail, VoIP, messaging, video conferencing and instant messaging (IM) based on assets owned managed and co-located by third parties.	93	3.527	1.191	.788	.717	.801
A data centre owned by the organization	93	3.685	1.267	.929	.222	.891
Virtualized resources	93	3.918	1.140	.748	.684	.808
Cloud computing adoption (CCA) Scale	6	20.765	5.658			
Cronbach's Alpha of cloud computing adoption (CCA) Scale=0.844						

4.4.5 Firm Performance

The construct of firm performance refers to an organization's operational and financial outcomes. This study adopted financial outcomes as a measure of an organization's performance. The firm performance of the sampled organizations was measured using a single scale that included a firm's revenue growth, productivity growth, market share growth and profitability growth. A subjective approach that is based on the respondents' perception was used to measure firm performance. The subjective measure was based on a five point Likert type scale questionnaire items. There were four questionnaire statements that the respondents rated using a scale ranging from 1 denoting "strongly disagree" to 5 denoting "strongly agree". The average scale rating ranged from 3.15 to 3.52. The highest rating of 3.52 was for the statement "has the productivity of your company increased since adopting cloud computing" (SD=1.12, n=93). The statement with the lowest mean rating of 3.15 was "has the turnover of your company increased since adopting cloud computing" (SD=1.07, n=93). The respondents generally agreed that adoption of cloud computing has improved their organizations' performance. Table 4.13 gives a summary of the above results.

Table 4.14: Firm Performance (FP) Scale

<i>Item</i>	<i>N</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>Factor Loading</i>	<i>Item -Total Correlation</i>	<i>Alpha if Item Deleted</i>
Has the turnover of your company increased since adopting cloud computing?	93	3.151	1.070	.923	.817	.915
Has the productivity of your company increased since adopting cloud computing?	93	3.527	1.125	1.050	.826	.913
Has the share of your organization in its most significant market increased since adopting cloud computing?	93	3.233	1.016	.842	.836	.909
Has your company been profitable since it adopted cloud computing?	93	3.301	1.060	.964	.867	.898
Firm performance (FP) Scale	4	13.212	3.885			
Cronbach's Alpha of firm performance(FP) Scale= 0.930						

4.5 Model Assessment

After the evaluation of the data quality, the partial least squares SEM algorithm was run to calculate the model's parameter estimates. The partial least squares algorithm was run using the SmartPLS 3.2.1 (Ringle et al., 2015). The model's assessment was conducted to systematically evaluate whether the hypotheses expressed by the structural model was supported by the data or not. In general, the model evaluation was conducted to determine whether the measurement model as well as the structural model fulfill the quality criteria for empirical analysis (Urbach & Ahlemann, 2010). The various criteria used for assessing partial least squares model structures were conducted in two phases following Chin (1998a). The first phase involved the assessment of the measurement model while the second phase was conducted to assess the structural model. By starting with the assessment of the outer model, the researcher can trust that the constructs, which form the basis for the assessment of the inner model relationships, are accurately measured and presented (Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014).

4.5.1 Measurement Model Assessment

Once the partial least squares algorithm had been run, the reliability and validity of the construct measures in the inner model were evaluated. The evaluation of the inner model indicators is usually done based on whether the indicators have been formulated as reflective or formative. Reflective indicators are considered "effects" of the latent variables and as such, the direction of causality is from the construct to the indicators while formative indicators are "affects" and the direction of causality is from the indicators to the construct (Urbach & Ahlemann, 2010). Given that the usage of reflective indicators is appropriate for theory testing and seem not to have epistemological, logical, and statistical problems compared to formative indicators, all the indicators in this study were formulated as reflective. Further, the use of reflective indicators is considered to be the norm in information systems research (Urbach & Ahlemann, 2010).

The study had a set of 13 indicators or observed variables. The relationships between the observed variables and their respective latent variables or constructs were specified in an outer/measurement model. The measurement model was used to define

how each block of indicators relates to their respective latent variables. The latent variables in this study were measured using single or multiple indicators. Further, each of the indicators was measured using several questionnaire items. See table 4.15 below for a summary of the study's key constructs and construct type.

Table 4.15: Constructs and their Construct Types

<i>Construct</i>	<i>Construct Type</i>	<i>Number of Indicators</i>	<i>Number of Questionnaire Items</i>
Cloud Computing Vision	Reflective	3	22
Institutional Forces	Reflective	3	12
Organizational Mindfulness	Reflective	5	24
Cloud Computing Adoption	Reflective	1	6
Firm Performance	Reflective	1	4

The constructs were conceptualized according to prior empirical studies as indicated in table 3.1. The cloud computing vision is an adaptation of the organizing vision of cloud computing. Cloud computing vision as a construct had three indicators of interpretation, legitimation, and mobilization. The institutional forces construct had mimetic pressures, coercive pressures, and normative pressures as its indicators. The five indicators of the organizational mindfulness construct included preoccupation with failure, reluctance to simplify interpretations, sensitivity to operations, commitment to resilience, and underspecification of structures. The construct of cloud computing adoption and firm performance had one indicator each.

Since all the measurement model indicators were formulated as reflective, they were tested for unidimensionality, internal consistency reliability, indicator reliability, convergent validity, and discriminant validity as recommended by both Straub et al.(2004) and Lewis et al.(2005). The tests of reliability and validity were done by conducting a confirmatory factor analysis (CFA) using SmartPLS.

4.5.1.1 Construct Unidimensionality

Construct unidimensionality was evaluated to ensure that all the measurement items for a particular construct or latent variable relate to it better than any other. After data quality of the measurement variables had been analyzed, partial least squares analysis was conducted to ensure suitability of the indicators. Table 4.16 displays the mean and standard deviation with the corresponding normality data statistics for the indicators in the outer model. From the table, the kurtosis for all the indicators is positive except for cloud computing adoption (CCA) which was negative. The skewness of all the indicators was negative except for coercive pressures and normative pressures. The absolute values for skewness and kurtosis of all the indicators were less than 2.1 (< 2.1) and 7.1 (< 7.1) respectively showing that there was no substantial departure from normality (Curran, Finch, & West, 1995).

In addition to the measures of central tendency and measures of dispersion, construct unidimensionality was assessed through the verification of the cross loading of scales and constructs to ensure that the scales loaded heavily on the relevant constructs. A bootstrapping procedure was then conducted to produce the cross loadings and the corresponding T values to test the significance of the relationships between the constructs. The bootstrapping procedure used was based on a resampling size of 500 and 300 maximum iterations. The loadings and cross loadings are presented in table D.1 in appendix D.

Table 4.16: Descriptive Statistics for Measurement Scales and Test for Univariate Normality

<i>Construct</i>	<i>Indicator</i>	<i>Number of Items</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>Kurtosis</i>	<i>Skewness</i>
Cloud Computing Vision	Interpretation(INT)	6	3.40	0.61	.835	-.420
	Legitimation(LEG)	11	3.45	0.67	1.323	-.896
	Mobilization(MOB)	5	3.49	0.77	.837	-.678
Institutional Forces	Mimetic Pressures(MP)	4	3.15	0.87	.119	-.047
	Coercive Pressures(CP)	4	2.59	0.76	.338	.262
	Normative Pressures(NP)	4	2.58	0.82	.425	.127
Organizational Mindfulness	Preoccupation with Failure(PF)	5	3.18	0.56	2.219	-.642
	Reluctance to Simplify Interpretations(RI)	4	3.47	0.87	1.406	-1.096
	Sensitivity to Operations(SO)	5	3.63	0.80	2.245	-1.300
	Commitment to Resilience(CR)	5	3.59	0.74	2.389	-1.258
	Underestimation of structures(US)	5	3.61	0.77	1.805	-.984
Cloud Adoption	Computing Cloud Computing Adoption(CCA)	1	3.46	0.94	-.235	-.476

<i>Construct</i>	<i>Indicator</i>	<i>Number of Items</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>Kurtosis</i>	<i>Skewness</i>
Firm Performance	Firm Performance(FP)	1	3.30	0.97	1.007	-.864

4.5.1.2 Construct Reliability

The construct reliability or internal consistency reliability was assessed using both Cronbach's alpha and composite reliability of the constructs. The Cronbach's alpha is the classical criterion for assessing construct reliability. Since the Cronbach's alpha assumes that all indicators the indicators are equally reliable, it severely underestimates the internal consistency reliability of latent variables in partial least squares structural equation models (Urbach & Ahlemann, 2010). To overcome this deficiency of Cronbach's alpha, composite reliability was assessed since it takes into account that indicators have different loadings. The Cronbach's alphas for all the study's constructs ranged from 0.716 to 1.000 and therefore met the above 0.600 threshold recommended by Hair et al. (2014) for partial least squares analysis. The composite reliability of all the constructs ranged from 0.841 to 1.000. These coefficients are above the recommended threshold of 0.700 (Jörg Henseler, Christian M. Ringle, & Rudolf R. Sinkovics, 2009) indicating that all the variables in the study exhibited construct reliability. See table 4.17 for details of construct reliability.

Table 4.17: Reliability of Constructs

<i>Construct</i>	<i>Cronbach's Alpha</i>	<i>Composite Reliability</i>
Cloud Computing Adoption	1	1
Cloud Computing Vision	0.774	0.864
Firm Performance	1	1
Institutional Forces	0.716	0.841
Moderating Effect 1 (Cloud Computing Vision*Organizational Mindfulness)	1	1
Moderating Effect 2 (Institutional Forces*Organizational Mindfulness)	1	1
Moderating Effect 3 (Cloud Computing Adoption*Organizational Mindfulness)	1	1
Organizational Mindfulness	0.891	0.923

4.5.1.3 Convergent Validity

The convergent validity of the outer model was assessed using the average variance extracted (AVE) as proposed by Fornell and Larcker (1981). The AVE for each latent variable was calculated by dividing the sum of the squares of each factor loading by the number of indicators. Partial least squares analysis as implemented in SmartPLS was used to calculate the values of AVE for all the constructs. The values of AVE for the latent variables ranged from 0.638 to 1.000. These values are above the minimum threshold of 0.500 and therefore imply that each latent variable is able on average to explain more than half of the variance of its indicators. Thus all the latent variables demonstrated sufficient convergent reliability. The table 4.18 below displays the AVE values of all the study's latent variables.

Table 4.18: Convergent Validity of the Measurement Model

<i>Construct</i>	<i>Original Sample (O)</i>	<i>Sample Mean (M)</i>	<i>Standard Error (STERR)</i>	<i>T Statistics (O/STERR)</i>	<i>Average Variance Extracted (AVE)</i>
Cloud Computing Adoption	1	1	0		1
Cloud Computing Vision	0.682	0.642	0.104	6.582	0.682
Firm Performance	1	1	0		1
Institutional Forces	0.638	0.628	0.061	10.452	0.638
Moderating Effect 1 (Cloud Computing Vision*Organizational Mindfulness)	1	1	0		1
Moderating Effect 2 (Institutional Forces*Organizational Mindfulness)	1	1	0		1
Moderating Effect 3 (Cloud Computing Adoption*Organizational Mindfulness)	1	1	0		1
Organizational Mindfulness	0.713	0.714	0.043	16.645	0.713

4.5.1.4 Discriminant Validity

Whereas convergent validity was assessed to test whether the particular indicator measured the construct it is supposed to measure, discriminant validity was assessed to check whether the indicators do not unintentional measure other constructs. A number of measures were used to assess the discriminant validity of the measurement model. The various measures used were the Fornell-Larcker criterion (Fornell & Larcker, 1981), cross loadings of latent variables component scores (Chin, 1998a) and Heterotrait-Monotrait (HTMT) ratio (Henseler, Ringle, & Sarstedt, 2014).

The Fornell-Larcker criterion suggests that the discriminant validity is established if a latent variable accounts for more variance in its associated indicator variables that it shares with the other constructs in the same model. Accordingly, the AVE of each latent variable should be greater than the latent variable's highest squared correlation. SmartPLS was used to generate the variance of every latent variable with its assigned indicators and with the other latent variables. Table 4.19 shows the results of the SmartPLS values generated to assess the discriminate validity using the Fornell-Larcker criterion. All the study constructs met the Fornell-Larcker criterion and were therefore deemed to have discriminant validity.

Table 4.19: Variance of Each Latent Variable with its Indicators and Other Latent Variables (Discriminant Validity)

	<i>CCA</i>	<i>CloudVision</i>	<i>FP</i>	<i>InstForces</i>	<i>ME1</i>	<i>ME2</i>	<i>ME3</i>	<i>OrgMindfulness</i>
Cloud Computing Adoption (CCA)	1							
Cloud Computing Vision (CloudVision)	0.288	0.826						
Firm Pformance (FP)	0.577	0.498	1					
Institutional Forces	0.398	0.499	0.533	0.799				

	<i>CCA</i>	<i>CloudVision</i>	<i>FP</i>	<i>InstForces</i>	<i>ME1</i>	<i>ME2</i>	<i>ME3</i>	<i>OrgMindfulness</i>
(InstForces)								
Moderating Effect 1(ME1)	-0.15	-0.332	-0.37	-0.147	1			
Moderating Effect 2(ME2)	-0.071	-0.162	-0.19	0.033	0.706	1		
Moderating Effect 3(ME3)	0.199	-0.162	-0.28	-0.069	0.537	0.539	1	
Organizational Mindfulness (OrgMindfulness)	0.446	0.554	0.66	0.345	-0.455	-0.27	-0.4	0.844

The second measure that was used to assess discriminant validity is cross loadings. The cross loadings were obtained by correlating each latent variable's component scores with all the other items. According to Chin (1998a), if each indicator's loadings are higher for its designated construct than for any of the other constructs, and each of the constructs loads highest with its assigned items, then it can be inferred that there is discriminant validity amongst the constructs. The cross loading for the study constructs were generated using SmartPLS as shown in Table 4.20. From the table, it can be seen that all the constructs had highest cross loadings on their designated indicators, thus meeting the requirement for discriminant validity.

Table 4.20: Cross Loadings of Component Scores

<i>Indicators</i>	<i>Cloud Computing Adoption</i>	<i>Cloud Computing Vision</i>	<i>Firm Performance</i>	<i>Institutional Forces</i>	<i>Moderating Effect 1</i>	<i>Moderating Effect 2</i>	<i>Moderating Effect 3</i>	<i>Organizational Mindfulness</i>
Cloud Computing Adoption (CCA)	1	0.288	0.577	0.398	-0.15	-0.071	-0.199	0.446
Coercive Pressures (CP)	0.321	0.236	0.329	0.787	0.049	0.065	-0.209	0.244
Commitment to Resilience (CR)	0.48	0.491	0.594	0.301	-0.439	-0.277	-0.454	0.894
CloudAdoption * OrgMindfulness	-0.199	-0.162	-0.281	-0.069	0.537	0.539	1	-0.401
CloudVision * OrgMindfulness	-0.15	-0.332	-0.366	-0.147	1	0.706	0.537	-0.455
Firm Performance (FP)	0.577	0.498	1	0.533	-0.366	-0.19	-0.281	0.66
Interpretation (INT)	0.239	0.824	0.404	0.336	-0.263	-0.116	-0.088	0.449
InstForces * OrgMindfulness	-0.071	-0.162	-0.19	0.033	0.706	1	0.539	-0.27
Legitimation (LEG)	0.299	0.931	0.484	0.518	-0.321	-0.151	-0.141	0.54
Mobilization (MOB)	0.118	0.707	0.312	0.369	-0.225	-0.149	-0.23	0.345
Mimetic Pressures (MP)	0.315	0.509	0.41	0.78	-0.215	0.062	0.093	0.265
Normative Pressures (NP)	0.319	0.454	0.539	0.829	-0.187	-0.048	-0.047	0.318
Preoccupation with Failure (PF)	0.296	0.18	0.384	0.31	-0.081	-0.028	0.037	0.545

<i>Indicators</i>	<i>Cloud Computing Adoption</i>	<i>Cloud Computing Vision</i>	<i>Firm Performance</i>	<i>Institutional Forces</i>	<i>Moderating Effect 1</i>	<i>Moderating Effect 2</i>	<i>Moderating Effect 3</i>	<i>Organizational Mindfulness</i>
Reluctance to Simplify Interpretations (RI)	0.301	0.493	0.575	0.293	-0.422	-0.176	-0.331	0.893
Sensitivity to Operations (SO)	0.376	0.588	0.591	0.297	-0.453	-0.282	-0.393	0.919
Underspecification of Structures (US)	0.403	0.514	0.606	0.275	-0.445	-0.315	-0.433	0.91

Due to low sensitivity of Fornell-Larcker and cross loadings criteria's low sensitivity in detecting discriminant validity, an alternative criterion called heterotrait-monotrait (HTMT) ratio was also used to assess discriminant validity. The HTMT is an estimate of the correlations of the various constructs. The HTMT values for the correlations were generated using SmartPLS. The values were all below 0.85 as recommended by Kline (2010) for determining discriminant validity. In cases where the values are higher than the threshold of 0.85, there is lack of discriminant validity. The table 4.21 shows the HTMT ratio values for the study constructs.

Table 4.21: Heterotrait-Monotrait Ratio Values for the Constructs

	<i>CCA</i>	<i>Cloud Visio n</i>	<i>FP</i>	<i>Inst Forces</i>	<i>ME1</i>	<i>ME2</i>	<i>ME3</i>	<i>OrgMin dfulnes</i>
Cloud Computing Adoption (CCA)								
Cloud Computing Vision (CloudVision)	0.3							
Firm Permance(FP)	0.577	0.548						
Institutional Forces (InstForces)	0.47	0.661	0.63					
Moderating Effect 1(ME1)	0.15	0.369	0.366	0.222				
Moderating Effect 2(ME2)	0.071	0.19	0.19	0.086	0.706			
Moderating Effect 3(ME3)	0.199	0.21	0.281	0.172	0.537	0.539		
Organizational Mindfulness (OrgMinfulness)	0.472	0.632	0.699	0.443	0.468	0.274	0.419	

4.5.1.5 Measurement Model Overall Review

The predictive relevance of the model was assessed through the use of R squared (R^2) for the endogenous variables. The R^2 values were generated using SmartPLS PLS algorithm as presented in Figure 4.1. The R^2 for the endogenous variable cloud computing adoption (CloudAdoption) was 0.273 and firm performance (FP) was 0.535. According to Chin (1998a) the values for R^2 that are approximately 0.670 are considered substantial, values around 0.333 are considered average and finally values of 0.190 and lower are considered weak. The R^2 values for the study's endogenous variables of 0.273 for CloudAdoption and FP are average and substantial respectively. The model therefore exhibited an average explanatory power.

Following the results of confirmatory factor analysis (CFA), all the subscales of the constructs had loadings that were statistically significant. The loadings of the subscales was generated using a bootstrapping (Efron, 1992) process in SmartPLS. All the subscales of all the study's constructs had loadings that were statistically significant. The cloud computing vision (CloudVision) subscales were statistically significant and had the following t-statistics; interpretation (INT) $t(499)=4.008$, $p \leq 0.05$; legitimation (LEG) $t(499)=5.294$, $p \leq 0.05$; mobilization (MOB) $t(499)=3.064$, $p \leq 0.05$.

The loadings for the various subscales for the institutional forces (InstForces) construct were also all statistically significant. The t-statistics for the various subscales of institutional forces construct were as follows; mimetic pressures (MP) $t(499)=6.977$, $p \leq 0.05$; coercive pressures (CP) $t(499)=9.127$, $p \leq 0.05$; and normative pressures (NP) $t(499)=9.083$, $p \leq 0.05$.

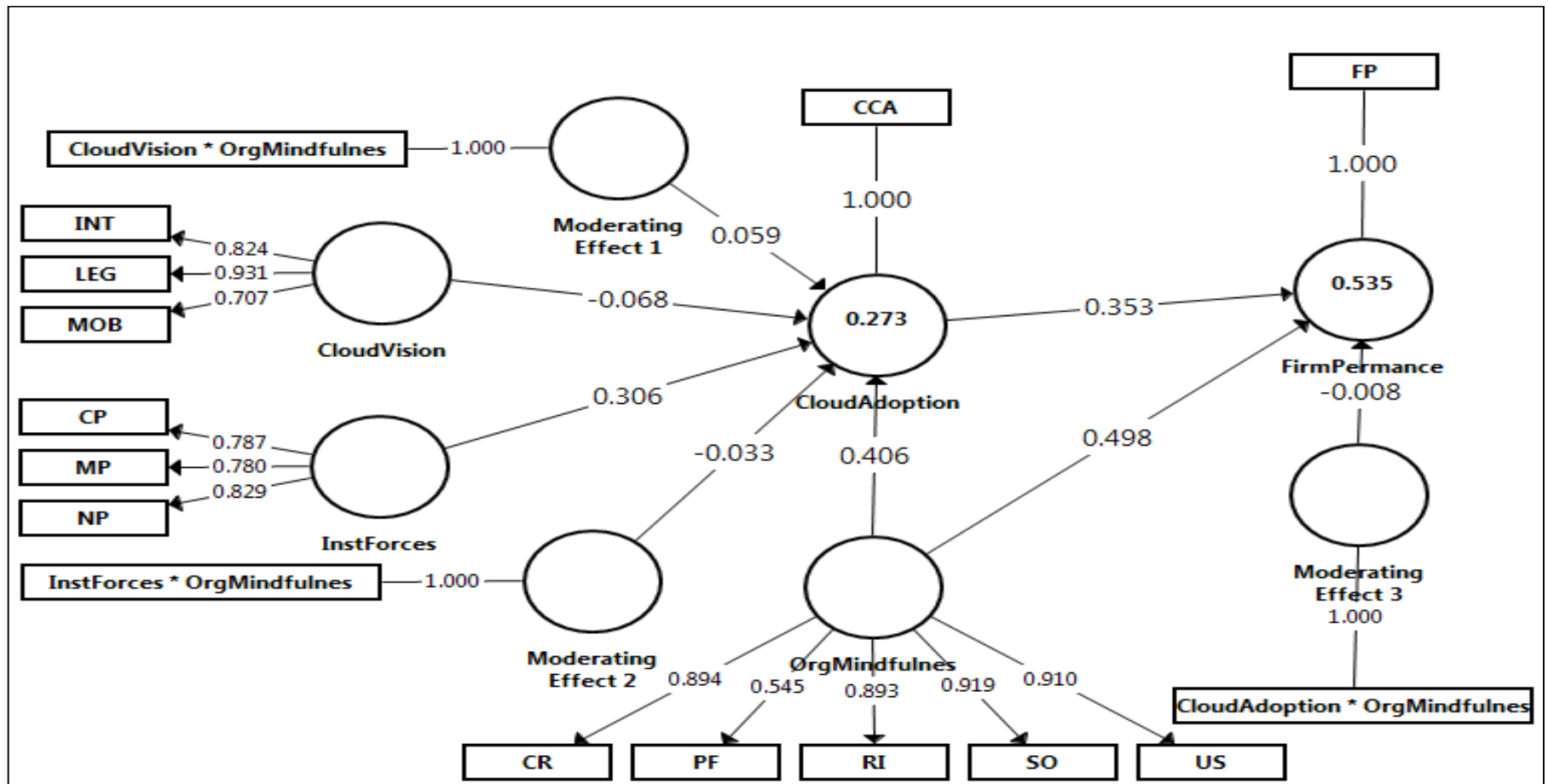
The next scales assessed were those of the organizational mindfulness (OrgMindfulness) construct. The construct had five subscales and all their t-statistics were significant. The t-statistics for the various subscales of the organizational mindfulness construct were as follows; commitment to resilience (CR) $t(499)=21.673$, $p \leq 0.05$; preoccupation with failure (PF) $t(499)=3.214$, $p \leq 0.05$; reluctance to simplify interpretation (RI) $t(499)=30.599$, $p \leq 0.05$; preoccupation with failure (PF) $t(499)=3.214$, $p \leq 0.05$; sensitivity to operations (SO) $t(499)=34.924$, $p \leq 0.05$; and

underspecification of structures (US) $t(499)=30.148, p \leq 0.05$. The cloud computing adoption (CloudAdoption) and firm performance (FP) had a single subscale each and therefore they both had t-statistics of $t(499)=0.000, p \leq 0.05$. The summary of the t-statistics of all the study constructs' subscales are shown in table 4.16. Figure 4.1 summarizes the measurement model.

Table 4.22: Outer Model Loadings and T-Statistics

	<i>Original sample (O)</i>	<i>Sample Mean (M)</i>	<i>Standard Error (STERR)</i>	<i>T Statistics (O/STERR)</i>	<i>P values</i>
CCA <- CloudAdoption	1	1	0		
CP <- InstForces	0.787	0.781	0.086	9.127	0
CR <- OrgMindfulness	0.894	0.892	0.041	21.673	0
CloudAdoption* OrgMindfulness <- Moderating Effect 3	1	1	0		
CloudVision * OrgMindfulness <- Moderating Effect 1	1	1	0		
FP <- FirmPermanence	1	1	0		
INT <- CloudVision	0.824	0.77	0.206	4.008	0
InstForces* OrgMindfulness<- Moderating Effect 2	1	1	0		
LEG <- CloudVision	0.931	0.884	0.157	5.924	0
MOB <- CloudVision	0.707	0.65	0.231	3.064	0.002
MP <- InstForces	0.78	0.766	0.112	6.977	0
NP <- InstForces	0.829	0.812	0.085	9.803	0
PF <- OrgMindfulness	0.545	0.534	0.17	3.214	0.001
RI <- OrgMindfulness	0.893	0.887	0.029	30.599	0
SO <- OrgMindfulness	0.919	0.916	0.026	34.924	0
US <- OrgMindfulness	0.91	0.909	0.03	30.148	0

Figure 4.1: The Measurement Model of the Study



4.5.2 Structural Model Estimation and Hypothesis Testing

The evaluation of the outer model confirmed that the indicators were reliable and valid measures of their constructs. The evaluation of the outer model was done first to ensure that the constructs which form the basis for the assessment of the inner model (structural model) relationships are accurately measured and represented. The inner model was assessed to evaluate its validity and the hypothesized relationships within it. Four measures were used to assess the outer model for validity. The first measure that was used is the coefficient of determination (R^2) (Chin, 1998a) which attempts to measure the explained variance of a latent variable relative to its total variance. The second criterion used to assess the inner model is the path coefficients (Huber et al. 2007 cited in Urbach and Ahlemann, 2010) which analyses the path coefficients in terms of their algebraic sign, magnitude, and significance. The third criterion that was used to assess the structural model is the effect size (f^2) for each path model. The effect size was determined by calculating the Cohen's f^2 (J. Cohen, 1988). The last criterion that was used to assess structural validity is the predictive relevance (Q^2) (Geisser, 1975; Stone, 1974) which is a measure of the predictive relevance of a block of manifest variables.

4.5.2.1 Coefficient of Determination

The coefficient of determination (R^2) criterion for evaluating structural model validity was assessed. The structural model of this study had two endogenous variables; cloud computing adoption (CloudAdoption) and firm performance (FP). The SmartPLS PLSc algorithm was used to generate the R^2 for the two endogenous variables. The R^2 value for CloudAdoption construct was 0.339 and that of FP 0.560. The R^2 value of 0.339 implies that 33.9 percent of the variation in CloudAdoption is explained by the variables cloud computing vision (CloudVision), institutional forces (InstForces) and organizational mindfulness (OrgMindfulness). The R^2 value of 0.560 is interpreted to mean that 56 percent of the variation in FP is explained by CloudAdoption and OrgMindfulness. According to Chin (1998a), R^2 values of around 0.333 shows that a model's explanatory power is average while R^2 values of 0.670 and 0.190 show that a model's explanatory power is substantial and weak respectively. The SEM figure 4.2 shows the R^2 values of the study's endogenous variables.

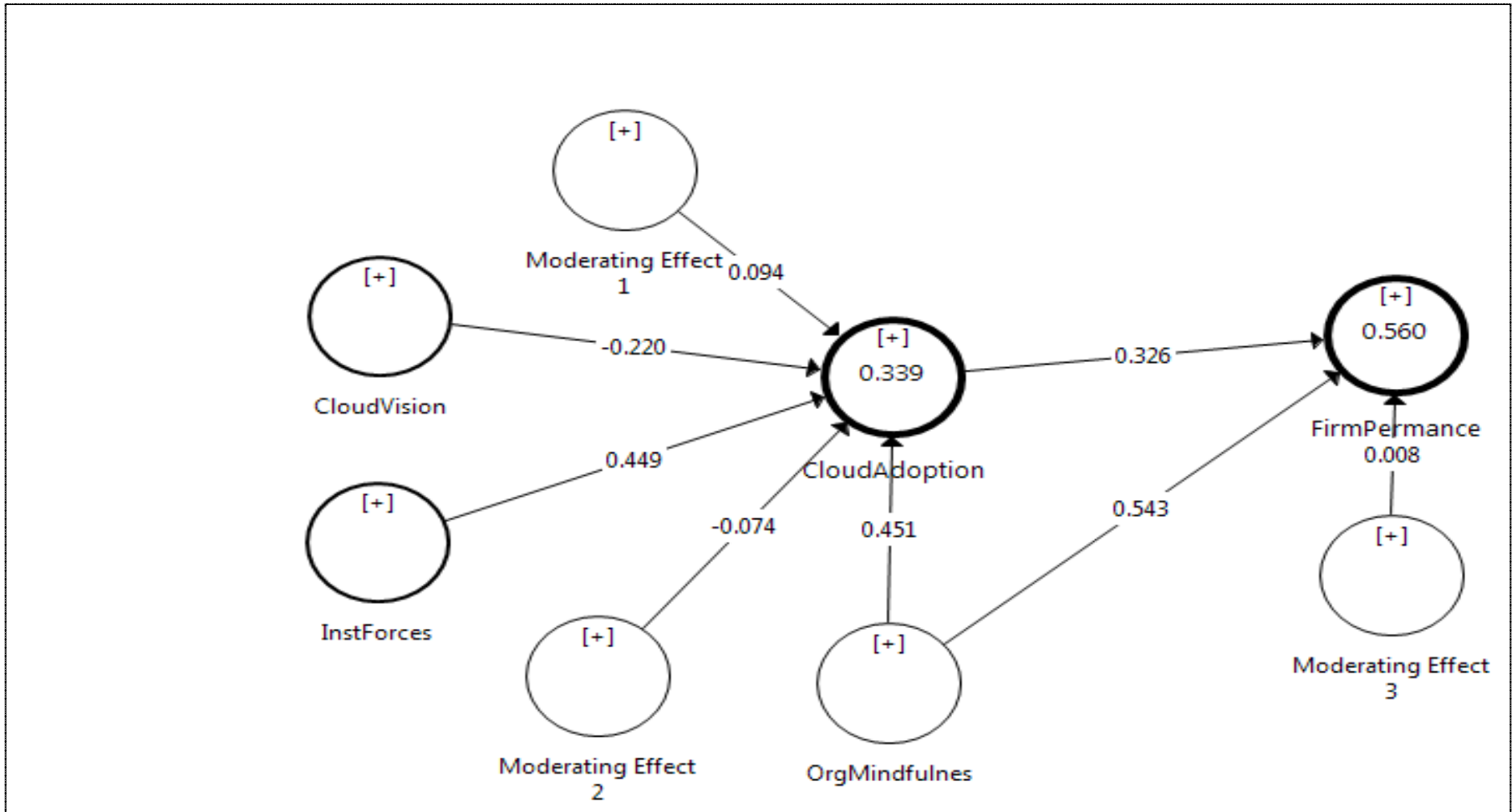


Figure 4.2: Coefficient of Determination (R Squared) of the Endogenous Variables

4.5.2.2 Path Coefficients

The structural model was evaluated using the path weightings or β coefficients and corresponding p values generated from the SmartPLS analysis. The path coefficients between the model's latent variables were checked for algebraic sign, magnitude and significance. A path coefficient's magnitude indicates the strength of the relationship between two latent variables. The path coefficients were generated using SmartPLS's consistent PLS algorithm (PLSc algorithm) instead of the common PLS algorithm. The PLSc algorithm is recommended by Dijkstra (2014) because it performs a correction of the reflective constructs' correlations to make results consistent with a factor model. After the PLSc algorithm was run, five of the study's path coefficients were above 0.100 as recommended by Huber et al. cited in Urbach and Ahlemann (2010) and therefore accounted for a certain impact within the model. The other three path coefficients were below 0.100 and therefore did not account for much impact within the model (*see table 4.17*).

Apart from the path coefficients' magnitude, the significance of the path coefficients was also assessed. In order to determine the significance of the path coefficients, the technique of bootstrapping (Helm, Eggert, & Garnefeld, 2010) was used. The bootstrapping algorithm used employed 500 subsamples and generated the T statistics and p values after running 300 iterations. From the results generated, four of the path coefficients were significant with $t \leq 1.96$ at $p \leq 0.05$. The other four path coefficients were not significant (*see table 4.18*). The structural model's path coefficients and T statistics are also represented in their SEM diagram form in figure 4.2 and figure 4.3.

Table 4.23: Latent Variables' Path Coefficients

	<i>CloudAdoption</i>	<i>FirmPerformance</i>
Cloud Computing Adoption(CloudAdoption)		0.326
Cloud Computing Vision(CloudVision)	-0.22	
Institutional Forces(InstForces)	0.449	
Moderating Effect 1 (ME1)	0.094	
Moderating Effect 2 (ME2)	-0.074	
Moderating Effect 3 (ME3)		0.008
Organizational Mindfulness (OrgMindfulness)	0.451	0.543

Table 4.24: T Statistics and P values of the Path Coefficients

	<i>Original Sample (O)</i>	<i>Sample Mean (M)</i>	<i>Standard Error (STERR)</i>	<i>T Statistics (O/STERR)</i>	<i>P Values</i>
CloudAdoption -> FirmPermanence	0.353	0.357	0.1	3.531	0
CloudVision -> CloudAdoption	-0.068	-0.04	0.142	0.478	0.633
InstForces -> CloudAdoption	0.306	0.328	0.121	2.525	0.012
Moderating Effect 1 -> CloudAdoption	0.059	0.069	0.156	0.374	0.708
Moderating Effect 2 -> CloudAdoption	-0.033	-0.047	0.163	0.201	0.841
Moderating Effect 3 -> FirmPermanence	-0.008	-0.014	0.069	0.122	0.903
OrgMindfulness -> CloudAdoption	0.406	0.368	0.142	2.848	0.005
OrgMindfulness -> FirmPermanence	0.498	0.485	0.143	3.48	0.001

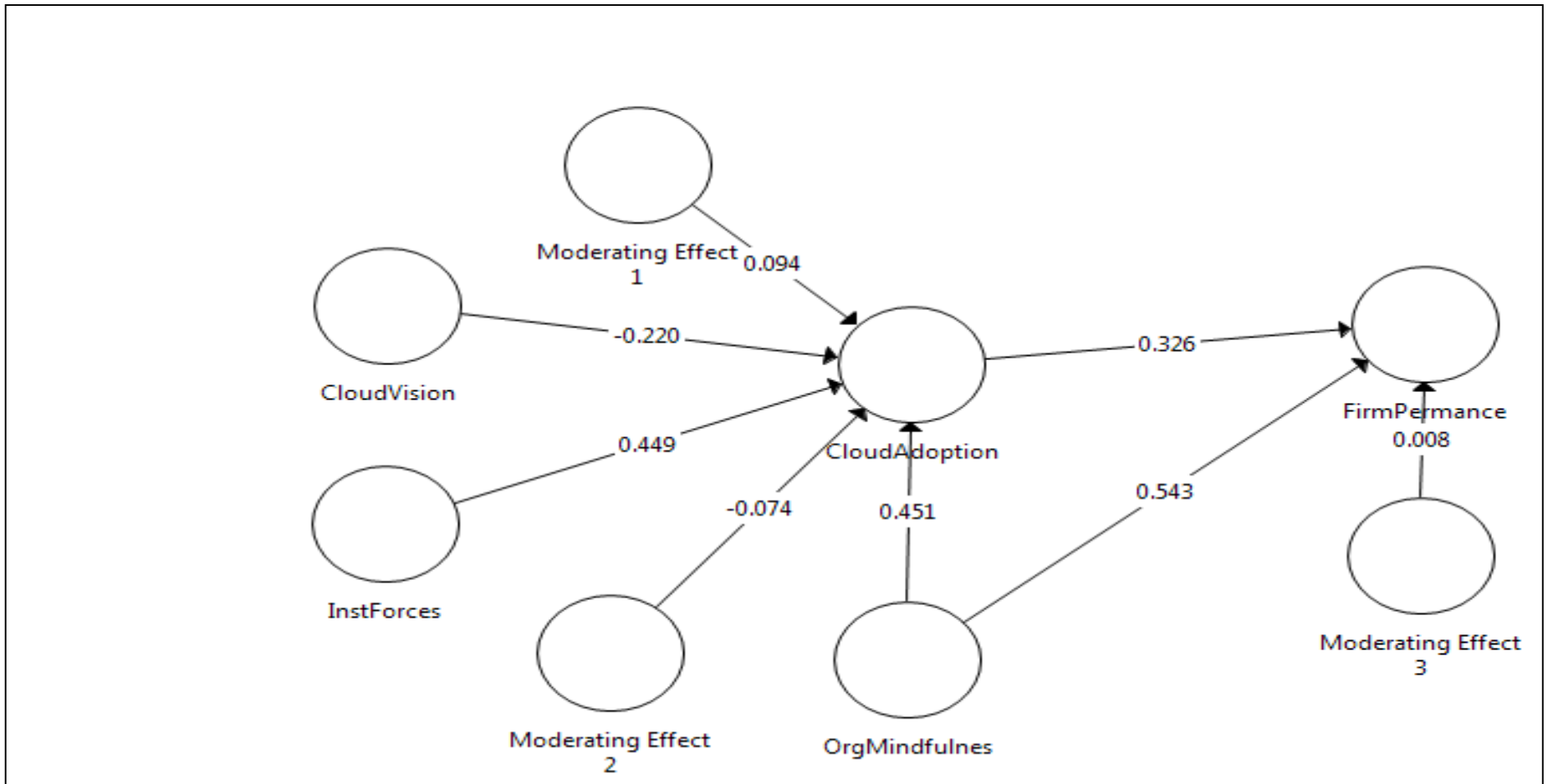


Figure 4.3: Path Coefficients of Latent Variables of the Structural Model

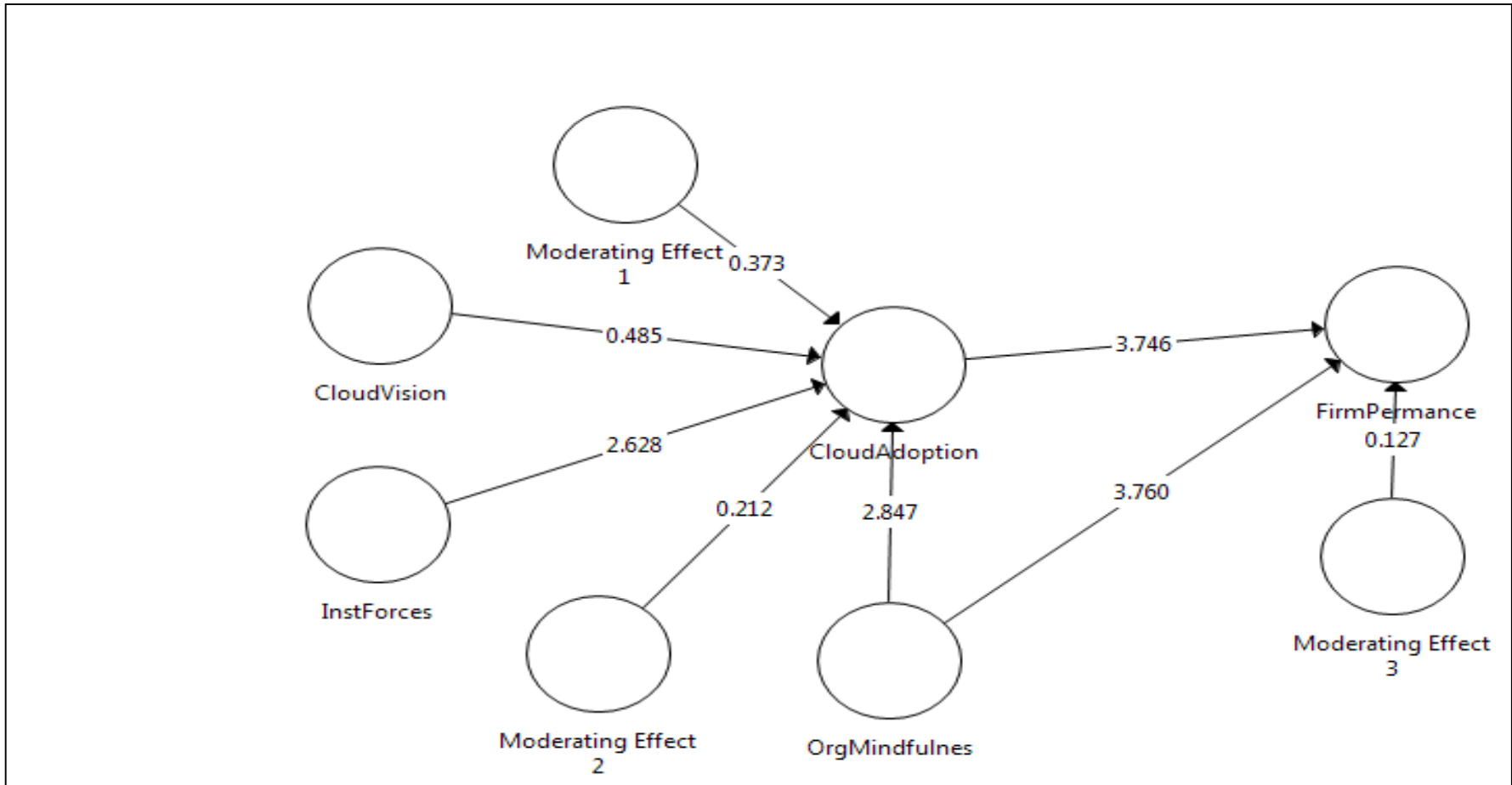


Figure 4.4: The T Statistics of the Path Coefficients of the Structural Model

4.5.2.3 Effect Size of Exogenous Constructs

The effect size of each path from an exogenous variable to an endogenous variable was evaluated using the Cohen's f^2 . The effect size is calculated as the increase in R^2 of the latent variable to which the path is connected, relative to the latent variable's proportion of unexplained variance (Chin, 1998a). The SmartPLS PLSc algorithm was used to generate the f^2 values. According to Gefen et al. (2011), f^2 values of between 0.020 and 0.150, between 0.150 and 0.350, and exceeding 0.350 indicate that an exogenous latent variable has a small, medium, or large effect on an endogenous latent variable. The results (see table 4.19) indicate that cloud computing vision had a small effect on computing adoption. Institutional forces and organizational mindfulness had a medium effect on cloud computing adoption. Cloud computing adoption had a medium effect on firm performance while organizational mindfulness had a large effect on firm performance.

Table 4.25: Effect Size (f squared) of Exogenous Variables on Endogenous Variables

	<i>CloudAdoption</i>	<i>FirmPermane</i>
Cloud Computing Adoption (CloudAdoption)		0.189
Cloud Computing Vision (CloudVision)	0.033	
Firm Performance (FirmPermane)		
Institutional Forces (InstForces)	0.171	
Moderating Effect 1	0.012	
Moderating Effect 2	0.008	
Moderating Effect 3		0
Organizational Mindfulness (OrgMindfulnes)	0.163	0.446

4.5.2.4 The Predictive Relevance of the Endogenous Variables

The last structural model validity criterion that was evaluated is the predictive relevance of the exogenous latent variables on the endogenous latent variables. This criterion was evaluated using the Stone-Geisser's Q^2 test. This test uses a blindfolding procedure to create estimates of residual variances (Tenenhaus, Vinzi, Chatelin, & Lauro, 2005). The SmartPLS blindfolding algorithm was used to generate the Q^2 values, which it does by calculating the construct cross validated redundancy. Given that the total number of observations in the study was 93 ($n=93$), the omission distance in the blindfolding setup was set to 7 following the recommendation of Hair et al.(2014, p. 167) that the omission distance should be between 5 and 7 and that the number of total observations used in the model estimation divided by the omission distance (d) is not an integer ($n \text{ mod } d \neq 0$). The Q^2 values of both cloud computing adoption and firm performance were above 0 ($Q^2 > 0$) threshold suggested by Fornell and Cha (as cited in Urbach and Uhlemann, 2010) for confirming a model's predictive relevance.

Table 4.26: Construct Cross Validated Redundancy Values

	<i>SSO</i>	<i>SSE</i>	$Q^2 = (1 - SSE/SSO)$ (<i>Exogenous Variables</i>)
Cloud computing adoption (CloudAdoption)	93	76.554	0.177
Cloud computing vision (CloudVision)	279	279	
Firm performance (FirmPermanence)	93	48.409	0.479
Institutional forces (InstForces)	279	279	
Moderating Effect 1	93	93	
Moderating Effect 2	93	93	
Moderating Effect 3	93	93	
Organizational mindfulness (OrgMindfulness)	465	465	

4.6 Hypotheses Testing

The overall objective of the study was to establish the interplay amongst cloud computing vision, cloud computing adoption, organizational mindfulness, cloud computing adoption and firm performance. The interplay amongst these constructs was represented in the form of a SEM diagram. It was hypothesized that the constructs cloud computing vision and institutional forces has a direct relationship with cloud computing adoption. It was also hypothesized that cloud computing adoption has a direct relationship with firm performance. The construct organizational mindfulness was hypothesized to be having a moderating effect on the relationships between cloud computing vision and cloud computing adoption; between institutional forces and cloud computing adoption; and finally between cloud computing adoption and firm performance.

Following the evaluation of reliability and validity of both the measurement and the structural models, a test of hypotheses was done in order to achieve the study's objectives. The hypotheses were formulated based on relevant theories and previous empirical studies. In order to test the hypotheses, partial least squares SEM as implemented in SmartPLS 3.2.1 was used. A summary of the results of the path coefficients, T statistics, level of significance and effect size are presented in Table 4.27.

Table 4.27: Relationships of the Study's Constructs

	<i>Path (β)</i>	<i>Coefficient</i>	<i>Sample Mean (M)</i>	<i>Standard Error (STERR)</i>	<i>T Statistics</i>	<i>Effect Size (f^2)</i>
CloudAdoption -> FirmPermane		0.326	0.357	0.1	3.531	0.189
CloudVision -> CloudAdoption		-0.220	-0.04	0.142	0.478	0.033
InstForces -> CloudAdoption		0.449	0.328	0.121	2.525	0.171
Moderating Effect 1 -> CloudAdoption		0.094	0.069	0.156	0.374	0.012
Moderating Effect 2 -> CloudAdoption		-0.074	-0.047	0.163	0.201	0.008
Moderating Effect 3 -> FirmPermane		0.008	-0.014	0.069	0.122	0.000
OrgMindfulnes -> CloudAdoption		0.451	0.368	0.142	2.848	0.163
OrgMindfulnes -> FirmPermane		0.543	0.485	0.143	3.48	0.446

4.6.1 Cloud Computing Vision and Cloud Computing Adoption

The first objective of this study was to establish the relationship between cloud computing vision and cloud computing adoption by the organizations in the financial, ICT and manufacturing sectors in Kenya. The literature reviewed showed that the theory of organizing vision on which the cloud computing vision construct is anchored can influence adoption of IT innovations. This objective led to the testing of the following hypothesis:

Hypothesis 1 (H1): There is a relationship between cloud computing vision and cloud computing adoption.

The cloud computing vision of an organization was considered a latent variable that could only be measured through reflective indicators. The indicators were; interpretation (INT), legitimation (LEG) and mobilization (MOB). Each of the indicators consisted of a subscale with questionnaire statements that sought to measure the cloud computing construct. The latent variable cloud computing adoption was measured using a single indicator (CCA). From table 4.21, the measures for the relationship between cloud computing vision and cloud computing adoption were $\beta = -0.220$, $t = 0.478$ and $f^2 = 0.033$. This indicates that cloud computing vision had a negative relationship with cloud computing adoption. This relationship was not significant ($t < 1.96$, $p \leq 0.05$) and the effect size (f^2) was low. The hypothesis that there is a relationship between cloud computing vision and cloud computing adoption is not supported.

4.6.2 Institutional forces and Cloud Computing Adoption

The second objective of the study was to establish the relationship between institutional forces and cloud computing adoption by the organizations in the financial, ICT and manufacturing sectors in Kenya. The literature reviewed showed that the institutional theory on which the construct of institutional forces was based has been known to be a predictor of IT innovations. This objective led to the testing of the following hypothesis:

Hypothesis 2 (H2): There is a relationship between institutional forces and cloud computing adoption.

The institutional forces construct as a latent variable was measured using three indicators. The indicators were; mimetic pressures (MP), coercive pressures (CP) and normative pressures (NP). Each of these indicators was measured through a subscale with questionnaire statements that sought to measure each of them. The latent variable cloud computing adoption was measured using a single indicator. From table 4.21, the measures for the relationship between institutional forces and cloud computing adoption were $\beta = 0.449$, $t = 2.525$ and $f^2 = 0.171$. This indicates that institutional forces had a positive relationship with cloud computing adoption. The positive relationship was significant ($t > 1.96$, $p \leq 0.05$) and the effect size (f^2) was medium. The hypothesis that there is a relationship between institutional forces and cloud computing adoption is supported.

4.6.3 Organizational Mindfulness and Cloud Computing Adoption

The third objective of the study was to establish the relationship between organizational mindfulness and cloud computing adoption by organizations in the financial, ICT and manufacturing sectors in Kenya. The literature reviewed showed that there is a need to explore the role of organizational mindfulness in IT innovation adoption. This objective led to the testing of the following hypothesis:

Hypothesis 3 (H3): There is a relationship between organizational mindfulness and cloud computing adoption.

Organizational mindfulness was measured through five reflective indicators. The indicators were; preoccupation with failure, reluctance to simplify interpretations, sensitivity to operations, commitment to resilience and underspecification of structures. The indicators for organizational mindfulness were measured using a total of 24 questionnaire statements. From table 4.21, the measures for the relationship between organizational mindfulness and cloud computing adoption were $\beta = 0.451$, $t = 2.848$ and $f^2 = 0.163$. This indicates that organizational mindfulness had a positive relationship with cloud computing adoption. The positive relationship was significant ($t > 1.96$, $p \leq 0.05$) and the effect size (f^2) was medium. The hypothesis that there is a

relationship between organizational mindfulness and cloud computing adoption is supported.

4.6.4 Cloud Computing Adoption and Firm Performance

The third objective of the study was to establish the relationship between cloud computing adoption and firm performance by organizations in the financial, ICT and manufacturing sectors in Kenya. The literature reviewed showed that IT innovation adoption leads to better firm performance. This objective led to the testing of the following hypothesis:

Hypothesis 4 (H4): There is a relationship between cloud computing adoption and firm performance.

Cloud computing adoption as a latent variable was measured using a single indicator. The indicator was the extent of cloud computing adoption. The indicator had 11 questionnaire items to identify the various cloud computing services that an organization has adopted. Firm performance was also estimated by use of a single indicator. The indicator had 4 questionnaire items to capture the perceived financial performance of a firm. From table 4.21, the measures for the relationship between cloud computing adoption and firm performance were $\beta = 0.326$, $t = 3.531$ and $f^2 = 0.189$. This indicates that cloud computing adoption had a positive relationship with firm performance. The positive relationship was significant ($t > 1.96$, $p \leq 0.05$) and the effect size (f^2) was medium. The hypothesis that there is a relationship between cloud computing adoption and firm performance is supported.

4.6.5 Organizational Mindfulness and Firm Performance

The fifth objective of the study was to establish the relationship between organizational mindfulness and firm performance by organizations in the financial, ICT and manufacturing sectors in Kenya. This objective was exploratory since the effect of organizational mindfulness on firm performance was through cloud computing adoption. One advantage of SEM is that it makes it possible to explore construct relationships that may not necessarily be supported by literature. This objective led to the testing of the following hypothesis:

Hypothesis 5 (H5): There is a relationship between organizational mindfulness and firm performance.

From table 4.21, the measures for the relationship between organizational mindfulness and firm performance were $\beta = 0.543$, $t = 3.48$ and $f^2 = 0.446$. This indicates that organizational mindfulness had a positive relationship with firm performance. The positive relationship was significant ($t > 1.96$, $p \leq 0.05$) and the effect size (f^2) was large. The hypothesis that there is a relationship between organizational mindfulness and firm performance is supported.

4.6.6 Test for the Interaction Effect of Organizational Mindfulness

The last three objectives of the study were to establish the effect of organizational mindfulness on the relationship between cloud computing vision and cloud computing adoption, between institutional forces and cloud computing adoption, and between cloud computing adoption and firm performance. The literature reviewed showed that mindful organizations take into consideration their own organizational specifics when planning to adopt an IT innovation. These objectives were achieved by analyzing the interaction effect between variables. In PLS SEM this is done by creating a new latent variable known as the latent interaction term. The indicator of the latent interaction term is generated by getting all possible pair wise products of the centred indicators of the exogenous variable and the moderator variable (Chin, Marcolin, & Newsted, 2003). The SmartPLS was used to create the latent interaction terms and their indicators through its “Add moderating effect menu”.

4.6.6.1 Test for the Interaction Effect of Organizational Mindfulness on the Relationship between Cloud Computing Vision and Cloud Computing Adoption

This objective was to test the interaction effect of organizational mindfulness on the relationship between cloud computing vision and cloud computing adoption. Using SmartPLS tool for adding a moderating effect to a model, a latent interaction variable called Moderating Effect 1 was created with the indicator being the product of the centred indicator of cloud computing vision and organizational mindfulness (CloudVision*OrgMindfulness). This objective led to the testing of the following hypothesis:

Hypothesis 6 (H6): Organizational mindfulness has a significant moderating effect on the relationship between cloud computing vision and cloud computing adoption.

From table 4.21, the measures for the moderating effect of organizational mindfulness on the relationship between cloud vision and cloud computing adoption were $\beta=0.094$, $t=0.374$ and $f^2=0.012$. This indicates that organizational mindfulness had a positive effect on the relationship between cloud computing vision and cloud computing adoption. This positive relationship was not significant ($t < 1.96$, $p \leq 0.05$) and the effect size (f^2) was very small. The hypothesis that organizational mindfulness has a significant moderating effect on the relationship between cloud computing vision and cloud computing adoption is not supported.

4.6.6.2 Test for the Interaction Effect of Organizational Mindfulness on the Relationship between Institutional Forces and Cloud Computing Adoption

This objective was to test the interaction effect of organizational mindfulness on the relationship between institutional forces vision and cloud computing adoption. Using SmartPLS tool for adding a moderating effect to a model, a latent interaction variable called Moderating Effect 2 was created with the indicator being the product of the centred indicators of institutional forces and organizational mindfulness (InstForces*OrgMinfulness). This objective led to the testing of the following hypothesis:

Hypothesis 7 (H7): Organizational mindfulness has a significant moderating effect on the relationship between institutional forces and cloud computing adoption.

From table 4.21, the measures for the moderating effect of organizational mindfulness on the relationship between cloud vision and cloud computing adoption were $\beta= -0.074$, $t=0.201$ and $f^2=0.008$. This indicates that organizational mindfulness had a negative effect on the relationship between institutional forces and cloud computing adoption. This negative effect was not significant ($t < 1.96$, $p \leq 0.05$) and the effect size (f^2) was very small. The hypothesis that organizational mindfulness has a significant moderating effect on the relationship between institutional forces and cloud computing adoption is not supported.

4.6.6.3 Test for the Interaction Effect of Organizational Mindfulness on the Relationship between Cloud Computing Adoption and Firm Performance

This objective was to test the interaction effect of organizational mindfulness on the relationship between cloud computing adoption and firm performance. Using SmartPLS tool for adding a moderating effect to a model, a latent interaction variable called Moderating Effect 3 was created with the indicator being the product of the centred indicators of cloud computing adoption and organizational mindfulness (CloudAdoption*OrgMinfulness). This objective led to the testing of the following hypothesis:

Hypothesis 8 (H8): Organizational mindfulness has a significant moderating effect on the relationship between cloud computing adoption and firm performance.

From table 4.21, the measures for the moderating effect of organizational mindfulness on the relationship between cloud computing adoption and firm performance were $\beta=0.008$, $t=0.122$ and $f^2=0.000$. This result implies that that organizational mindfulness had a very small effect on the relationship between institutional forces and cloud computing adoption. This negative effect was not significant ($t < 1.96$, $p \leq 0.05$) and the effect size (f^2) was very small. The hypothesis that organizational mindfulness has a significant moderating effect on the relationship between cloud computing adoption and firm performance is not supported.

Table 4.28: Summary of Hypotheses Testing Results

	Hypotheses	Path Coefficient	T Value	Result Summary	Empirical Conclusion
H1	There is a relationship between cloud computing vision and cloud computing adoption.	-0.220	0.478	-Negative -Not Significant	Not Supported
H2	There is a relationship between institutional forces and cloud computing adoption.	0.449	2.525	-Positive -Significant	Supported
H3	There is a relationship between organizational mindfulness and cloud computing adoption.	0.451	2.848	-Positive -Significant	Supported
H4	There is a relationship between cloud computing adoption and firm performance.	0.326	3.531	-Positive -Significant	Supported
H5	There is a relationship between organizational mindfulness and firm performance.	0.543	3.48	-Positive -Significant	Supported
H6	Organizational mindfulness has a significant moderating effect on the relationship between cloud computing vision and cloud computing adoption.	0.094	0.374	-Positive -Not significant	Not Supported
H7	Organizational mindfulness has a significant effect on the relationship between institutional forces and cloud computing adoption.	-0.074	0.201	-Negative -Not significant	Not Supported

	Hypotheses	Path Coefficient	T Value	Result Summary	Empirical Conclusion
H8	Organizational mindfulness has a significant moderating effect on the relationship between cloud computing adoption and firm performance.	0.008	0.122	-Negative -Not significant	Not Supported

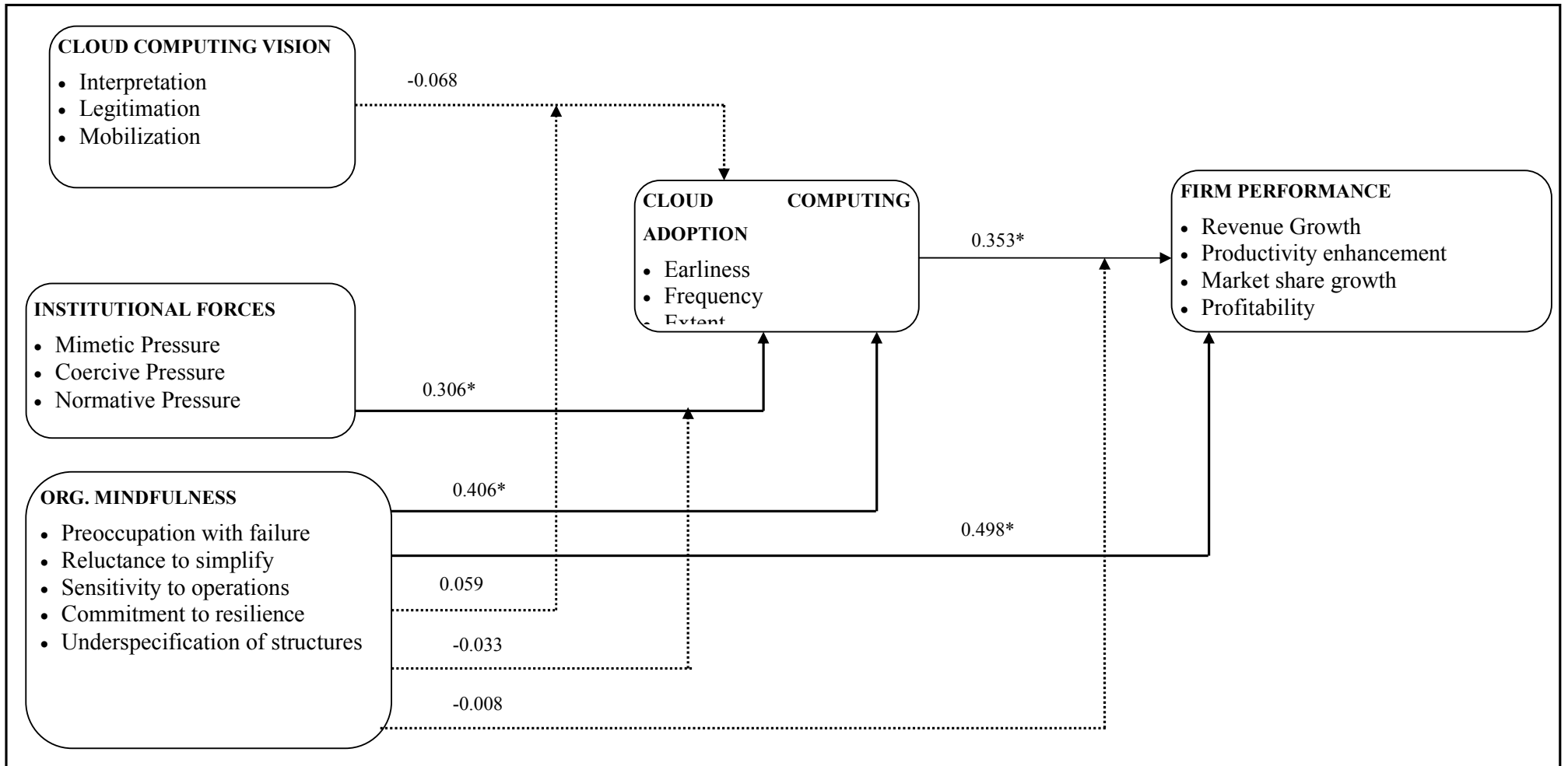


Figure 4.5: Results of the Analysis for the Theoretical Model (* p < 0.05)

CHAPTER FIVE: DISCUSSION OF FINDINGS

5.1 Introduction

The purpose of conducting research is to understand and extend the body of knowledge in a particular disciplinary domain. To this end, this section aims at discussing the results of this study in relation to extant theoretical foundations and empirical evidence on cloud computing adoption. The main objective of this study was to examine the interrelationships amongst socio-cognitive factors to cloud computing adoption and firm performance. The socio-cognitive factors, cloud computing adoption and firm performance were conceptualized as latent variables (constructs) with reflective indicators. The exogenous constructs of the study were cloud computing vision, institutional forces, and organizational mindfulness. The endogenous constructs were cloud computing adoption and firm performance. The specific objectives of the study were to establish the relationship between cloud computing vision, institutional forces, organizational mindfulness and cloud computing adoption. The study also sought to investigate the relationship between cloud computing adoption and firm performance. Additionally, the study investigated the moderating effect of organizational mindfulness on the various relationships. The findings of these specific objectives are discussed in this section.

5.2 Direct Effect of Cloud Computing Vision on Cloud Computing Adoption

The theory of organizing vision was adapted in formulating the cloud computing vision construct. The theory of the organizing vision recognizes the role played by a shared understanding of an IT innovation in its adoption. According to Swanson and Ramiller (1997), an organizing vision represents the shared understanding of the organizational application of IT innovations through the generation of community discourse. The role of the community discourse is to facilitate the interpretation, legitimation of the IT innovation by potential adopters. It further enables mobilization of the resources needed to successfully adopt the IT innovation. The grounding for a community discourse about an IT innovation is that apart from the inventor of the innovation, all the other organizations learn about a new technology from outsiders such as competitors, suppliers, customers, consultants and the universities (P. Wang, 2009).

The cloud computing vision had a very weak negative influence on cloud computing adoption ($\beta=-0.220$, $t= 0.478$ and $p\leq 0.05$). This indicates that the indicators of cloud computing adoption like interpretation, legitimation and mobilization have very weak influence on cloud computing adoption. However, the negative influence of cloud computing vision on cloud computing adoption was found not to be significant, and therefore the interpretation is not definite. The purpose of interpretation is to enable potential adopters of an IT innovation to make sense of it by creating a public theory or story that explains the innovation's existence and its purpose. Interpretation had the lowest mean of all the indicators of cloud computing vision. This implies that organizations in Kenya are still in the early stages of technical and conceptual understanding of cloud computing. While the firms studied indicated that the importance of cloud computing was clear to each of them, they stated that a common understanding of cloud computing by their respective industries was still low.

According to a study by Marsan and Pare (2013) on the adoption of open source systems (OSS), lack of clarity, consistency, and richness of discourse hinders the adoption of an IT innovation. The study also concluded that decision to adopt an innovation is positively influenced by the popularity of the innovation as a subject matter, the interest of the potential adopters and other stakeholders in the public discourse on the IT innovation. The negative influence of cloud computing vision on cloud computing adoption by organizations in Kenya can therefore be attributed to the lack of clarity, consistency and richness of cloud computing discourse in Kenya. The results show that 39.29 percent ranked cloud computing vendors at position 1 out of 8 as their main source of cloud computing information while professional associations and industry associations that should be leading in the discourse about IT innovations were ranked in position 1 out of 8 by an average 16% of the respondents (Table 4.8). Reliance on vendors as the main source of information about an innovation may lead to a lack of clarity about an innovation's purpose as a result of powerful institutional interests (Currie, 2004b)

The legitimation indicator of the cloud computing vision measured the extent to which cloud computing discourse has been linked to the business concerns. It focused on the role of cloud computing vendors, promulgators and adopters with a high reputation and authority who exert normative influence (Abrar, 2014, p. 197). The

average response to the scale items used to measure legitimation showed that the statement on how cloud providers and promulgators explain the role of cloud computing in improving the quality of IT operations was 3.85 out of 5. The least rated statement was that on the extent to which the cloud providers and promulgators explain the legal and regulatory issues in cloud computing adoption at 2.74. The negative effect on cloud computing vision on cloud computing adoption could have been contributed by the fact that the legal and regulatory issues of cloud computing adoption are not yet clear to many business organizations. A study by Wang (P. Wang, 2009) on the adoption of ERP found out that the popularity of an innovation is enhanced by the prevalence of business problems it claims to solve. The negative influence of cloud computing vision on cloud computing adoption may then be attributed to the fact that cloud vendors have focused more on the technical advantages of the innovation rather than the business advantages (Leimeister, Böhm, Riedl, & Krcmar, 2010). Additionally, despite the efforts made by vendors like IBM and HP, many IT professional do not have an in depth understanding of the cloud nor are they aware of its business benefits (Lin & Chen, 2012).

The organizing vision of a particular innovation also serves the dynamic function of helping to activate, motivate and structure the entrepreneurial and market forces (King et al., 1994) that emerge to support the material realization of the innovation. In this case, would be adopters look to the market for needed resources including hardware, software, and skills to materialize the IT innovation. The mobilization indicator had the highest overall average at 3.5 out of 5, implying that the respondents agreed that cloud computing players have moderately facilitated its adoption and the market structures relevant for cloud adoption are slowly emerging. Cloud vendors like IBM are increasingly expanding their operations in Kenya and participating in the development of skills relevant for cloud operations (IBM, 2015). A study on diverse IT innovations confirmed that materialization of an IT innovation can be activating through trade shows to enable potential adopters see its practical business applications (De Vaujany, Carton, Dominguez-Perry, & Vaast, 2012). These trade shows were used to refine the existing interpretation and inconsistencies in the innovation's organizing vision and to mobilize resources for diffusion

5.3 Direct Effect of Institutional Forces on Cloud Computing Adoption

In the institutional perspective, organizations are suspended in a web of values, norms, beliefs and taken for granted assumptions that guide and constrain their actions over time (Barley & Tolbert, 1997). These values, norms, beliefs and assumptions arise from the existence of institutions. The institutions give an organization or individuals lines of action or orientations, yet at the same time controls and constrains them (Scott, 2013). Institutions are known to exert three kinds of institutional pressures on organizations and organizational actors: coercive, mimetic and normative pressures (DiMaggio & Powell, 1983). Under institutional pressures, organizations will implement strategies in order to gain, maintain or repair their legitimacy (Suchman, 1995b) since the central underlying assumption of the institutional theory is that organizations and organizational actors seek to gain legitimacy in their environments in order to be accepted and thus ensure their long term survival (Meyer & Rowan, 1977). While many studies have looked and the risks and benefits of cloud computing, little is still known whether and to what extent institutional forces play a role in cloud computing adoption (Yigitbasioglu, 2015). This study looked at the role of institutional forces in cloud computing adoption.

Institutional forces were measured as a latent variable consisting of three indicators; mimetic pressures, coercive pressures, and normative pressures. The three institutional pressures were formulated as reflective indicators. The results showed that institutional forces had a positive influence on cloud computing adoption ($\beta=0.449$, $t= 2.525$ and $p\leq 0.05$). Further, this positive influence was found to be significant. This finding concurs with the empirical studies on the role of institutional forces in cloud computing adoption. A study by Teo et al. (2003) showed that all the institutional pressures had a significant influence on organizational intention to adopt FEDI. Institutional forces have also been found to influence top management's beliefs which in turn influence their participation in IT innovation's diffusion process (Liang et al., 2007a). The results of a literature review conducted by (El-Gazzar & Wahid, 2013) on various empirical studies on cloud computing showed that the various institutional actors; cloud computing vendors, peer organizations, business partners, professional and business associations and industry regulators played influential roles in cloud computing adoption. Recently, a study conducted to investigate the role of

institutional forces on top management also confirmed that the institutional pressures influenced managers' beliefs concerning cloud computing solutions (Yigitbasioglu, 2015).

Mimetic pressures, one of the indicators of institutional forces manifests itself in the prevalence of a practice in the focal organization's industry and the perceived success of organizations within the focal organization's industry that have adopted a practice (Haveman, 1993 as cited in Teo et al. 2003). The average of the responses for mimetic pressures was 3.14 out of 5, an indication that the respondents agreed to some extent that their competitors who have adopted cloud computing are favourably perceived by their stakeholders. The responses further indicate that an organization's peers who adopted cloud computing have benefited. These results confirm previous studies that tested the role of mimetic pressures on cloud computing adoption, for example Teo et al. (2003), Cochrane and Herhalt (2012) and Low et al. (2011). A study conducted on cloud computing adoption by South African firms also concluded that greater mimetic pressures will lead to greater adoption of cloud computing (Trope, 2014, p. 92). Going by the majority of the studies whose results show that coercive pressures influence cloud computing adoption, it can be concluded that ICT managers may adopt cloud computing not only because of rational assessment of its advantages, but also as a response to satisfy competitive pressures.

Another source of institutional forces is the coercive pressures. Coercive pressures are defined as formal or informal pressures exerted on an organization by other organizations upon which they are dependent (DiMaggio & Powell, 1983). These organizations include resource dominant organizations, regulatory bodies, and parent corporations. The average of the responses for coercive pressures was 2.58 out of 5 which indicates that the respondents agreed that coercive pressures contributed to the firms' decision to adopt cloud computing. The highest rating of 3.5 was for the statement that competitive forces contributed to the decision to adopt cloud computing by the firms sampled. The lowest rating (2.09) was for the statement that the government required firms to adopt cloud computing. This indicates that the Kenyan government has not been influential when it comes to cloud computing adoption. This may be due to the fact that the government itself has not adopted cloud computing in public sector management. Even if cloud computing has been adopted

by some public sector bodies, the initiatives are yet to enter public discourse on cloud computing. Further, the government has not been forthcoming in the formulation of relevant policies and regulations to guide cloud computing adoption.

Extant literature has noted that lack of government regulations can hinder enterprises from adopting the cloud (Lian, Yen, & Wang, 2014; Luoma & Nyberg, 2011; Nkhoma & Dang, 2013). While this study confirms the results of previous studies (Teo et al., 2003; Yigitbasioglu, 2015) that coercive pressures influence cloud computing adoption by organizations, others show that firms do not succumb to coercive pressures when making cloud computing adoption decisions (Kung, Cegielski, & Kung, 2015; Trope, 2014). This variation in results regarding the role of coercive pressures in cloud computing adoption can be attributed to the different contexts in which the studies were conducted. An implication of this is that understanding of the nature of the environment within which the firms operate and how that affects their interest in adopting cloud computing may be crucial in any cloud computing marketing efforts.

Normative pressures as a source of institutional forces manifest themselves through interorganizational channels of firm-supplier, firm-customer as well as through professional, trade, business and other key organizations (DiMaggio & Powell, 1983). Normative pressures describe mainly the effect of professional standards and the influence of professional communities on an organization (Kung et al., 2015). Normative pressures therefore capture the way in which organizations are expected to conform to standards of professionalism and to adopt systems and techniques considered to be best practices by relevant professional bodies. When normative pressures are high, organizations adopt innovations not on account of their assessments of the innovation's potential efficiency but on account of bandwagon pressure caused by the sheer number of firms that have already adopted that innovation (Abrahamson & Rosenkopf, 1993).

The average of the responses for normative pressures was 2.58 out of 5 which indicates that the respondents firms' suppliers, customers, government and industry bodies have somehow influenced their cloud computing adoption decisions. The highest rating of 2.67 was for the statement "the extent of cloud computing adoption by your firm's customers has influenced your firm's adoption of cloud computing".

This result implies that organizations in Kenya are mainly driven by the needs of their customers in making cloud computing adoption decisions and not necessarily by professional bodies. The result also implies that organizational decision makers in Kenyan organizations may be generally more customer oriented and thus more attuned to the needs of customers than suppliers. In fact, a study by Trope (2014, p. 92), after surveying firms in South Africa, found out that organizations' suppliers or the professional bodies they subscribe to did not influence their cloud computing adoption decisions. The finding of this study supports that of Basaglia et al. (2008) who found out that the main source of normative pressures is from suppliers and customers. Recently, a study on adoption of software as a service (SaaS), one of the cloud computing service models also concluded that normative pressures have a significant positive effect in the adoption of new technologies (Kung et al., 2015). This can be interpreted to mean that bandwagon effect is a significant predictor of cloud computing adoption by firms in Kenya.

5.4 Direct Effect of Organizational Mindfulness on Cloud Computing Adoption

The complex and crucial question that confronts managers of virtually all enterprises today is whether, when and how to innovate with IT. Recently, organizational mindfulness has been touted as an effective means to enable organizations attend to innovation with reasoning grounded in an organization's own facts and specifics (Fichman, 2004). Swanson and Ramiller (2004) argue that "attention to organizational specifics is crucial in supporting sound judgment about whether adopting a particular innovation is a good thing to do, when committing to the innovation is likely best to take place, and how implementation and assimilation can best be pursued". Despite several calls to investigate the interplay between organizational mindfulness and IT innovation (Fichman, 2004; Swanson & Ramiller, 2004), little has been done. The objective of this study was to investigate the influence of organizational mindfulness to cloud computing adoption, cloud computing being an IT innovation.

The results of the current study indicated that there is a positive relationship between organizational mindfulness and cloud computing adoption with a path coefficient of $\beta = 0.451$. This positive relationship was also found to be significant at $t = 2.84$, $p \leq 0.5$. All the indicators of organizational mindfulness; preoccupation with failure (PF),

reluctance to simplify interpretations (RI), sensitivity to operations (SO), commitment to resilience (CR), and underspecification of structures (US) had path coefficients of 0.581 and above. The path coefficients were also significant as follows: PF ($\beta=$, $t=2.986$ and $p\leq 0.05$), RI ($\beta= 0.775$, $t=28.379$ and $p\leq 0.05$), SO ($\beta= 0.841$, $t=35.873$ and $p\leq 0.05$), CR ($\beta=0.914$, $t= 21.002$ and $p\leq 0.05$), US ($\beta= 0.874$, $t=30.778$ and $p\leq 0.05$). These results show that all the indicators of organizational had effect on the adoption of cloud computing by the selected firms in Kenya. The selected firms therefore engaged in the early evaluation of cloud computing which resulted into the positive link between organizational mindfulness and cloud computing adoption.

Studies that investigate the relationship between organizational mindfulness and IT innovations are hard to come by. Some of these studies are conceptual and simply hypothesized the relationship this relationship, for example Fichman (2004), Swanson and Ramiller (2004); and Butler and Gray (2006). The current study therefore confirms that such a relationship exists. Further, if mindfulness is viewed as a theoretical concept for understanding how organizations can achieve flexibility and reliability in their enactment of organizational routines (Butler & Gray, 2006; Weick et al., 1999), then this study confirms the findings of McAvoy et al. (2013), who studied the influence of mindfulness on information systems development (ISD) agility. Given that the majority of the firms that responded to the study are in the ICT and financial sectors, which are competitive and turbulent in nature, they may have increased their scanning and interpretation capabilities. Rather mindful firms increase their interpretation and scanning abilities in order to operate proactively in highly turbulent markets (Teece, 2007). In the of this study, it also likely that the firms that were sampled - all of which had adopted cloud computing, they may have identified the potential of this IT innovation in meeting their varying IT resource demands at relatively lower costs as they reported improved firm performance after cloud computing adoption.

5.5 Direct Effect of Cloud Computing Adoption on Firm Performance

Many research studies have examined the relationship between IT innovation adoption and economic performance or productivity growth at the firm level. While there has been considerable debate on whether IT innovation adoption is paying off in terms of productivity growth, the results have not been conclusive. A number of studies report negative impacts during one to two years after implementation of various IT innovations (Hitt, WU, & Zhou, 2002; Nicolaou, 2004) while others reported positive impacts (Cotteleer & Bendoly, 2006; Hendricks, Singhal, & Stratman, 2007). A recent study in Kenyan banks showed that ERP systems improved the financial performance of the banks (Njihia & Mwirigi, 2014).

The impact of cloud computing on firms' performance is still an area of research which is still under-covered (Rodrigues, Ruivo, & Oliveira, 2014). This study whose results indicate that there is a positive and significant relationship between cloud computing adoption and firm performance ($\beta=0.326$, $t= 3.174$ and $p\leq 0.05$) is a contribution towards this research effort. The results of this study confirm the results of earlier studies that investigated the relationship between cloud computing adoption and firm performance. A study on the economic worth of cloud computing concluded that its adoption does provide some financial impact on the adopting firms (Nicholas-Donald, 2015). Another study on economic payoff of cloud computing indicated that cloud computing adoption announcements by firms was associated with positive increments in the market value of the firms (Son, Lee, Lee, & Chang, 2011). Hendricks et al. (2007), showed that results of profitability accruing from cloud computing adoption were stronger in the case of early adopters.

In Kenya, cloud computing studies have focused on the factors that influence adoption (Kihara & Gichoya, 2013; Kiriinya, 2014; Kituku, 2012; Omwansa et al., 2014) and not the impact of cloud computing on firm performance. This study therefore extends the nascent cloud computing adoption research in Kenya. Firm performance was measured subjectively in terms of turnover growth, productivity growth, market share growth and profitability growth. All the measures resulted into an average mean of 3.03 out of 5. This indicates that the respondents somehow agreed that cloud computing adoption improved their firm's performance. Since most of the firms started adopting cloud computing around 2010 (Omwansa et al., 2014), the

organizations that participated in this study could be said to be early adopters and therefore benefited from the first mover advantages. For examples, Dos Santos and Peffers (1995) show that banks who were earlier adopters of ATMs increased their market share and net income relative to late adopters. The firms that participated in this study were also largely mindful organizations, an attribute that could have enabled them to discern the relevance of cloud computing for their specific needs, thus improved performance.

5.6 Direct Effect of Organizational Mindfulness on Firm Performance

Mindfulness is an organizational characteristic that enables organizations to achieve reliable performance in changing environments depends on how they think (Butler & Gray, 2006). Like individual mindfulness, organizational mindfulness focuses on an organization's ability to perceive cues, interpret them, and respond appropriately. Furthermore, it is argued that organizational mindfulness provides a wider response portfolio, better process awareness and stronger accountability, which can lead to superior organizational performance (Weick et al., 1999). The current study found that there is a positive and significant relationship between organizational mindfulness and firm performance ($\beta=0.543$, $t= 3.530$ and $p\leq 0.05$). Previous studies on organizational culture concluded that there is a relationship between organizational culture and firm performance. For example, Peters and Waterman (2004) claimed that high performance firms could be distinguished from low performing firms because they possessed certain cultural traits.

A majority of the firms that participated in this study are multinationals with parent organizations based outside Kenya. It is likely that the firms adopt the cultures of their parent organizations. The cultures of the parent organizations are aimed at ensuring that the organizations survive the turbulent international markets. These firms may have therefore inherited a mindful organizational culture from the parent companies. Moreover, organizational mindfulness as an outgrowth of a dynamic capability (Wolf, Beck, & Pahlke, 2012b) may have helped the firms to cope better with uncertainty, eventually leading to above-average cloud business value generation. A study on the role of organizational mindfulness on firms' globalization and performance concluded that organizational mindfulness plays a significant role in a firm's global market performance (Bayraktar & Ndubisi, 2014).

5.7 The Interaction Effect of Organizational Mindfulness on the Relationship between Cloud Computing Vision and Cloud Computing Adoption

There is a certain overlap between organizational mindfulness and organizing vision. Interpretation is an indicator of both the constructs. While organizations apply richness of interpretation for their own organization's sense making, they also need to apply it in inter-organizational discourse (Swanson & Ramiller, 2004, p. 568) about IT innovations. Regarding cloud computing as an IT innovation, organizations apply mindfulness in terms of its interpretation attribute to understand if its adoption will be beneficial. On the other hand, organizations use organizing vision through its interpretation attribute to understand the cloud computing vision as an inter-organizational discourse about cloud computing. The firm therefore draws on the knowledge resources of the larger community as it navigates the innovation process (Attewell, 1992).

The results of this study indicate that there is an insignificant effect of organizational mindfulness on the relationship between cloud computing vision and cloud computing adoption ($\beta=0.094$, $t= 0.373$ and $p\leq 0.05$). The positive effect may be due to the fact that interpretation is an attribute of both organizational mindfulness and cloud computing vision. Furthermore, a mindful organization will make cloud adoption decisions based on its own specifics and not based on the cloud computing discourse. This is supported by the fact that despite the negative influence ($\beta=-0.220$) of cloud computing vision on cloud computing adoption, the interaction effect of organizational mindfulness on the same relationship is positive. Therefore, as an organization becomes more mindful, the effect of bandwagon dynamics on its cloud computing adoption decisions reduces. The adoption of cloud computing by firms in Kenya is therefore largely driven by the needs of the organization and not the cloud computing hype as may be manifested in cloud computing vision.

5.8 The Interaction Effect of Organizational Mindfulness on the Relationship between Institutional Forces and Cloud Computing Adoption

Organizational mindfulness is important because of the role it plays in determining organizational innovation, especially in the context of technologies subject to bandwagon dynamics. Institutional forces, which was found to have a significant positive influence on cloud computing adoption is an example of a bandwagon dynamic. In a conceptual paper, Fichman (2004) proposed that information systems researchers should investigate the role of mindfulness in IT innovation adoption with regard to its moderating effect on the traditional determinants of adoption. The current study is an effort towards that proposal. The findings of this study indicate that organizational mindfulness had a very small negative influence ($\beta=-0.074$, $t= 0.1978$ and $p\leq 0.05$) on the relationship between institutional forces and cloud computing adoption. This results implies that the greater the organizational mindfulness, the lesser the effect of institutional forces on cloud computing adoption.

Firms that are mindful are likely to resist the undue influence of institutional forces. Mindful organizations will not take generalized claims about an innovation's benefits and applicability at face value but will instead critically examine their local validity (Swanson & Ramiller, 2004). In considering adoption of any IT innovation, a mindful firm's rational will be context specific, rich in its consideration of local organizational facts, and focused on the innovation's potential contribution to the firm's distinct competence. The results of the current study confirms a study by Wolf et al. (2012b) whose results showed that rather mindful organizations are less affected by the impact of mimetic pressures on the IT innovation assimilation process compared with less mindful organizations. The small effect of mindfulness on cloud computing adoption by organizations in Kenya can be attributed to the fact that cloud computing is in the early stages of adoption. At the early stages of IT innovation adoption, bandwagon dynamics like institutional forces are strong and the organizational decision makers are increasingly subject to external dynamics in a market for information (Zucker, 1991 cited in P. Wang, 2009).

5.9 The Interaction Effect of Organizational Mindfulness on the Relationship between Cloud Computing Adoption and Firm Performance

According Swanson and Ramiller (2004), mindfulness plays a dual role in innovation, enhancing the recognition of organizational circumstances demanding an innovative response, while also fostering effectiveness in executing the response itself. This implies that even if an organization adopts an IT innovation out of bandwagon dynamics, it can still implement it mindfully for performance impacts. This is because a mindful firm will chart an implementation strategy with deliberateness, giving particular attention to the processes with which it will manage its own on-going expectations (Swanson & Ramiller, 2004). Again, in keeping with the view that mindful organizations will make better decisions throughout the innovation process, one could posit that mindfulness will moderate the link between innovation adoption and resulting performance impacts (Fichman, 2004).

The results of the study indicated that organizational mindfulness had an insignificant effect ($\beta=-0.008$, $t= 0.119$ and $p\leq 0.05$) on the relationship between cloud computing adoption and firm performance. The R squared of 0.560 means that cloud computing adoption and organizational mindfulness explains 56 percent of the variation in firm performance. This could be an explanation as to the small insignificant moderating effect of organizational mindfulness given that up to 44 percent of the variation in firm performance is not explained by other extraneous factors on which the moderating effect of organizational mindfulness could have been bigger and significant. Additionally, since the results also showed that the firms that participated in the study mindfully adopted cloud computing, mindful implementation automatically followed leading to the insignificance of mindfulness during implementation. The R squared of firm performance was 0.333 when evaluated in the absence of organizational mindfulness. It therefore means that 33.3 percent of the variation in firm performance was explained by cloud computing adoption while 22.7 percent was explained by organizational mindfulness. This implies that organizational performance accounted for the smallest variation in firm performance and thus its insignificant effect as a moderator. This study confirms Fichman's hypothesis that organizations that exhibit greater innovation mindfulness will have more beneficial impacts for any given level of innovation.

CHAPTER SIX: SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This study explored the effect of cloud computing vision, institutional forces and organizational mindfulness on cloud computing adoption. It further investigated the relationship between organizational mindfulness and cloud computing adoption on performance of selected firms in Kenya. This section presents a summary of the findings of the study and the general conclusions drawn from the findings. The implications of the study to both theory and practice of IT innovations management are then discussed. Finally, the limitations of the study are outlined and future research effort directions building on this study are proposed.

6.2 Summary of Findings

The first objective of the study was to establish the relationship between cloud computing vision and cloud computing adoption. To establish if there is a relationship, partial least squares SEM was used to test the factors of cloud computing vision and those of cloud computing adoption. The results showed that cloud computing vision has a negative and insignificant effect on cloud computing adoption ($\beta=-0.220$, $t= 0.478$ and $p\leq 0.05$). This was interpreted to mean that the cloud computing public discourse has been disjointed and inconsistent, making it difficult for adopting firms to make informed decisions. The respondents indicated that their main source of cloud computing information was cloud computing vendors. Vendors are known to present biased information and mainly focus on the strengths of their products and not the weaknesses. The negative relationship was insignificant and therefore the effect of cloud computing vision on cloud computing adoption is still open to alternative interpretations.

The second objective of the study was to establish the relationship between institutional forces and cloud computing adoption. To establish if there is a relationship, partial least squares SEM was to test the factors of institutional forces and those of cloud computing adoption. The results showed that institutional forces have a positive and significant effect on cloud computing adoption ($\beta=0.449$, $t= 2.525$

and $p \leq 0.05$). This result indicates that the institutional forces like mimetic pressures, coercive pressures and normative pressures all positively influenced cloud computing adoption by the selected firms in Kenya. The result confirmed those of various studies that investigated the role of institutional forces on IT innovation adoption.

The third objective of the study investigated the relationship between organizational mindfulness and cloud computing adoption. Partial least squares SEM was used to evaluate the proposed relationship. The results showed that institutional forces have a positive and significant effect on cloud computing adoption ($\beta=0.451$, $t= 2.848$ and $p \leq 0.05$). The organizational mindfulness attributes that include; preoccupation with failure, reluctance to simplify, sensitivity to operations, commitment to resilience and underspecification of structures were all influential in determining cloud computing adoption decisions by various firms in Kenya. The results pointed out the fact that those firms that adopted cloud computing did so after understanding their own specific needs and not necessarily because of bandwagon dynamics.

The fourth objective sought to investigate the relationship between cloud computing adoption and firm performance. Partial least squares SEM was used to evaluate this relationship. The results showed that cloud computing adoption have a positive and significant effect on firm performance ($\beta=0.326$, $t= 3.531$ and $p \leq 0.05$). The cloud computing adoption was measured through a single indicator capturing the extent of a firm's use of cloud computing. The firm performance was measured subjectively through an indicator whose scale comprised of financial aspects of firm performance. The results confirmed recent studies whose results indicated that firms that announced they had adopted cloud computing gained in terms of stock market growth.

The fifth objective of this study investigated the relationship between organizational mindfulness and firm performance. A test of hypothesis using partial least squares SEM was conducted to evaluate the relationship. The results showed that organizational mindfulness have a positive and significant effect on firm performance ($\beta=0.543$, $t= 3.48$ and $p \leq 0.05$). The results confirm that if an organization mindfully adopts cloud computing, then cloud computing positively impacts the firm's performance. Even though this objective was exploratory in this study, the results confirm those of previous studies that explored the link between mindfulness and firm performance.

The next three objectives of this study investigated the interaction effect of organizational mindfulness on the relationship between cloud computing vision and cloud computing adoption, between institutional forces and cloud computing adoption, between cloud computing adoption and firm performance. The partial least squares SEM moderated regression analysis as implemented in SmartPLS was used to evaluate the interaction effect of organizational mindfulness on the various relationships. In the sixth objective, organizational mindfulness was found to have a positive and insignificant moderating effect ($\beta=0.094$, $t= 0.374$ and $p\leq 0.05$) on the relationship between cloud computing vision and cloud computing adoption. In the seventh objective, organizational mindfulness was found to have a negative and insignificant moderating effect ($\beta=0.074$, $t= 0.201$ and $p\leq 0.05$) on the relationship between institutional forces and cloud computing adoption. Finally, in the eighth objective, organizational mindfulness was found to have a positive and insignificant moderating effect ($\beta=0.008$, $t= 0.122$ and $p\leq 0.05$) on the relationship between cloud computing adoption and firm performance.

6.3 Conclusion of the Study

The objectives of the study were achieved by testing the various hypotheses which were captured in the study's conceptual framework. In order to apply partial least squares SEM to evaluate the hypotheses, the conceptual framework was converted into a SEM model using SmartPLS model specification tools. The model was then assessed using various partial least squares SEM criteria as implemented in SmartPLS. The research focused on the role of cloud computing vision, institutional forces and organizational mindfulness on cloud computing adoption. The study also investigated the effect of cloud computing adoption on performance of selected firms in Kenya. Finally, the study examined the interaction effect of organizational mindfulness on the various relationships mentioned above.

The results of this study showed that institutional forces that manifest itself in the form of mimetic pressures, coercive pressures and normative pressures have a positive and significant influence on cloud computing adoption. The role of institutional forces in IT innovation adoption has had substantial attention in IS research. Although the focus of this study was cloud computing, the findings support various studies that explored the role of institutional theory in the adoption of IT innovations like FEDI

(Teo et al., 2003), ERPs (Benders et al., 2006; Liang et al., 2007a) and recently cloud computing (El-Gazzar & Wahid, 2013; Trope, 2014; Yigitbasioglu, 2015). The current study and the previous studies confirm that IT innovations, cloud computing included, are embedded in complex interdependent, social, political and economic networks that are shaped by broader institutional forces.

Regarding the relationship between organizational mindfulness and cloud computing, the study concluded that there is a positive and significant relationship. This study was a response to Fichman's (2004) call that IS scholars investigate the role of mindfulness in IT innovation adoption. The study confirms Fichman's hypothesis that organizational mindfulness influences IT innovation adoption. This study took the case of cloud computing as the focal IT innovation to test the hypothesis. The study confirms that mindfulness is an important attribute of organizations that operate in turbulent environments (Teece, 2007). Majority of the firms selected for this study are in the banking and ICT sectors which operate in turbulent environments resulting from stiff competition and rapidly changing technologies.

The study also concluded that there is a positive and significant relationship between cloud computing adoption and firm performance. The relationship between IT innovation adoption and firm performance has received a lot of research attention but often with varying results. The results of studies investigating the impact of IT innovation adoption on firm performance have either fallen on the IT productivity paradox axis (Dos Santos et al., 1993) or the axis that claims that IT innovation adoption has had statistically significant contribution to firm output (Brynjolfsson & Hitt, 1993). This study confirms that IT innovation adoption has positive and significant influence on firm performance. The current study also confirms the results of various studies (Nicholas-Donald, 2015; Shin, 2006; Zand, 2010) whose results confirmed that IT innovation adoption improves firm performance.

Organizational mindfulness was also found to have a positive and significant influence on firm performance. Even though there is still lack of adequate empirical studies in the IS discipline examining the relationship between organizational mindfulness and firm performance, this study confirms the results of studies conducted by Bayraktar and Ndubisi (2014); and Liozu and Hinterhuber (2013) which concluded that mindful organizations manifested relatively better firm performance.

Organizational or collective mindfulness is therefore an important aspect of organizational culture especially for financial and ICT firms that because they operate in turbulent environments.

The study found that cloud computing vision has a negative and insignificant influence on cloud computing adoption. According to Swanson and Ramiller (1997, p. 460), an organizing vision is a focal community idea for the application of an IT innovation. For this study, organizing vision was operationalized as cloud computing vision, representing the community's discourse and idea regarding the use and application of cloud computing. This community includes suppliers, competitors, cloud computing vendors, Universities, professional associations and trade organizations. The negative effect may be due to the fact that the cloud computing organizing vision in Kenya is still too at a preliminary stage to make sense.

The interaction effect of organizational mindfulness on the relationship between cloud computing vision and cloud computing adoption was found to be positive but insignificant. This implies that organizations with higher levels of organizational mindfulness have a higher likelihood of cloud computing adoption. The interaction effect of organizational mindfulness is very small and insignificant due to the fact that mindful organizations will not necessarily adopt an IT innovation. They will only adopt IT innovations that suit their organizational specifics.

Regarding the interaction effect of organizational mindfulness on the relationship between institutional forces and cloud computing adoption, the study found a negative but insignificant effect. Given that institutional forces manifest a bandwagon dynamics, mindful organizations are likely to against the grain if they find that the IT innovation in question is not relevant for the needs of their organization. More mindful organizations are less likely to succumb to the institutional pressures.

The study also found that there is a positive but insignificant interaction effect of organizational mindfulness on the relationship between cloud computing adoption and firm performance. Organizations that are mindful will leverage an IT innovation during implementation even if they adopted it through bandwagon behaviour. Mindful organizations, due to their agility and flexibility provide an environment through which IT innovation can be customized to meet the organization's needs. Due

to organizational mindfulness, an organization is able to detect errors during IT innovation implementation and use these errors or near misses as opportunities to build organizational resilience. Organizational resilience ensures that the firm's performance is not negatively affected by IT innovation failures.

6.4 Implications of the Study

The current study was initially driven by the call to IS researchers to not only theorize beyond the dominant paradigm (Fichman, 2004) but also to investigate the role of socio-cognitive factors in the adoption of IT innovations (Fichman, 2004; Ramiller & Swanson, 2003; P. Wang, 2009). This study responded to this call by using cloud computing as a focal IT innovation to investigate the role of socio-cognitive factors in IT innovation adoption and firm performance. To this effect, the current study contributes to the IS theoretical repertoire. But given that a “there is nothing as practical as a good theory” (Lewin, 1951 cited in Greenwald, 2012), this study also contributes to the management practice especially in the area of IT innovation. Most of the organizations that participated in this study operate in turbulent environments and for them to survive, they continuously seek new interpretations of the business environment. The findings of this study provide new knowledge and insights to the IT innovation adoption body of knowledge. The study will finally inform the direction of policy formulation in order for policy makers in Kenya to avail friendly environments for the adoption of IT innovations like cloud computing.

6.4.1 Theoretical Contribution

The socio-cognitive theories that were used to ground this study were: the organizing vision, institutional theory and mindfulness. The theories were used to understand and operationalize the various constructs of the study and their relationships. The constructs and their relationships were formulated into a SEM measurement and structural model. The model was then evaluated using partial least squares SEM to assess the relevance of organizing vision, institutional forces and mindfulness in understanding and explaining cloud computing adoption.

The study found out that institutional pressures have statistically significant positive influence on cloud computing adoption. The study confirms that institutional theory is still relevant for understanding and explaining IT innovation adoption by business

enterprises. All the institutional pressures had significant and positive influence on cloud computing adoption. Most of the studies that have employed institutional theory to understand IT innovation have done so in the context of developed countries, the results of this study imply that the theory's utility extends even to the developing countries. The study therefore, contributes to the generalization of institutional theory.

The study used the theory of mindfulness to formulate the construct of organizational mindfulness. Organizational mindfulness was found to have a statistically significant and positive influence on cloud computing adoption. Very few studies have investigated the role of mindfulness in explaining IT innovation adoption. This study contributes in providing more empirical evidence that the theory of mindfulness explains IT innovation adoption. The theory of mindfulness originated from organizational cognition literature and its use in understanding an IS phenomenon is an evidence of theory borrowing from the IS reference disciplines. Incorporating mindfulness into existing IT innovation research enables its theorizing to benefit from fresh new insights from other fields of inquiry (Kock, 2010).

The cloud computing vision construct was formulated from the organizing vision theory. The study found that cloud computing vision has a negative and insignificant influence on cloud computing adoption. As noted by DeSanctis, quoted in Swanson and Ramiller (1997), a lot has been written on the institutional processes surrounding IT innovation adoption, but relatively little attention has been given to the social cognition that drives innovation in new information systems. This study contributes to the IT innovation theory by validating the role of an IT innovation's organizing vision in its eventual adoption. The results of the study showed that community discourse about cloud computing is still not widespread within organizations, universities, professional bodies and industry associations in Kenya. This explains why the role of organizing vision in cloud computing adoption is not yet clear and therefore open to alternative interpretations. The study validates the view that even the early adopters of an innovation do not solely rely on their research and experience but draws on the relevant community's and elements of the organizing vision they create (Cornford & Klecun, 2002).

6.4.2 Contribution of the Study to IS Body of Knowledge

The study made a number of contributions to the IS body of knowledge. The body of knowledge in IS comprises is useful in explaining and understanding the IS artifact. The IS artifact consists of the IT artifact, information artifact and the social artifact (A. S. Lee, Thomas, & Baskerville, 2015). The current study contributes to the three components of the IS artifact and thus the IS body of knowledge. The study used three theories to explain and understand the adoption of cloud computing. The cloud computing vision was used to understand the community discourse about cloud computing thus contributing to the information artifact of IS. Cloud computing was used as the focal technology and therefore its study contributed to the IT artifact. The institutional forces contributed to the understanding of the social artifact. A model comprising cloud computing vision, institutional forces and organizational mindfulness was used to explain and understand cloud computing adoption. The model is a representation of the IS artifact that emerges from the interplay of the IT artifact, information artifact and the social artifact.

The theoretical development and empirical studies in IT innovations adoption have largely taken place in the context of developed countries. As noted by Avgerou (2008), the pace and direction of ICT innovation and concomitant organizational change are undoubtedly set by the advanced economies of the world, primarily in North America and Europe. This study complements the increasing number of studies of IT innovation experiences in other regions of the world, mainly the developing countries. This current study therefore expands the empirical basis that informs IS research findings. More significantly, the study expands the IS research field by addressing new themes like organizational mindfulness, cloud computing vision and cloud computing adoption within a developing country context.

6.4.3 Methodological Contribution

The results of this study provide some methodological implications. The study adapted the scales that had been used by previous studies to measure cloud computing vision, institutional forces, organizational mindfulness and firm performance. Despite the change of context, from developed countries to a developing country, all the scales passed validity and reliability tests. This is an indication that the scales are

reliable regardless of context and can therefore be used in future studies for collecting data across different contexts.

The operationalization of the study variables as reflective latent constructs was useful in understanding and breaking down the complex socio-cognitive constructs like cloud computing vision, institutional forces and organizational mindfulness. The use of latent variables in understanding various IS phenomena has been growing recently given that the IS artifact is socio-technical in nature. By using latent variables with reflective indicators, it was possible to make the study variables capture the day to day operations in a typical firm, making it easy for the respondents to understand the questions that were raised in the questionnaires.

The study employed the partial least squares structural equation modeling for the analysis of the data. Partial least squares SEM is widely used in IS research for simultaneously testing and estimating causal relationships among multiple independent and dependent constructs. The use of partial least squares SEM as implemented in SmartPLS made it easy to test the study's measurement and structural models. The estimates of the measurement and structural models of the study were important in interpreting the interplay amongst cloud computing vision, institutional forces, organizational mindfulness and cloud computing adoption.

6.4.4 Implication to Policy Formulation

Several studies have indicated that lack of policy frameworks is one of the inhibitors to cloud computing adoption organizations. Cloud computing raises a range of policy issues which include issues of privacy, security, anonymity, telecommunications capacity, government surveillance, reliability and liability among others (Jaeger, Lin, & Grimes, 2008). With the increasing number of organizations adopting cloud computing in Kenya, several cloud computing service providers are already pitching tent to capture the growing cloud computing market. In order to ensure a fair competition amongst the cloud computing players, a policy framework should be in place. According to a report on cloud computing in Kenya, 80 percent of the respondents said they were not aware of any policy framework on cloud computing (Omwansa et al., 2014).

The results of this study show that the government has not actively participated in the cloud computing discourse. In fact, only 4.69 percent of respondents ranked the government as their most important source of cloud computing information. The government agencies like Communications Authority (CA) charged with the responsibility of regulating the ICT market should develop relevant policies and sensitize business organizations on the various aspects of cloud computing.

The adoption of cloud computing is arguably surrounded by different levels of environmental and inter-organizational uncertainties (Cegielski, Jones-Farmer, Wu, & Hazen, 2012) which calls for government regulations at the national and international levels. The government of Kenya should borrow a leaf from countries that have enacted laws specific to cloud computing. For example, *cloud first policy* and the Health Information Technology for Economic and Clinical Health (HITECH) Act in the USA and cloud computing strategy by the Australian Government (Kushida, Murray, & Zysman, 2011). Despite cloud providers' role in ensuring secure cloud computing adoption, the lack of government regulations can hinder enterprises from cloud computing adoption.

The results of this study indicate that cloud vendors were ranked by majority of the respondents as their most important source of information (39.29 percent). To safeguard the interests of cloud consumers, it behooves the cloud computing vendors to comply with government regulations and industry standards to gain reliability and reputation among their current and potential users.

6.4.5 Implications to Management Practice

The ultimate goal of IT innovation research is to provide guidance to managers on the question of “whether, when, and how to innovate with IT” (Swanson & Ramiller, 2004). This study provides several practical implications for technology vendors, mediating institutions and adopters. The results suggest that cloud computing vendors and technology vendors in general should work closely with the government agencies, trade and professional organizations on promotional programs because these institutions possess the credibility to influence to organizational decisions on IT innovation adoption. Further, technology vendors should target the parent

organization and its subsidiaries simultaneously because they are likely to adopt at the same time to maintain a pattern of consistency.

The results of this study seem to suggest that cloud computing vendors should focus their attention on dyadic links between a potential adopter and its customers. The study showed that firms got pressure from their customers to adopt cloud computing. An organization and its customers are likely to adopt an IT innovation together to maximize their gains from using the innovation (Teo et al., 2003). Another important implication arising from this study is that cloud computing vendors should demonstrate not only the number of adoption amongst an organization's competitors but also advertise their affiliation with influential industry actors. This strategy serves the purpose of reducing managerial uncertainty pertaining to the technological innovation (Teo et al., 2003).

The adoption of IT innovations rely to a large extent on the interpretation and communication (Ramiller, 2001) on the innovation's relevance to business problematic. According to Swanson and Ramiller (2004), adopting an innovation whose interpretation is still immature and poorly communicated is the hallmark of mindlessness. The concept of mindfulness explored in this study offers an eminently practical focus for managers seeking to increase their firms' collective intelligence and responsiveness in the face of uncertainties associated with IT innovations such as cloud computing.

The role of the organizing vision of an IT innovation in determining the adoption of the innovation has been pursued in this study by using cloud computing vision to understand the organizing vision of cloud computing. One aspect through which cloud computing is manifested is the popularity of the cloud concept. As firms plan to invest or plan to invest in cloud computing, they should strive to know why cloud computing has become popular today. Discourses on the business problems and related concepts shape the focal IT innovation's popularity (P. Wang, 2009). This study challenges both practitioners and researchers to pay close attention to the cloud computing concepts and their evolution on a larger scale.

6.5 Limitations of the Study

The findings of this study should be interpreted and generalized in the light of a number of limitations. Since the study was conducted in Kenya and the sample selected from the financial, ICT and manufacturing firms; the generalizability of the results may be limited to Kenyan organizations and those firms in similar institutional contexts. This calls for caution when generalizing these results to organizations operating in different institutional and cultural contexts. The approach of sampling firms from different sectors instead of a single sector was adopted due to the fact that cloud computing adoption is still at the early stages in Kenya, making it difficult to collect adequate data from a single sector or industry.

The study used self reported data from managers with ICT related responsibilities to collect data on the various constructs of the study. The self reported were used because they are cost effective and easily implemented to large samples, especially with the advent of on-line questionnaire distribution tools like Survey Monkey. But self reports suffer from many of the same measurement artifacts as other assessment methods. Even when respondents are doing their best to be forthright and insightful, their self reports are still subject to inaccuracies. Given that cloud computing is still a new concept, even to many managers with ICT related responsibilities, some questionnaire items may have suffered from acquiescent responding and reactant responding. Acquiescent responding is used for respondents who tends to agree with statements without regard to their content while reactor responding results from indiscriminant disagreement (Paulhus & Vazire, 2007).

The analysis for this study was performed at the firm level with each firm receiving a single questionnaire to be filled by a manager with ICT related responsibilities during the data collection. This raises the question whether a single respondent can speak for an entire firm. Using one respondent may weaken the validity of the study because a single individual may not reasonably reflect the beliefs of an entire organization (Young, 1996).

According to Santos and Britto (2012), firm performance still suffers from limited conceptualization, selection of indicators based on convenience, and no proper consideration of its dimensionality despite the fact that it is an important construct in

strategic management. This study measured firm performance as a latent variable with a single indicator based on financial performance while recognizing that firm performance is a multidimensional construct. This approach may limit the understanding of the concept and over-simplify a construct that is complex. Firm performance is a multidimensional construct that should not only capture financial performance but also customer satisfaction, employee satisfaction, social performance and environmental performance. Due to the complexity of measuring firm performance as a multidimensional construct, the current study adopted the unidimensional approach following the recommendation of Ray, Barney and Muhanna (2004) that researchers use only indicators of firm performance that are directly connected to the resources under analysis.

The analysis in this study was based on cross-sectional data. The cross-sectional data was used with assumed causal flows amongst the study variables. Given that a cross-sectional surveys use retrospective and prospective data collected at a particular time raises dilemmas concerning the accuracy of measures, ability of respondents to remember or accurately project behaviours. Although cross-sectional surveys can be used to study change with retrospective and prospective data, longitudinal studies are more suited for studying change that may result from the adoption of an IT innovation like cloud computing. Cloud computing vision which captures the discourse about cloud computing by institutional members could also be accurately captured through a longitudinal study.

6.6 Suggestions for Future Research

The limitations of this study discussed above can be taken advantage of as venues for further and future research. Further research is needed to address the limitations of this study and to extent it to other IT innovations outside cloud computing. Future research can use this study as a platform to mount new areas of research efforts relevant to academics and practitioners. In order to extend the generalizability of this study, more studies of a cross-country and cross cultural nature need to be conducted. Such a research effort will enable the research community and industry to be better informed concerning the applicability of IT innovation theories under different political, institutional, economic and cultural conditions.

While a cross-sectional survey like the one employed in this study can be useful in understanding change and processes, interpreting their results depend heavily on a theoretical framework. In order to better understand constructs like cloud computing vision, institutional forces and organizational mindfulness as processes that change over time, further research should explore the use of longitudinal survey to study various IT innovation determinants and antecedents. Granted that longitudinal surveys are not the panacea to measurement challenges in IS research, the longitudinal survey represents a logical extension of the cross-sectional study and provides a useful approach for studying change and adaptation in IS domains (Venkatesh & Vitalari, 1991).

The current study operationalized firm performance as a unidimensional construct with a single indicator measuring financial performance. This approach does not capture the interests of various stakeholders like customers and employees. Further research effort that extends this study by taking into account the multidimensional nature of firm performance is required. Such a study can adopt the stakeholder theory as a lens to understanding firm performance as recommended by Santos and Brito (2012). Under the stakeholder theory conceptualization involves identifying the stakeholders and defining the set of performance outcomes that measure their satisfaction. Firm performance has been singled out because it is one of the most relevant and usually used as the final dependent variable in strategic management research (Richard, Devinney, Yip, & Johnson, 2009b).

In this study, cloud computing has been treated as an innovation. But on the other hand, cloud computing can also be seen as an innovation-enabling technology (Gasser, 2014). Future studies could consider enhancing our understanding of the role of cloud computing as an innovation-enabling technology especially how cloud computing is enabling entrepreneurs to compete in industries and markets where large IT capital investments have been an impediment. Furthermore, not all the “cloud service providers” owns and operates a data centre. Many of them are intermediary service providers or more specifically, cloud service brokers. Further studies should explore the role played by cloud brokerage service companies and the value they add in the cloud value chain. A number of uncertainties in law and policy are perceived as inhibitors to cloud growth and to the ability of the adopters to use it innovatively. Key

amongst these uncertainties in law and policy include jurisdiction (especially with regards to data privacy), compliance, transparency, service level agreements and trade policy (Gasser, 2014). Since this study and other extant studies have not adequately addressed the challenge of regulation and compliance in cloud computing, future studies should aim at informing the relevant policies on this matter both at the national and international levels.

Cloud computing offerings have been positioned as services in the form of XaaS where X is any of the offerings including but not limited to Software (SaaS), Platform (PaaS) and Infrastructure (IaaS). While some studies, like Buyya et al., (2009) have compared cloud computing “service” model with other technologies based on the service model, for example electricity, emerging studies should investigate how service value models (Ruiz, Glemier, Washburn, & Carrion, 2008) can be used to explain perceptions of cloud computing value and how it is measured within the context of various industries (Padilla, Milton, & Johnson, 2015). A starting point for such an investigation would be the integration of service value literature into cloud computing adoption research.

The current study employed organizing vision, institutional forces and organizational mindfulness to understand cloud computing adoption. Future studies, in a bid to extend the generalizability of the findings of this study can explore the role of other socio-cognitive approaches to cloud computing adoption. Possible socio-cognitive theories that can be investigated include social contagion (Greve, 1995), managerial fads and fashions (Strang & Macy, 2001); and power and trust (Hart & Saunders, 1997). While this study has explored the role of institutional forces in cloud computing adoption, future studies need to explore the process of institutionalization especially in the context of IT innovation. This will help IS researchers understand the co-evolution of technology (Weerakkody et al., 2009) and how technologies embedded in complex interdependent social, economic, and political networks and how they are consequently shaped by broader institutional influences (Orlikowski & Barley, 2001).

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APPENDIX A: THE QUESTIONNAIRE

This questionnaire is aimed at collecting data on cloud computing vision, institutional forces, organizational mindfulness, cloud computing adoption and firm performance by organizations in Kenya.

PART ONE: GENERAL INFORMATION

1.1 Respondent Details

a) What is your job Title? Tick the one that applies.

Job Title	Tick(√)
Chief Information Technology Officer	
Information and Communication Technology(ICT) Manager	
Information Systems Manager	
Chief Information Officer (CIO)	
Information Security Manager	
Other (specify).....	

b) How long have you worked in the ICT industry? (Indicate in years)

.....

c) How long have you worked in the current organization? (Indicate in years)

.....

1.2 Organizational Information

a) Name of the organization

b) Location.....

c) Classify your organization according to industry. Tick the one that applies.

Industry	Tick(√)
Information and Communications Technology (ICT)	
Money, Banking and Finance	
Manufacturing	

d) How long has this organization been operational in Kenya? (Indicate in years)

.....

e) Specify the size of your organization in terms of the number of employees.

.....

PART TWO: CLOUD COMPUTING VISION

2.1 The following are sources of information on cloud computing. Rank them according to the order of usefulness as a source of cloud computing information for your organization. Rank from 1 (most useful) to 13 (least useful).

Source	Rank
Professional associations' publications	
Professional associations' conferences	
Industry associations' publications	
Industry associations' conferences	
Print media	
Electronic media	

Cloud computing vendors	
Cloud Computing white papers	
Consulting firms	
Academic conferences	
Academic Journals	
Government agencies	
Government policy papers	

2.2 To what extent do you agree with the following statements regarding how intelligible and informative public discourse in cloud computing is?

Use the scale where 1=strongly disagree, 2=disagree, 3=undecided, 4=agree, 5=strongly agree. Tick appropriately.

	Factor	Factor Statement	Extent				
			1	2	3	4	5
1	INT1	We as an industry have a common understanding of cloud computing.					
2	INT2	Good information on cloud computing is easily available.					
3	INT3	Key players in the industry discuss cloud computing.					
4	INT4	The importance of cloud computing is currently clear to our organization.					
5	INT5	So far, we have heard enough of discussions on disadvantages of cloud computing.					
6	INT6	The sources of information available provide different perspectives regarding cloud computing.					

2.3 To what extent do you agree with the following statements regarding how cloud computing vendors and cloud computing entrepreneurs have been explaining the role of cloud computing in a business environment?

Use the scale where 1=strongly disagree, 2=disagree, 3=undecided, 4=agree, 5=strongly agree. Tick appropriately.

	Factor	Factor Statement	Extent				
			1	2	3	4	5
1	LEG1	They define key features and usage of cloud computing.					
2	LEG2	They describe characteristics of cloud computing that are in alignment with business best practices.					
3	LEG3	They describe cloud implementation success factors.					
4	LEG4	The vendors discuss challenges associated with cloud innovation.					
5	LEG5	They explain how cloud innovation improves the quality IT operations.					
6	LEG6	They explain how cloud innovation improves the financial performance when adopted by an					

		organization.					
7	LEG7	They explain how cloud innovation improves the business performance when adopted by an organization.					
8	LEG8	They advertise their long term collaboration with cloud adopters.					
9	LEG9	They advertise their affiliation with influential industry level actors.					
10	LEG10	They emphasize their strong reputation in the cloud innovation domain.					
11	LEG11	They stress their legal and regulatory compliance					

2.4 To what extent do you agree with the following statements regarding how cloud computing vendors and cloud computing entrepreneurs have been promoting cloud computing adoption?

Use the scale where 1=strongly disagree, 2=disagree, 3=undecided, 4=agree, 5=strongly agree.

	Factor	Factor Statement	Extent				
			1	2	3	4	5
1	MOB1	They provide hardware and software resources to facilitate cloud computing adoption					
2	MOB2	They provide relevant training regarding cloud computing.					
3	MOB3	They provide cloud computing expositions through exhibitions during industry conferences.					
4	MOB4	They provide consulting services to organizations interested in adopting cloud computing.					
5	MOB5	They provide technical and knowledge support to cloud computing adopters.					

PART THREE: INSTITUTIONAL FORCES

3.1 To what extent do you agree with the following statements regarding cloud computing adoption by your organization’s competitors?

Use the scale where 1=strongly disagree, 2=disagree, 3=undecided, 4=agree, 5=strongly agree. Tick appropriately.

	Factor	Factor Statement	Extent				
			1	2	3	4	5
1	MP1	Our main competitors who have adopted cloud computing have greatly benefited.					
2	MP2	Our main competitors who have adopted cloud computing are favourably perceived by others in the same industry.					
3	MP3	Our main competitors who have adopted cloud computing are favourably perceived by their customers.					
4	MP4	Our main competitors who have adopted cloud					

		computing are favourably perceived by their suppliers.					
5	CP1	The government requires our organization to use cloud computing.					
6	CP2	The industry association requires our organization to use cloud computing.					
7	CP3	The competitive conditions require our organization to use cloud computing.					
8	CP4	The parent organization requires all branches to use cloud computing.					

3.2 Please indicate the level of Cloud computing adoption by the following entities. Use the scale: **1**=very low, **2**=low, **3**=undecided, **4**=high, **5**=very high. Tick appropriately.

	Factor	Factor Statement	Rating				
			1	2	3	4	5
1	NP1	The extent of cloud computing adoption by your firm's suppliers.					
2	NP2	The extent of cloud computing adoption by your firm's customers.					
3	NP3	The extent to which the government's promotion information and communication technology influences your firm to use cloud computing.					
4	NP4	The extent to which industry or trade bodies your firm belong to has influenced the adoption of cloud computing by your firm.					

PART FOUR: ORGANIZATIONAL MINDFULNESS

4.1 To what extent do you agree with the following statements regarding working environment in your organization?

Use the scale where **1**=strongly disagree, **2**=disagree, **3**=undecided, **4**=agree, **5**=strongly agree. Tick appropriately.

	Factor	Factor Statement	Extent				
			1	2	3	4	5
1	PF1	The firm focuses more on employees failures than successes					
2	PF2	The firm treats near misses and errors as information about the health of our system and try to learn from them.					
3	PF3	Employees are inclined to report mistakes that could have significant consequences even if nobody notices.					
4	PF4	Employees feel free to talk to superiors about problems.					
5	PF5	Employees are rewarded if they sport problems,					

		mistakes, errors or failures.						
6	RI1	Questioning is encouraged in the firm						
7	RI2	Employees are encouraged to express different views of the world.						
8	RI3	Employees listen carefully; it is rare that anyone's view is dismissed.						
9	RI4	The firm appreciates sceptics.						
10	SO1	Employees are encouraged to immediately share operational information with each other.						
11	SO2	Should problems occur within the firm, someone with the authority to act is always accessible and available.						
12	SO3	During an average day, employees come into enough contact with each other to build a clear picture of the current situation.						
13	SO4	Employees have access to (additional) resources if unexpected situations occur.						
14	SO5	Employees are encouraged to communicate operational anomalies as they occur.						
15	CR1	Employees are committed to solve any problem that arises.						
16	CR2	Employees are encouraged to limit any negative consequences so that the firm can continue operations in case of a mistake.						
17	CR3	Employees are known for their ability to use their knowledge in novel ways.						
18	CR4	Employees have a number of informal contacts that they sometimes use to solve problems.						
19	CR5	Employees are given tasks from which they can learn more about different aspects of the operational processes						
20	US1	If something out of the ordinary happens, employees know who has the expertise to respond.						
21	US2	Our employees are comfortable asking others with more expertise for help.						
22	US3	In this organization, the people most qualified to make decisions make them.						
23	US4	Employees in this organization value expertise over hierarchical rank.						
24	US5	Employees in this organization value experience over hierarchical rank.						

PART FIVE: CLOUD COMPUTING ADOPTION

5.1 To what extent has the following cloud computing services been adopted in your organization?

Use the scale where **1**= no extent, **2**= little extent, **3**= moderate extent, **4**= great extent, **5**= very great extent. Tick appropriately.

	Cloud Service	Explanation	Extent				
			1	2	3	4	5
1	Software As A Service (SaaS)	Using applications like Google Docs, Office 365 etc					
2	Platform As A Service (PaaS)	Using development platforms like Android, Windows .Net, Java that run on the cloud					
3	Infrastructure As A Service (IaaS)	Using cloud storage for the organization's data.					
4	Communication As A Service (CaaS)	This includes telephony, messaging, conferencing, presence and notification, based on assets owned, managed and co-located by third parties.					

5.2 To what extent has the following business functions been moved to the cloud by your organization?

Use the scale where **1**= no extent, **2**= little extent, **3**= moderate extent, **4**= great extent, **5**= very great extent. Tick appropriately.

	Business Function	Extent				
		1	2	3	4	5
1	The firm's Messaging and Collaboration					
2	The firm's Human Resources data					
3	The firm's Procurement Processes					
4	The firm's CRM/Sales Management					
5	The firm's Accounting and Finance					
6	The firm's Project Management					
7	The firm's Application Development					
8	The firm's Payroll system					
9	The firm's Data Storage					
10	Other(Place identify and rate accordingly)					

PART SIX: FIRM PERFORMANCE

6.1 To what extent do you agree with the following statements with regards to your organizations performance since adopting cloud computing?

Use the scale where **1**=strongly disagree, **2**=disagree, **3**=undecided, **4**=agree, **5**=strongly agree. Tick appropriately.

	Factor	Factor Statement	Rating				
			1	2	3	4	5
1	Revenue Growth	Has the turnover of your company increased since adopting cloud computing?					
2	Productivity	Has the productivity of your company					

	Enhancement	increased since adopting cloud computing?					
3	Market Share	Has the share of your organization in its most significant market increased since adopting cloud computing?					
4	Productivity	Has your company been profitable since it adopted cloud computing					

APPENDIX B: SEM Data Analysis Diagram

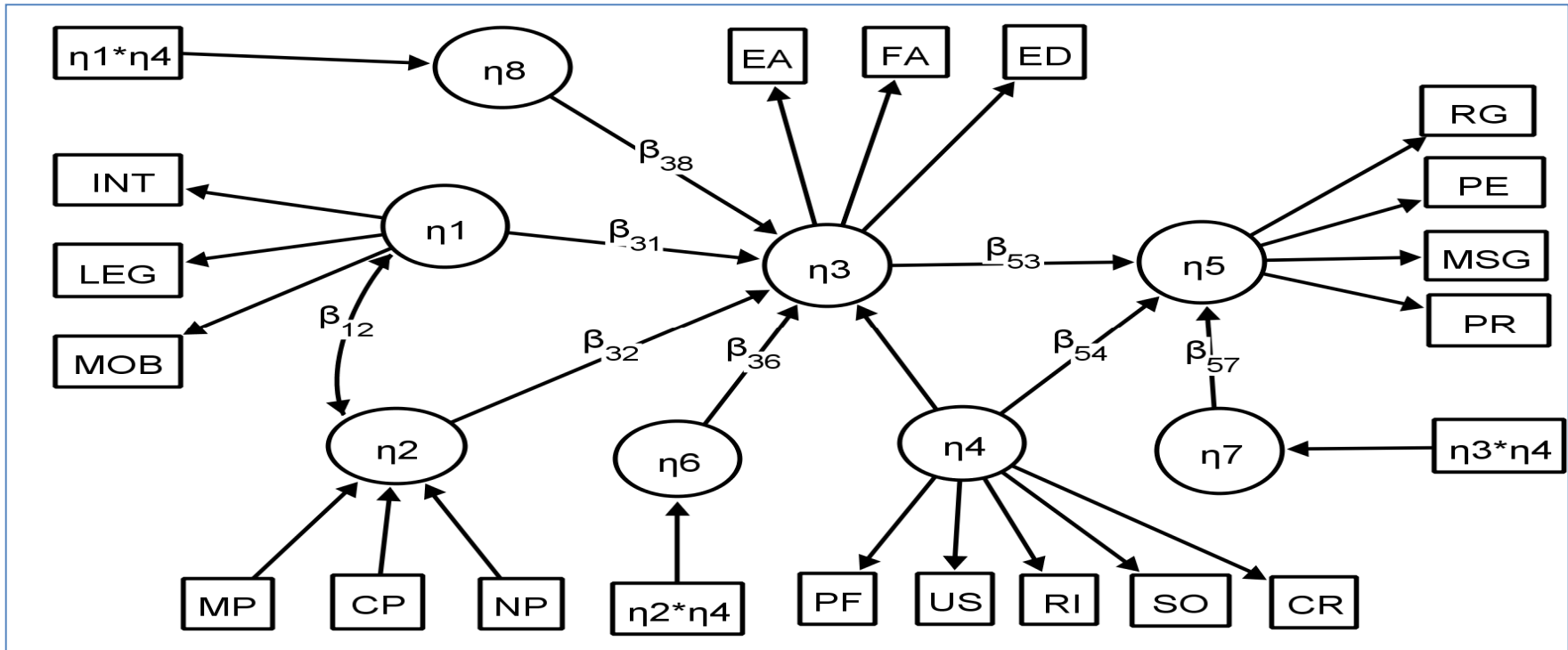


Figure B.1: SEM Data Analysis Diagram

INT=Interpretation, LEG=Legitimation, MOB=Mobilization, MP=Mimetic Pressure, CP=Coercive pressure, NP=Normative pressure, PF=Preoccupation with failure, US= Underspecification of structures, RI= Reluctance to simplify, SO=Sensitivity to operations, CR=Commitment to resilience, EA=Earliness of Adoption, FA=Frequency of adoption, ED=Extent of adoption, RG=Revenue growth, PE=Productivity enhancement, MSG=Market share growth , PR= Profitability, η_1 =Cloud computing vision, η_2 =Institutional forces, η_3 =Cloud computing adoption, η_4 =Organizational mindfulness, η_5 =Firm performance, β_i = Path coefficients.

**APPENDIX C: Web Based Questionnaire, Introduction Letter, Cover
Letter and Differentiated Reminders.**

i) Web Based Questionnaire

PART ONE: GENERAL INFORMATION

1. What is your job title? Check the one that applies.

Chief Information Technology Officer

ICT Manager

Information Systems Manager

Chief Information Officer

Information Security Manager

Other (please specify)

2. How long have you worked as a manager with ICT related responsibilities?(Indicate in years)

3. How long have you worked in this organization? (Indicate in years)

4. Classify your organization according to industry. Tick the one that applies.

ICT

Money, Banking and Finance

Manufacturing

Other

5. How long has this organization been operational in Kenya? (Indicate in years)

6. Specify the size of your organization in terms of the number of employees.

CLOUD COMPUTING VISION

7. The following are sources of information on cloud computing. Rank them according to the order of usefulness as a source of cloud computing information for your organization. Rank from 1 (most useful) to 8 (list useful)

<input type="checkbox"/>	Professional Associations' publications and conferences
<input type="checkbox"/>	Industry Associations' publications and conferences
<input type="checkbox"/>	Cloud Computing Vendors
<input type="checkbox"/>	Cloud Computing white papers
<input type="checkbox"/>	Business Consulting firms
<input type="checkbox"/>	Academic journals and conferences
<input type="checkbox"/>	Government agencies
<input type="checkbox"/>	Government policy papers

8. To what extent do you agree with the following statements regarding how intelligible and informative public discourse in cloud computing is? Use the scale where 1=strongly disagree, 2=disagree, 3=undecided, 4=agree, 5=strongly agree. Choose appropriately.

	1	2	3	4	5
We as an industry have a common understanding of cloud computing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Good information on cloud computing is easily available.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Key players in the industry continuously discuss cloud computing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The importance of cloud computing is currently clear to our organization.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
So far, we have heard enough of discussions on disadvantages of cloud computing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The sources of information available provide different perspectives regarding cloud computing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. To what extent do you agree with the following statements regarding how cloud computing vendors and cloud computing entrepreneurs have been explaining the role of cloud computing in a business environment?

Use the scale where 1=strongly disagree, 2=disagree, 3=undecided, 4=agree, 5=strongly agree. Tick appropriately.

	1	2	3	4	5
They define key features and usage of cloud computing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They describe characteristics of cloud computing that are in alignment with business best practices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	1	2	3	4	5
They describe cloud computing implementation success factors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The vendors discuss challenges associated with cloud computing adoption.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They explain how cloud computing adoption improves the quality IT operations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They explain how cloud computing improves the financial performance when adopted by an organization.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They explain how cloud computing improves the business performance when adopted by an organization.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They advertise their long term collaboration with organizations that have adopted cloud computing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They advertise their affiliation with influential industry level actors.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They emphasize their strong reputation in the cloud computing domain.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They explain the legal and regulatory issues in cloud computing adoption.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. To what extent do you agree with the following statements regarding how cloud computing vendors and cloud computing entrepreneurs have been promoting cloud computing adoption?

Use the scale where 1=strongly disagree, 2=disagree, 3=undecided, 4=agree, 5=strongly agree.

	1	2	3	4	5
They provide hardware and software resources to facilitate cloud computing adoption	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They provide relevant training regarding cloud computing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They provide cloud computing expositions through exhibitions during industry conferences.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They provide consulting services to organizations interested in adopting cloud computing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They provide technical and knowledge support to cloud computing adopters.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

PART THREE: INSTITUTIONAL FORCES

11. To what extent do you agree with the following statements regarding cloud computing adoption by your organization's competitors?

Use the scale where 1=strongly disagree, 2=disagree, 3=undecided, 4=agree, 5=strongly agree. Tick appropriately.

	1	2	3	4	5
Our main competitors who have adopted cloud computing have greatly benefited.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Our main competitors who have adopted cloud computing are favourably perceived by others in the our industry.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Our main competitors who have adopted cloud computing are favourably perceived by their customers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Our main competitors who have adopted cloud computing are favourably perceived by their suppliers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

12. To what extent do you agree with the following statements regarding factors that may have influenced your organization to adopt cloud computing ?

Use the scale where 1=strongly disagree, 2=disagree, 3=undecided, 4=agree, 5=strongly agree. Tick appropriately.

	1	2	3	4	5
The government requires organizations to use cloud computing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The industry association requires member organizations to use cloud computing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The competitive conditions require our organization to use cloud computing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Our parent organization requires all branches/subsidiaries to use cloud computing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. indicate the level of Cloud computing adoption by the following entities.

Use the scale: 1=very low, 2=low, 3=undecided, 4=high, 5=very high. Tick appropriately.

	1	2	3	4	5
The extent of cloud computing adoption by your firm's suppliers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The extent of cloud computing adoption by your firm's customers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The extent to which the government's promotion of ICT has influenced your firm to adopt cloud computing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The extent to which industry or trade bodies your firm belong to has influenced the adoption of cloud computing by your firm.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

ORGANIZATIONAL MINDFULNESS

14. To what extent do you agree with the following statements regarding the working environment in your organization?

Use the scale where 1=strongly disagree, 2=disagree, 3=undecided, 4=agree, 5=strongly agree. Tick appropriately.

	1	2	3	4	5
The organization focuses more on employees' failures than successes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The organization treats near failures and errors as indicators of the health of our systems and try to learn from them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Employees report mistakes that could have significant consequences on our operations even if nobody notices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Employees feel free to talk to superiors about problems within their areas of operations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Employees are rewarded if they report problems, mistakes, errors or failures within the organization.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Questioning of issues is encouraged in our organization.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Employees are encouraged to express their views regarding various issues in the organization.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Employees views are usually taken into account when making decisions on issues that affect them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	1	2	3	4	5
The organization appreciates employees who express their doubts decisions they think are not well informed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Employees are encouraged to immediately share operational information with each other.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Should problems occur within the organization, someone with the authority to act is always accessible and available.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
During an average day, employees come into enough contact with each other to share various issues regarding business operations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Employees have access to (additional) resources if unexpected situations occur.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Employees are encouraged to communicate operational anomalies as they occur.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Employees are committed to solve any problem that arises.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Employees are encouraged to limit any negative consequences so that the organization can continue operations in case of anomalies.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Employees are known for their ability to use their knowledge in novel ways.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	1	2	3	4	5
Employees have a number of informal contacts that they sometimes use to solve problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Employees are given tasks from which they can learn more about different aspects of the operational processes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If something out of the ordinary happens, employees know who has the expertise to respond to it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Our employees are comfortable asking others with more expertise for help.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In this organization, the people most qualified to make decisions make them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Employees in this organization value expertise over hierarchical rank.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Employees in this organization value experience over hierarchical rank.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

CLOUD COMPUTING ADOPTION

15. To what extent has the following cloud computing services been adopted in your organization?

Use the scale where 1= no extent, 2= little extent, 3= moderate extent, 4= great extent, 5= very great extent. Tick appropriately.

	1	2	3	4	5
Software As A Service (SaaS) e.g. Using applications like Google Docs, Office 365 etc	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Platform As A Service (PaaS) e.g. Using development platforms like Android, Windows .Net, Java that run on private or public cloud.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Infrastructure As A Service (IaaS) e.g. Using cloud storage services like Google Drive, Dropbox, OneDrive for storing organization's data.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Communication As A Service (CaaS) e.g. Google Gmail, VoIP, messaging, video conferencing, instant messaging (IM) based on assets owned, managed and co-located by third parties.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A data centre owned by the organization	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Virtualized resources	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16. To what extent do the following business operations use cloud computing in your organization?

Use the scale where 1= no extent, 2= little extent, 3= moderate extent, 4= great extent, 5= very great extent. Tick appropriately.

	1	2	3	4	5
Messaging and Collaboration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
E-mailing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Human Resources data	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Procurement Processes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CRM/Sales Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Accounting and Finance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Project Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Application Development	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Payroll system	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Data Storage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

FIRM PERFORMANCE

17. To what extent do you agree with the following statements with regards to your organization's performance since adopting cloud computing?

Use the scale where 1=strongly disagree, 2=disagree, 3=undecided, 4=agree, 5=strongly agree. Tick appropriately.

	1	2	3	4	5
Has the turnover of your company increased since adopting cloud computing?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Has the productivity of your company increased since adopting cloud computing?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Has the share of your organization in its most significant market increased since adopting cloud computing?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Has your company been profitable since it adopted cloud computing?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

ii) Introduction Letter



UNIVERSITY OF NAIROBI
COLLEGE OF HUMANITIES AND SOCIAL SCIENCES
SCHOOL OF BUSINESS
DOCTORAL STUDIES PROGRAMME

Telephone: 0701748135
Email: dsp@uonbi.ac.ke

P.O. Box 30197
Nairobi, Kenya

2nd July, 2015

TO WHOM IT MAY CONCERN

RE: OREDO JOHN OTIENO – D80/60320/2010

This is to certify that Oredo John Otiemo is a PhD candidate in the School of Business, University of Nairobi. The title of his study is **“Cloud Computing Vision, Institutional Forces, Organizational Mindfulness, Cloud Computing Adoption and Performance of Financial, ICT and Manufacturing Firms in Kenya”**.

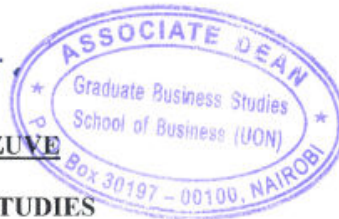
The purpose of this letter, therefore, is to kindly request you to assist and facilitate in carrying out the research/study in your organization. A questionnaire is herewith attached for your kind consideration and necessary action.

Data and information obtained through this exercise will be used for academic purposes only. Hence, the respondents are requested not to indicate their names anywhere on the questionnaire.

We look forward to your cooperation.

A handwritten signature in blue ink, appearing to read 'Stephen Nzube'.

PROF. STEPHEN N.M. NZUBE
ASSOCIATE DEAN,
GRADUATE BUSINESS STUDIES
SCHOOL OF BUSINESS



SNMN/mwk

iii) Questionnaire Cover Letter

Subject: Request to Fill a Questionnaire

I am John Otieno Oredo, a PhD candidate in Strategic Information Systems at the University of Nairobi. I am currently collecting data on cloud computing adoption by organizations within the Financial, ICT and Manufacturing sectors as a requirement to complete my thesis. This study has been approved by the University of Nairobi as per the letter on this link <https://www.dropbox.com/s/iwngw2q7v7otbyg/Authorization%20Letter.pdf?dl=0>

Kindly spare 10 minutes to fill the questionnaire with regard to cloud computing adoption in your organization. Should you be interested in the findings of this study, Let us know through john.oredo@gmail.com so that I plan to send you the report once the study is complete.

Thank you for accepting to fill the questionnaire.

I am looking forward to your quick response.

Regards,

John Otieno Oredo

First Reminder

Reminder: Request to Fill a Questionnaire

Thanks for accepting to fill my research questionnaire. However I noticed that you have not completed the process. I will be grateful if you could spare some time to complete the questionnaire to enable us analyze the data. I have therefore sent you a reminder on your mail. Kindly bear with me for any inconvenience caused.

Thanks for your co-operation.

Regards,

John Otieno Oredo,

PhD Candidate (Strategic Information Systems),

School of Business,

University of Nairobi.

Second Reminder

Reminder: Request to Fill a Questionnaire

About a few days ago, a questionnaire was sent to you that asked about the usage of cloud computing in your organization. We have not yet received your completed questionnaire.

We are writing to you again because of the importance your completed questionnaire has to us in getting accurate results in our study. It is only by hearing from nearly everyone included in our random sample that we can be sure the results of our study are representative.

Again, this study is very important for Information Systems researchers, practitioners and organizations as the results from this study will lead to a better understanding of the factors that determine cloud computing adoption by organizations. With this email is another link to the survey. We sincerely hope you will take 10 minutes to share your experiences with us by filling out our questionnaire.

Thank you again for your time and participation in the study.

Regards,

John Otieno Oredo

PhD Candidate (Strategic Information Systems)

School of Business,

University of Nairobi.

Third Reminder

Reminder: Request to Fill a Questionnaire

Recently, a survey seeking your opinion on cloud computing adoption in your organization was sent to you through either the company's email address or your personal email address.

We want to thank you and your organization for providing us with the contacts to send the survey. But we notice that you have not yet had time to complete our questionnaire, please do so today. We know that you are busy but your response will determine the success of our study. We assure you that your response will be treated

with utmost confidentiality, your details and those of your organization will not appear anywhere on the questionnaire or the thesis report.

If by any chance you did not receive the questionnaire or you are not able to trace it in your inbox, please find another copy with this email. In case of any enquiry, clarification, or if you would like to get a copy of the findings of this study, contact us through 0724702691 or john.oredo@gmail.com

Regards,

John Otieno Oredo,

PhD Candidate (Strategic Information Systems)
School of Business (SOB)
University of Nairobi.

Fourth Reminder

Reminder: Request to Fill a Questionnaire

During the last month, I have sent you a number of reminders asking you to complete a questionnaire for my on-going study on cloud computing adoption by organizations as part of my PhD studies. The purpose of the study is to investigate the role of institutional forces, organizational mindfulness and organizing vision in cloud computing adoption.

My data collection stage is ending on 4th, September, 2015. This is my last attempt to ask you to complete the questionnaire. I am sending you this last email with the questionnaire and hope you will fill it because your feedback is very important for the success of this study. Getting feedback from all the randomly sampled organizations will ensure accuracy of the research findings. I also want to assure you that your response to this study is voluntary. Further, your details and that of your organization remain anonymous and will not feature anywhere either in the questionnaire or the thesis report. If you already filled the questionnaire, then ignore this message and kindly accept my appreciation.

Again, I appreciate your time and willingness to consider my last request to fill the questionnaire. Thank You.

Regards,

John Otieno Oredo,
PhD Candidate (Strategic Information Systems),
School of Business (SOB),
University of Nairobi.

APPENDIX D: Cross Loadings and Data Analysis Results

Table D.1: Cross Loadings

Rotated Component Matrix ^a																
	Component															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
INT1	.189	.066	-.004	.215	.537	.074	.057	-.011	-.064	.117	.239	.319	.353	.022	-.005	.110
INT2	.106	.016	-.077	.085	.830	-.143	.147	.167	-.154	.182	-.074	-.018	-.072	.056	-.022	.067
INT3	.177	.246	.004	.122	.657	.272	-.008	-.027	.202	-.092	.006	-.011	.060	.018	.121	.010
INT4	.266	-.041	.254	.207	.328	.309	-.048	-.016	-.290	.056	-.172	.216	.043	.245	.029	.056
INT5	.191	-.088	.226	-.173	.057	-.050	.083	.191	-.044	-.154	.118	.198	-.035	.107	.041	.730
INT6	.096	.133	-.035	.096	.062	.052	.059	.108	-.080	-.002	-.093	.028	-.046	-.017	.905	.041
LEG1	.280	.502	.017	.213	.498	-.048	-.093	.197	-.052	-.031	.174	.161	.059	-.070	.205	-.112
LEG2	.329	.458	.192	.209	.486	.125	.100	.298	.097	-.088	-.069	.172	-.034	.084	-.067	-.165
LEG3	.393	.449	.160	.281	.319	-.075	.157	.223	-.127	-.021	.022	.212	-.199	.119	-.070	-.245
LEG4	.125	.196	.181	.208	.226	.063	.322	.008	.017	.039	.005	.664	-.047	-.065	-.043	.103
LEG5	.411	.372	-.062	.156	.337	.074	.109	.205	-.141	-.305	.106	.274	.043	.092	.051	-.184
LEG6	.349	.140	-.106	.335	.094	.040	.226	.352	-.054	-.330	.079	.291	-.245	.171	-.152	-.167
LEG7	.476	.184	.093	.304	.315	.052	.178	.344	-.222	-.284	.014	.168	-.041	.122	.046	-.229

LEG8	.123	.134	.173	.112	.166	.194	.142	.765	.020	.057	.078	.074	-.017	-.002	.053	.166
LEG9	.307	.228	.102	.204	.043	.051	.007	.744	-.028	.140	.064	-.022	.186	.101	.104	.059
LEG10	.294	.578	-.159	.141	.185	-.055	-.083	.393	-.091	.052	.066	.113	-.091	.196	.054	-.220
LEG11	.038	.176	.307	-.221	.140	-.244	.419	-.034	.210	.021	.141	.403	-.117	.263	.297	.025
MOB1	.160	.392	-.094	.237	-.038	-.095	-.094	.177	-.081	.029	-.140	.560	.086	.069	.132	.192
MOB2	.085	.754	.226	.135	.103	.255	.085	-.043	.119	.062	-.026	.082	.088	.085	.017	.010
MOB3	.037	.820	.076	-.006	.164	-.013	.297	-.009	-.105	-.032	.031	-.083	.123	-.042	.104	.069
MOB4	.368	.743	-.095	.088	.043	-.012	.049	.195	-.063	.006	-.091	.197	-.065	-.108	.044	.061
MOB5	.238	.766	-.027	.063	-.088	.073	.108	.076	.174	.070	-.034	.071	.163	.150	-.031	-.089
MP1	.189	.180	.154	.654	.334	.183	-.101	.070	-.068	-.060	.110	.293	.080	-.026	-.069	-.042
MP2	.034	.091	.142	.848	.165	.050	.107	.097	.026	.113	.026	.098	.128	.116	.022	-.064
MP3	-.005	.103	.162	.862	.101	.062	.211	.021	.086	-.012	-.016	.005	-.013	.087	-.019	-.025
MP4	.159	.083	.105	.819	-.039	.077	.114	.183	.230	.097	-.074	.024	-.013	-.019	.153	-.055
CP1	-.042	-.033	.193	.137	-.093	-.136	.135	.047	.823	.099	.019	-.175	-.031	.186	-.067	-.077
CP2	.053	.076	.025	.189	.004	.071	.139	-.041	.863	.002	.005	.100	-.095	.025	-.049	.057
CP3	.023	.347	.066	.252	.155	.216	.003	.073	.065	-.023	.129	-.026	.188	.658	.150	.083
CP4	.136	-.014	.134	.141	-.001	.078	.364	.150	.279	.136	.123	.032	.000	.640	-.244	.063
NP1	.201	.075	-.001	.440	.035	.105	.511	-.143	.164	.161	.321	-.051	-.132	.219	.033	.069
NP2	.190	.108	.177	.366	.111	.348	.327	.074	.067	-.044	.119	.031	-.326	.097	.053	.269
NP3	-.018	.191	.016	.178	.010	.071	.750	.032	.134	.197	.033	.046	.059	.020	.073	.007

NP4	.130	.131	.058	.144	.094	.239	.755	.148	.051	-.065	-.097	.114	-.065	.043	-.026	.011
PF1	-.260	-.225	.075	-.067	-.056	-.056	.063	-.084	.102	.061	.120	-.007	-.681	-.109	.074	.017
PF2	.232	.173	.122	.246	.034	.170	.062	.037	.033	.693	.015	-.041	-.168	.040	-.054	.009
PF3	.305	.010	.080	.003	.138	-.053	.190	.122	.032	.744	.164	.019	.115	-.009	.085	-.127
PF4	.659	.090	-.044	.158	.196	.102	-.074	.022	-.016	.292	.022	.136	-.297	-.138	-.146	.076
PF5	.138	-.355	.145	-.091	-.081	.210	.026	.061	.206	.551	-.179	.294	.072	.306	-.085	-.212
RI1	.621	-.081	-.025	-.005	.031	.253	-.035	-.128	-.069	.288	-.067	.158	-.131	.278	.109	.044
RI2	.812	.114	.072	.008	.086	.218	.043	.097	-.037	.006	-.127	.165	-.102	.023	-.201	.121
RI3	.777	.097	.117	.036	-.024	.086	.082	.012	-.004	.290	-.096	.039	.079	.181	-.017	.198
RI4	.725	.108	.080	.053	.170	.220	.011	.191	.214	.083	-.221	.075	-.053	.035	-.046	.105
SO1	.802	.088	.131	.187	-.068	-.057	.094	.103	.031	.138	.055	-.030	.154	.006	.170	-.019
SO2	.833	.154	.098	.091	-.014	-.013	.168	.086	-.050	.143	.076	-.058	.115	.062	.151	-.127
SO3	.612	.160	.157	.104	.064	-.066	.014	.061	-.127	.063	.112	-.079	.414	.045	.022	.028
SO4	.685	.132	.126	.031	.215	.271	.007	.164	-.017	.100	.045	.156	-.034	-.061	-.172	.075
SO5	.812	.184	.014	.083	.146	.075	-.069	.143	.003	-.098	.036	.083	-.102	-.184	-.027	.028
CR1	.709	-.010	.175	.022	.179	.262	.016	.288	-.014	-.125	.204	.103	-.112	-.002	.001	.019
CR2	.783	.207	.085	.125	-.051	-.090	.112	-.144	.028	.025	.132	-.144	.185	.025	.190	-.035
CR3	.720	.025	.250	.022	.034	.022	.175	.051	.208	.109	.173	.060	.270	-.016	.194	-.149
CR4	.321	-.144	.268	-.208	.120	.102	-.142	-.145	.452	.093	.281	.124	.128	-.114	.269	-.071
CR5	.647	.108	.148	-.027	.166	.131	.066	.237	.162	.083	.099	-.037	.314	-.038	.241	-.129

US1	.785	.277	.086	.001	.165	.071	.079	.179	-.046	-.091	-.018	.120	.014	.003	-.018	-.139
US2	.673	.171	-.002	.106	.039	.099	.017	-.079	.027	.020	.227	.253	.347	-.100	.016	-.071
US3	.671	.055	.100	.095	-.022	.204	-.034	-.233	-.114	.105	.258	.094	-.094	.263	-.042	.064
US4	.738	-.050	.325	-.082	.115	.027	-.052	-.002	.099	-.003	-.187	-.086	.064	.222	-.009	.169
US5	.625	-.063	.377	-.062	.125	.150	-.080	.164	.186	-.179	-.218	-.109	-.059	.060	.015	.197
CCA1	.222	-.019	.832	.154	.095	.137	.074	-.028	.108	.072	-.020	.012	.079	.073	-.050	.099
CCA2	.162	.010	.763	.118	.076	.018	.106	.152	.076	.196	.179	.087	.009	-.122	.135	-.106
CCA3	.161	.101	.855	.224	-.123	.063	.107	.028	-.036	-.019	.035	.067	-.126	.087	-.006	.037
CCA4	.253	.032	.778	.090	-.050	.289	-.126	.055	.113	.017	.001	-.041	.024	.068	-.114	.134
CCA5	.011	-.051	.050	.053	.039	.032	.047	.063	.025	.039	.879	-.038	-.015	.083	-.084	.038
CCA6	.184	.036	.521	-.114	-.065	.181	-.054	.180	.093	.015	.586	.032	-.085	.042	.021	.094
FP1	.395	.132	.310	.123	-.011	.607	.184	.129	-.003	.177	.062	-.009	-.059	.117	.126	-.030
FP2	.430	.195	.324	.130	.063	.652	.198	.035	-.063	.074	.202	.031	-.005	.124	-.007	-.065
FP3	.397	.052	.300	.223	.093	.611	.239	.231	.035	.049	.002	-.024	.117	.081	-.004	-.030
FP4	.438	.002	.371	.166	.025	.528	.312	.152	-.034	.085	.099	-.064	.175	.076	-.002	-.034

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 18 iterations.

**APPENDIX E: EXPLORATORY FACTOR ANALYSIS (EFA)
RESULTS**

E.1: EFA for the Indicators of the Latent Variable Cloud Computing Adoption

Table E.1: Descriptive Statistics for Interpretation (INT)

Descriptive Statistics			
	Mean	Std. Deviation	Analysis N
INT1	3.09092	1.162660	93
INT2	3.38968	1.033734	93
INT3	3.24680	1.044196	93
INT4	3.85522	.996777	93
INT5	3.18185	1.029217	93
INT6	3.61032	.934320	93

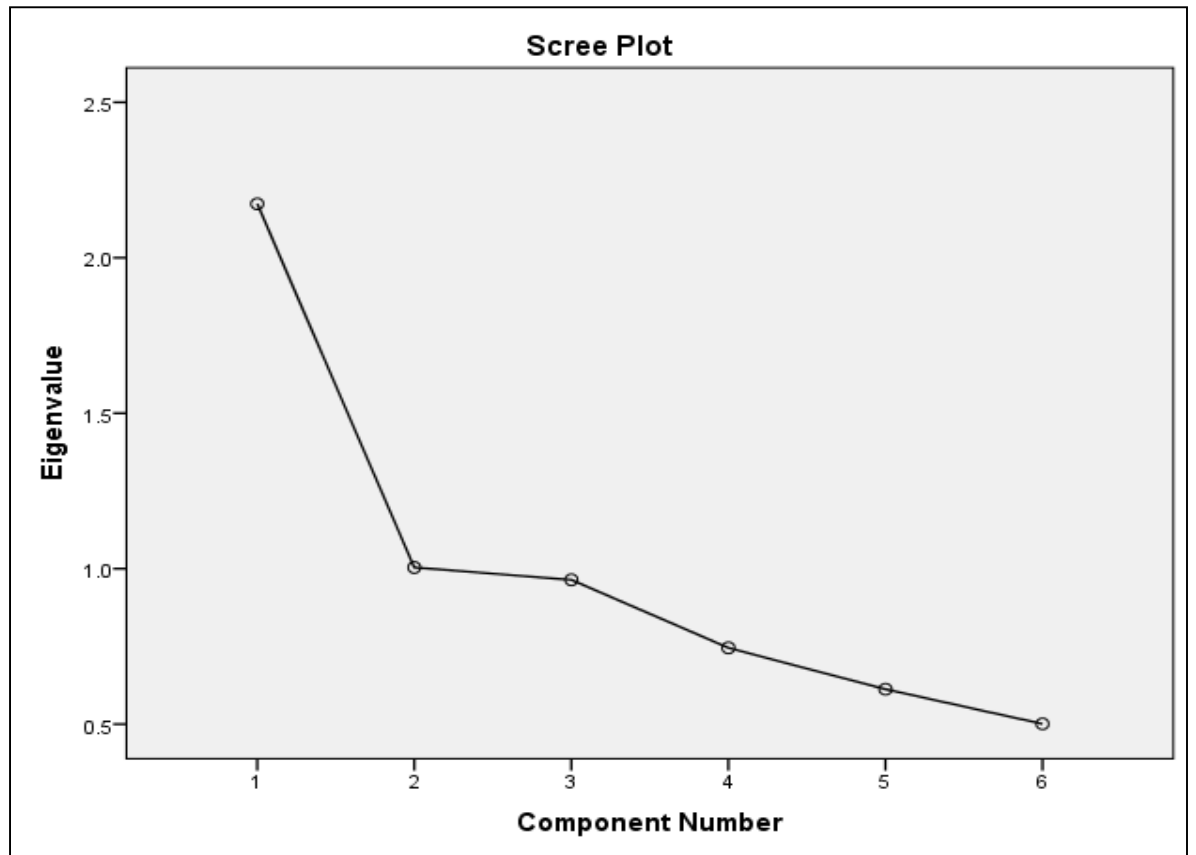


Figure E.1: Scree Plot for Interpretation

Table E.2: KMO and Bartlett's Test for Interpretation (INT)

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.721
Bartlett's Test of Sphericity	Approx. Chi-Square	65.285
	df	15
	Sig.	.000

Table E.3: Interpretation (INT) Total Variance Explained

Component	Total Variance Explained								
	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.173	36.224	36.224	2.173	36.224	36.224	2.036	33.935	33.935
2	1.004	16.731	52.956	1.004	16.731	52.956	1.141	19.020	52.956
3	.964	16.068	69.024						
4	.745	12.423	81.447						
5	.612	10.207	91.653						
6	.501	8.347	100.000						

Extraction Method: Principal Component Analysis.

Table E.4: Statistics for Legitimation (LEG)

Descriptive Statistics			
	Mean	Std. Deviation	Analysis N
LEG1	3.50000	1.047772	93
LEG2	3.52626	.960906	93
LEG3	3.57327	.934523	93
LEG4	2.77626	.995628	93
LEG5	3.85327	.952038	93
LEG6	3.61327	.987898	93
LEG7	3.80000	1.000000	93
LEG8	3.44596	.861519	93
LEG9	3.35613	.970991	93
LEG10	3.76313	.895258	93
LEG11	2.73687	.925114	93

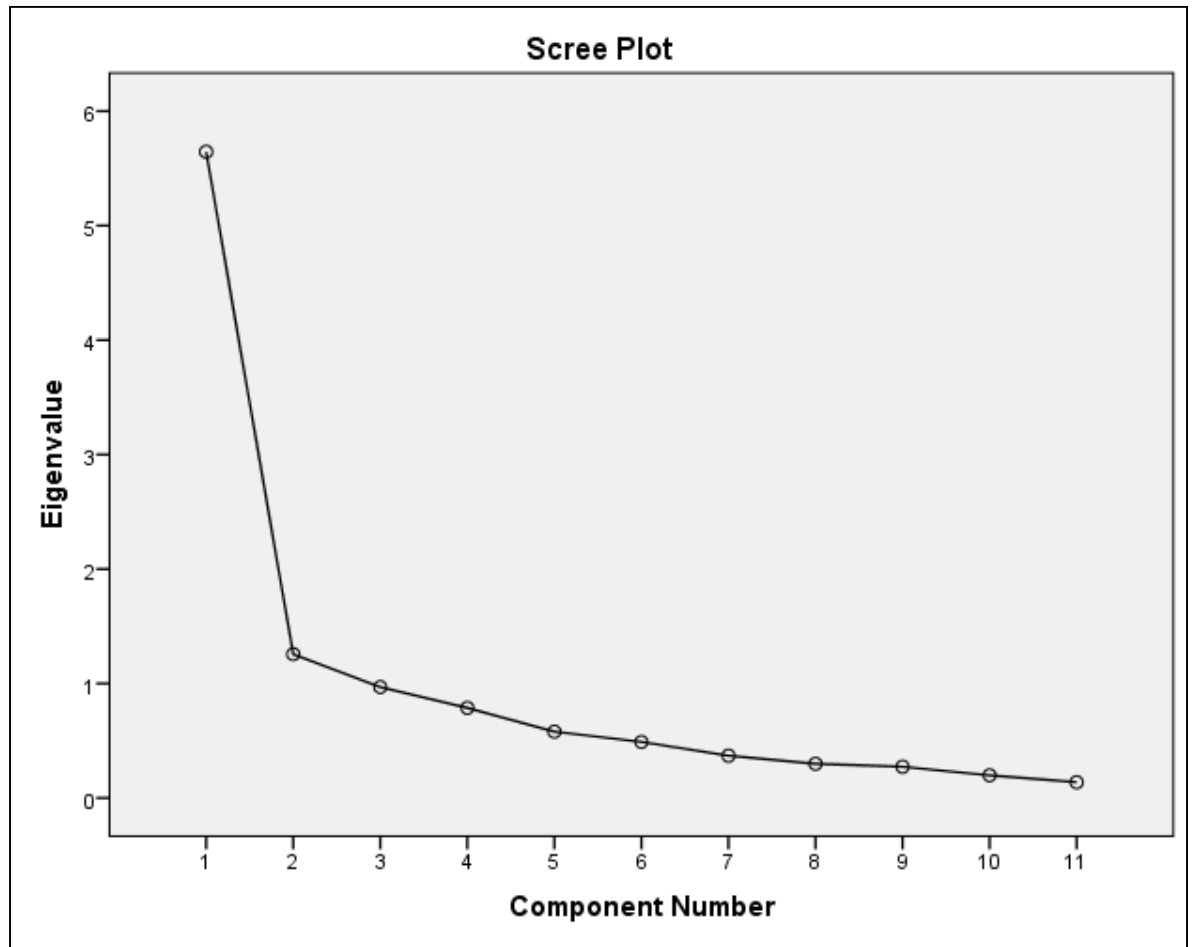


Figure E.2:Scree Plot for Legitimation

Table E.5:KMO and Bartlett's Test for Legitimation (LEG)

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.836
Bartlett's Test of Sphericity	Approx. Chi-Square	584.983
	df	55
	Sig.	.000

Table E.6: Legitimation (LEG) Total Variance Explained

Component	Total Variance Explained								
	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.645	51.314	51.314	5.645	51.314	51.314	4.995	45.406	45.406
2	1.256	11.418	62.732	1.256	11.418	62.732	1.906	17.326	62.732
3	.968	8.804	71.536						
4	.787	7.152	78.688						
5	.579	5.267	83.955						
6	.490	4.453	88.407						
7	.369	3.355	91.762						
8	.299	2.715	94.477						
9	.273	2.477	96.954						
10	.198	1.800	98.754						
11	.137	1.246	100.000						

Extraction Method: Principal Component Analysis.

Table E.7: Descriptive Statistics for Mobilization (MOB)

	Descriptive Statistics		
	Mean	Std. Deviation	Analysis N
MOB 1	3.26313	1.106978	93
MOB 2	3.42104	.969796	93
MOB 3	3.60522	.956431	93
MOB 4	3.53939	.993903	93
MOB 5	3.63166	.942270	93

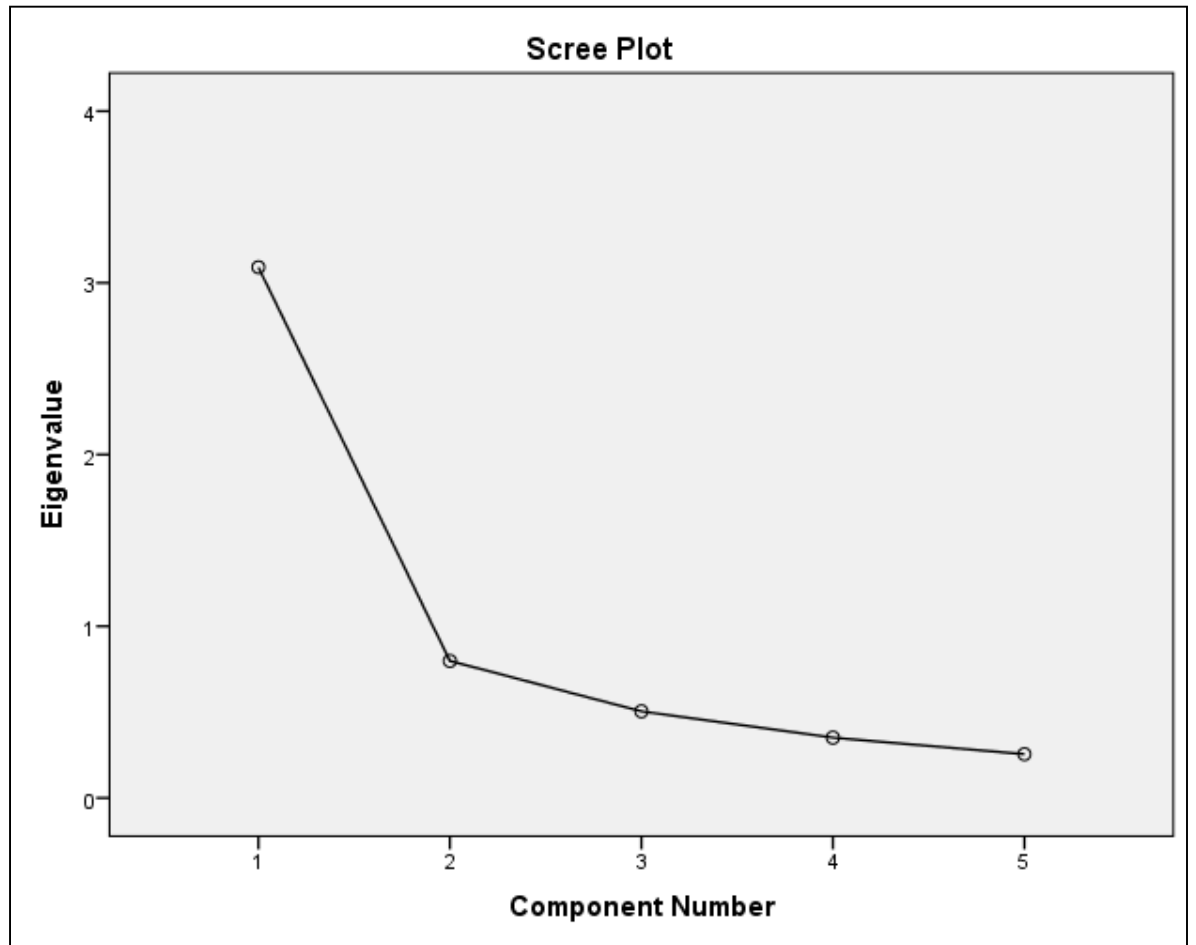


Figure E.3 Scree Plot for Mobilization (MOB)

Table E.8: KMO and Bartlett's Test for Mobilization (MOB)

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.788
Bartlett's Test of Sphericity	Approx. Chi-Square	196.237
	df	10
	Sig.	.000

Table E.9: Mobilization (MOB) Total Variance Explained

Component	Total Variance Explained								
	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.091	61.818	61.818	3.091	61.818	61.818			
2	.798	15.958	77.776						
3	.504	10.087	87.864						
4	.352	7.031	94.894						
5	.255	5.106	100.000						

Extraction Method: Principal Component Analysis.

E.2: EFA for the Indicators of the Latent Variable Institutional Forces (InstForces)

Table E.10: Descriptive Statistics for Mimetic Pressures (MP)

	Descriptive Statistics		
	Mean	Std. Deviation	Analysis N
MP1	3.30270	1.053150	93
MP2	3.15791	.944695	93
MP3	3.05327	.998840	93
MP4	3.06673	1.003617	93

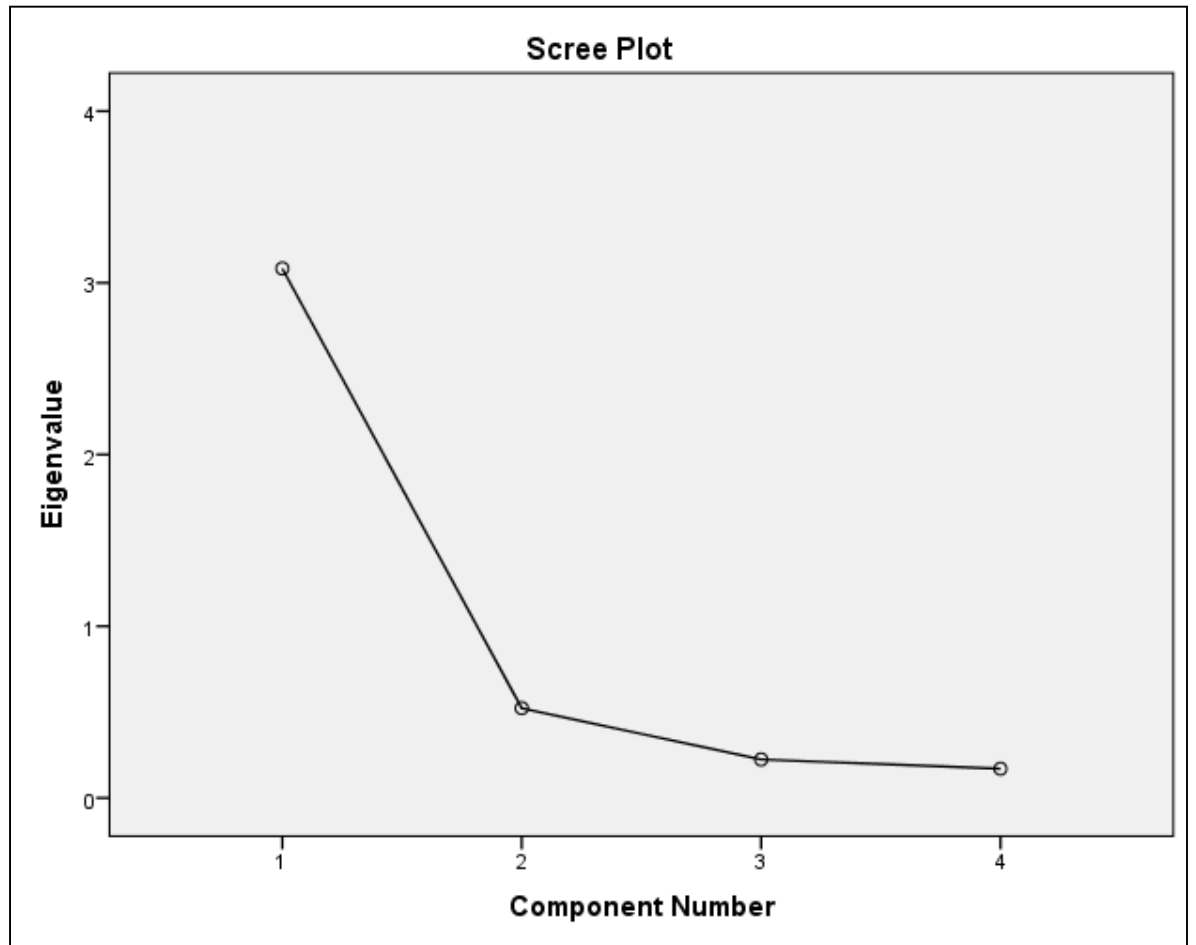


Figure E.4: Scree Plot for Mimetic Pressures (MP)

Table E.11: KMO and Bartlett's Test for Mimetic Pressures

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.820
Bartlett's Test of Sphericity	Approx. Chi-Square	250.592
	df	6
	Sig.	.000

Table E.12: Mimetic Pressures (MP) Total Variance Explained

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.083	77.079	77.079	3.083	77.079	77.079
2	.523	13.063	90.142			
3	.224	5.602	95.745			
4	.170	4.255	100.000			

Extraction Method: Principal Component Analysis.

Table E.13: Descriptive Statistics for Coercive Pressures (CP)

Descriptive Statistics			
	Mean	Std. Deviation	Analysis N
CP1	2.09327	.990974	93
CP2	2.18673	.952038	93
CP3	3.50000	1.065772	93
CP4	2.57327	1.190299	93

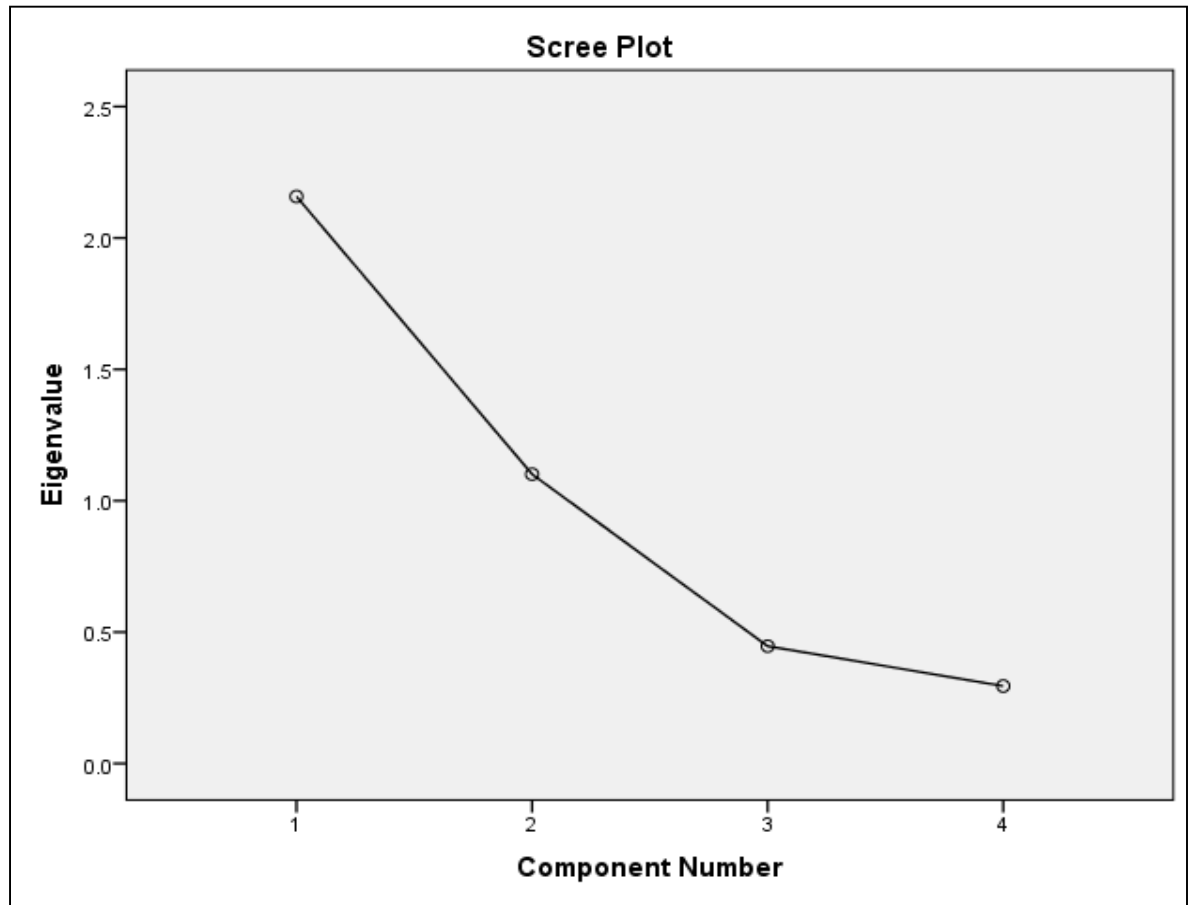


Figure E.5: Scree Plot for Coercive Pressures (CP)

Table E.14: KMO and Bartlett's Test for Coercive Pressures (CP)

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.599
Bartlett's Test of Sphericity	Approx. Chi-Square	104.424
	df	6
	Sig.	.000

Table E.15: Coercive Pressures (CP) Total Variance Explained

Total Variance Explained							
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings ^a
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	2.158	53.942	53.942	2.158	53.942	53.942	1.960
2	1.101	27.522	81.465	1.101	27.522	81.465	1.603
3	.447	11.167	92.631				
4	.295	7.369	100.000				

Extraction Method: Principal Component Analysis.

a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

Table E.16: Descriptive Statistics for Normative Pressures (NP)

Descriptive Statistics			
	Mean	Std. Deviation	Analysis N
NP1	2.64478	1.018353	93
NP2	2.67104	1.025630	93
NP3	2.37327	1.040206	93
NP4	2.63166	1.150067	93

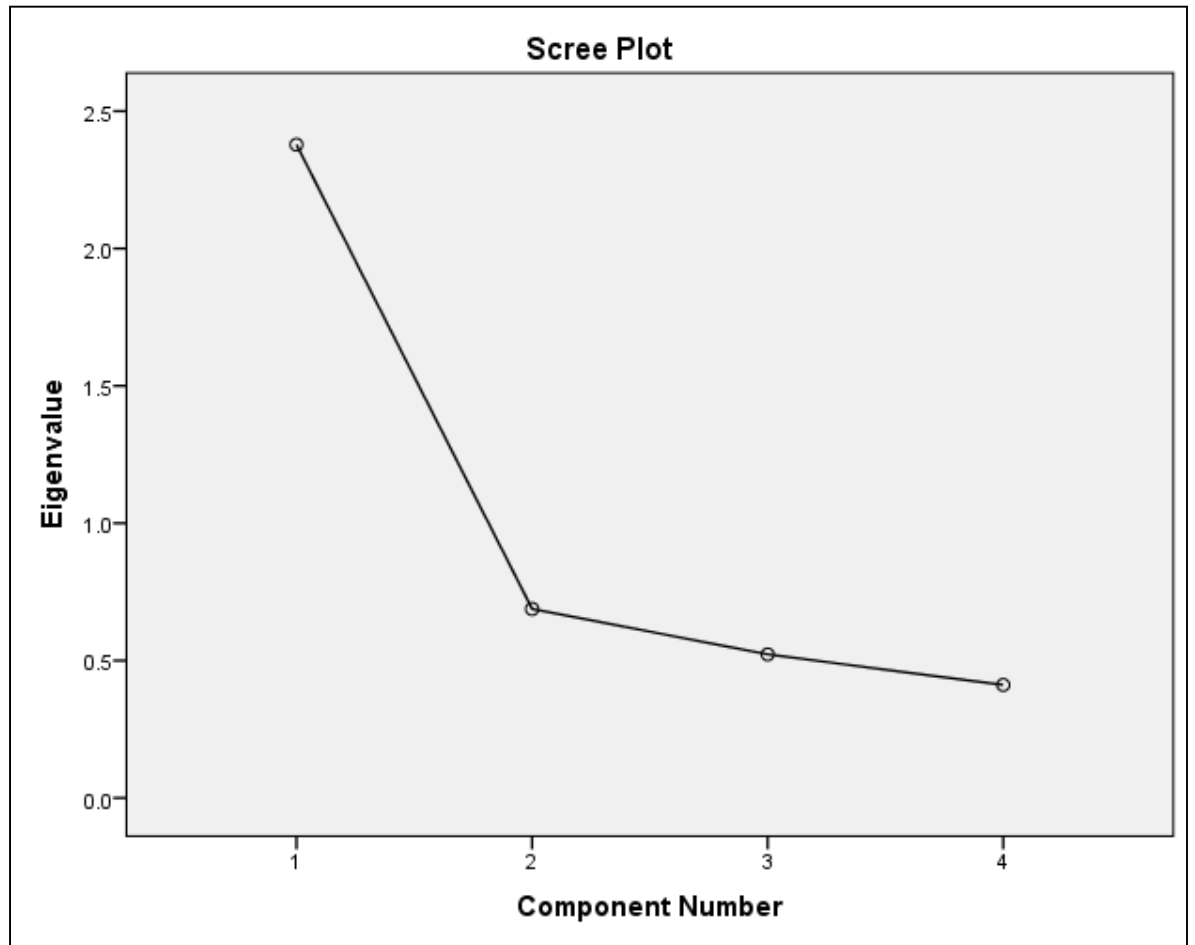


Figure E.6: Scree Plot for Normative Pressures (NP)

Table E.17: KMO and Bartlett's Test for Normative Pressures (NP)

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.742
Bartlett's Test of Sphericity	Approx. Chi-Square	93.840
	df	6
	Sig.	.000

Table E.18: Normative Pressures (NP)

Component	Total Variance Explained					
	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.378	59.446	59.446	2.378	59.446	59.446
2	.688	17.201	76.646			
3	.523	13.069	89.716			
4	.411	10.284	100.000			

Extraction Method: Principal Component Analysis.

E.3: EFA for the Indicators of the Latent Variable Organizational Mindfulness (OrgMindfulness)

Table E.19: Descriptive Statistics for Preoccupation with Failure (PF)

	Descriptive Statistics		
	Mean	Std. Deviation	Analysis N
PF1	2.21617	1.024380	93
PF2	3.68915	.833088	93
PF3	3.54063	.886973	93
PF4	3.66213	.947273	93
PF5	2.78086	1.013459	93

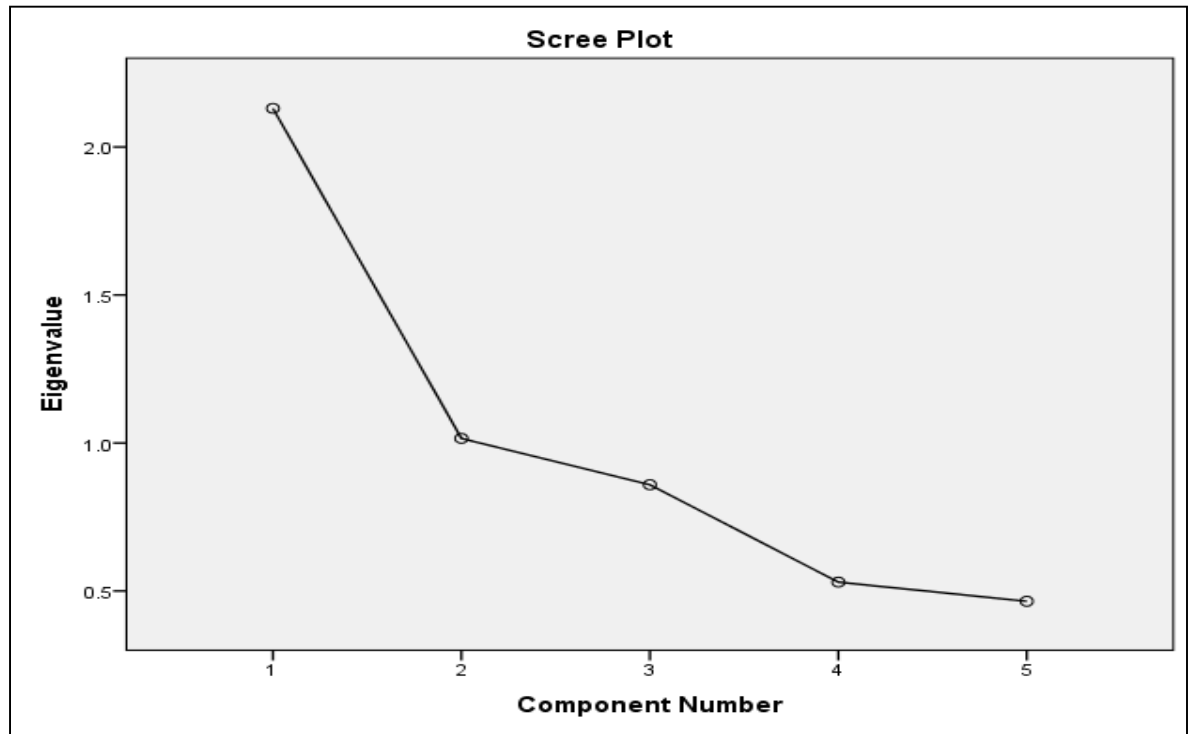


Figure E.7: Scree Plot for Preoccupation with Failure (PF)

Table E.20: KMO and Bartlett's Test for Preoccupation with Failure (PF)

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.692
Bartlett's Test of Sphericity	Approx. Chi-Square	69.850
	df	10
	Sig.	.000

Table E.21: Preoccupation with Failure (PF) Total Variance Explained

Total Variance Explained							
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings ^a
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	2.130	42.606	42.606	2.130	42.606	42.606	2.124
2	1.016	20.311	62.916	1.016	20.311	62.916	1.045
3	.859	17.179	80.095				
4	.530	10.600	90.694				
5	.465	9.306	100.000				

Extraction Method: Principal Component Analysis.

a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

Table E.22: Descriptive Statistics for Reluctance to Simplify Interpretations (RI)

Descriptive Statistics			
	Mean	Std. Deviation	Analysis N
RI1	3.52702	.991518	93
RI2	3.62170	1.039468	93
RI3	3.41097	1.030361	93
RI4	3.33787	.947273	93

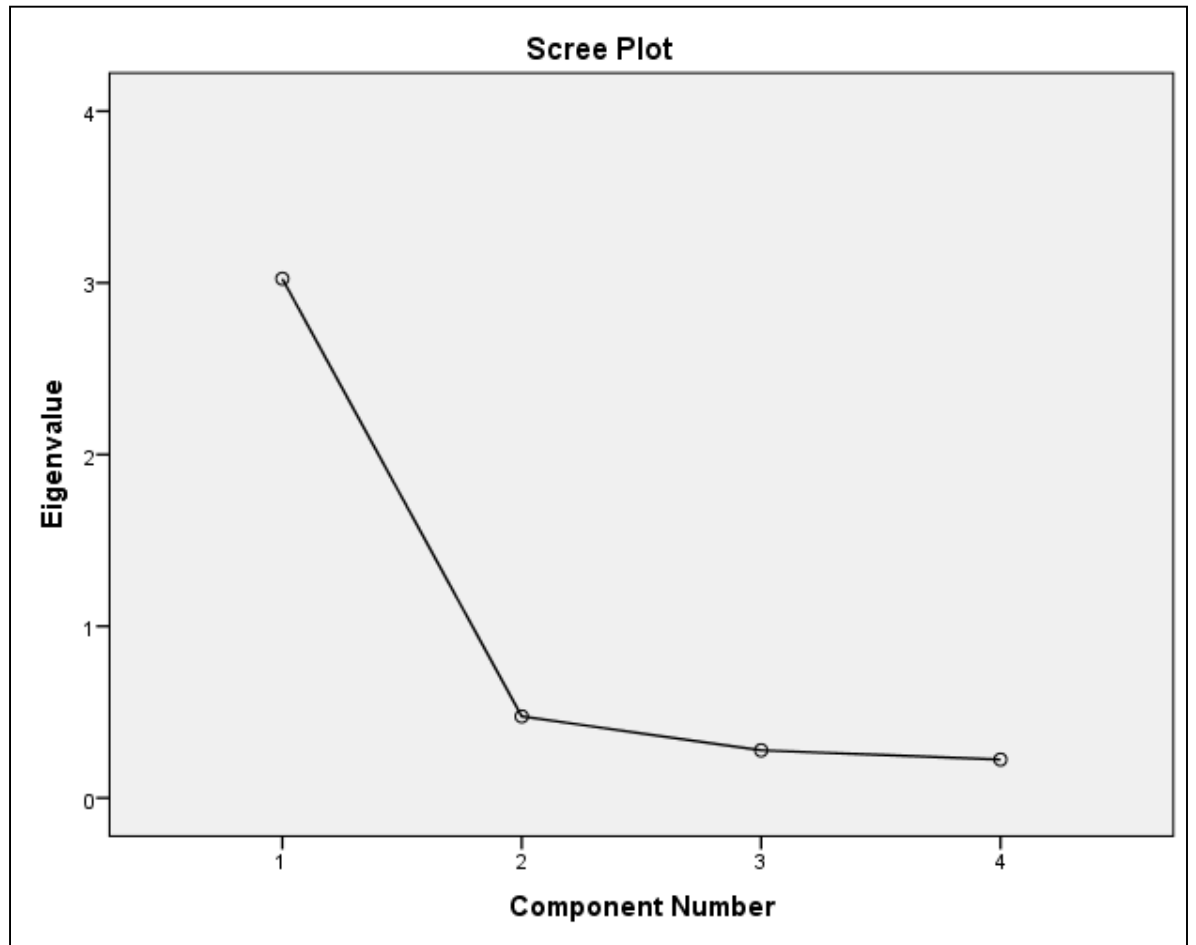


Figure E.8: Scree Plot for Reluctance to Simplify Interpretations (RI)

Table E.23: KMO and Bartlett's Test for Reluctance to Simplify Interpretations (RI)

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.823
Bartlett's Test of Sphericity	Approx. Chi-Square	217.169
	df	6
	Sig.	.000

Table E.24: Reluctance to Simplify Interpretations (RI) Total Variance Explained

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.024	75.598	75.598	3.024	75.598	75.598
2	.475	11.873	87.470			
3	.277	6.935	94.405			
4	.224	5.595	100.000			

Extraction Method: Principal Component Analysis.

Table E.25: Descriptive Statistics for Sensitivity to Operations (SO)

Descriptive Statistics			
	Mean	Std. Deviation	Analysis N
SO1	3.72978	.888297	93
SO2	3.75681	.941908	93
SO3	3.66213	.935728	93
SO4	3.31085	1.062459	93
SO5	3.68915	.966006	93

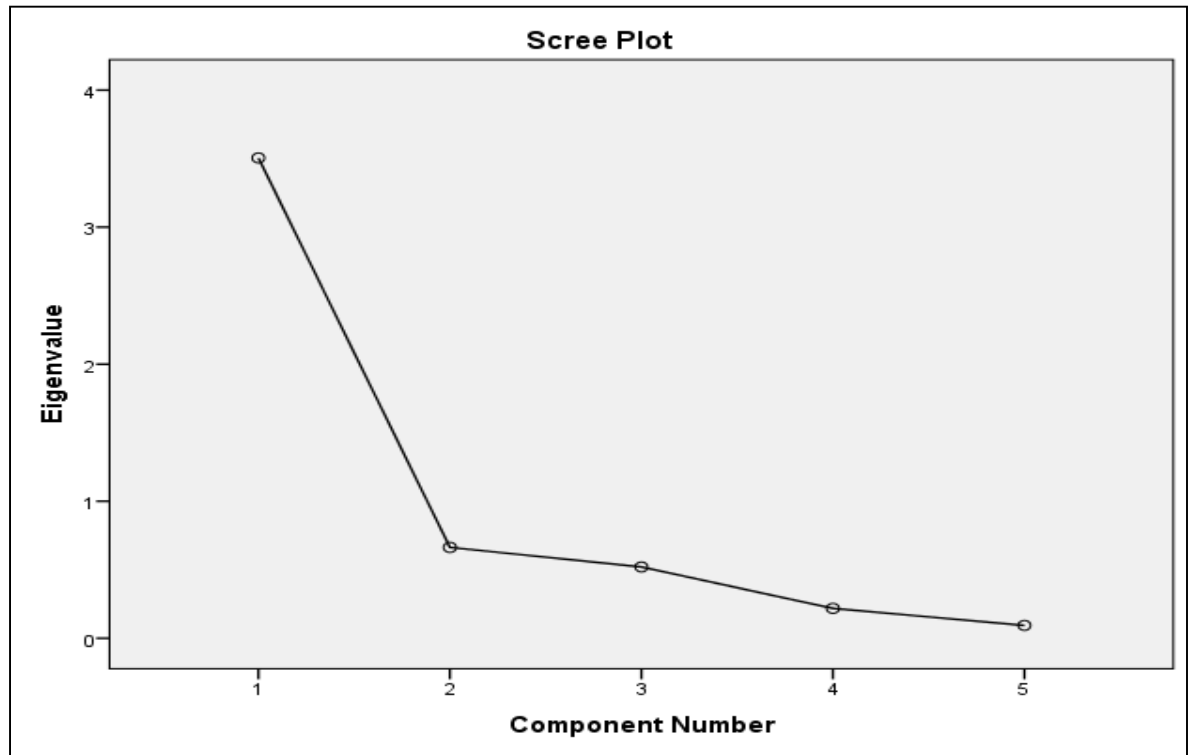


Figure E.9: Scree Plot for Sensitivity to Operations (SO)

Table E.26: KMO and Bartlett's Test for Sensitivity to Operations (SO)

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.768
Bartlett's Test of Sphericity	Approx. Chi-Square	331.274
	df	10
	Sig.	.000

Table E.27: Sensitivity to Operations (SO) Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.505	70.100	70.100	3.505	70.100	70.100
2	.663	13.262	83.361			
3	.520	10.406	93.767			
4	.218	4.359	98.126			
5	.094	1.874	100.000			

Extraction Method: Principal Component Analysis.

Table E.28: Descriptive Statistics for Commitment to Resilience (CR)

Descriptive Statistics			
	Mean	Std. Deviation	Analysis N
CR1	3.68915	.954687	93
CR2	3.71617	.903138	93
CR3	3.60809	.953456	93
CR4	3.32882	.897518	93
CR5	3.62170	.974710	93

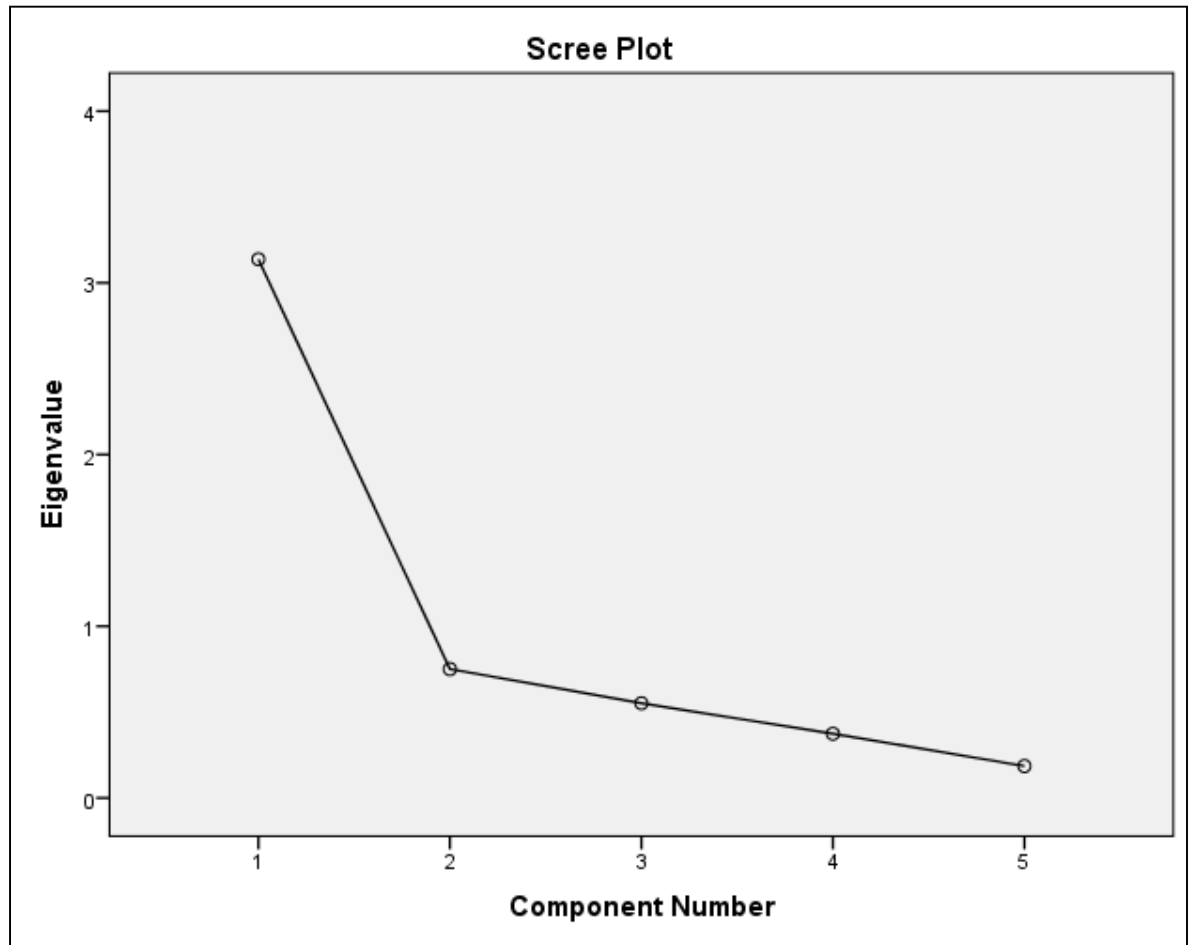


Figure E.10: Scree Plot for Commitment to Resilience (CR)

Table E.29: KMO and Bartlett's Test for Commitment to Resilience (CR)

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.812
Bartlett's Test of Sphericity	Approx. Chi-Square	215.068
	df	10
	Sig.	.000

Table E.30: Commitment to Resilience (CR) Total Variance Explained

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.137	62.746	62.746	3.137	62.746	62.746
2	.751	15.017	77.763			
3	.552	11.032	88.795			
4	.374	7.485	96.280			
5	.186	3.720	100.000			

Extraction Method: Principal Component Analysis.

Table E.31: Descriptive Statistics for Underspecification of Structures (US)

Descriptive Statistics			
	Mean	Std. Deviation	Analysis N
US1	3.72978	.970178	93
US2	3.94596	.870930	93
US3	3.52702	.980494	93
US4	3.42473	.988167	93
US5	3.41097	1.019757	93

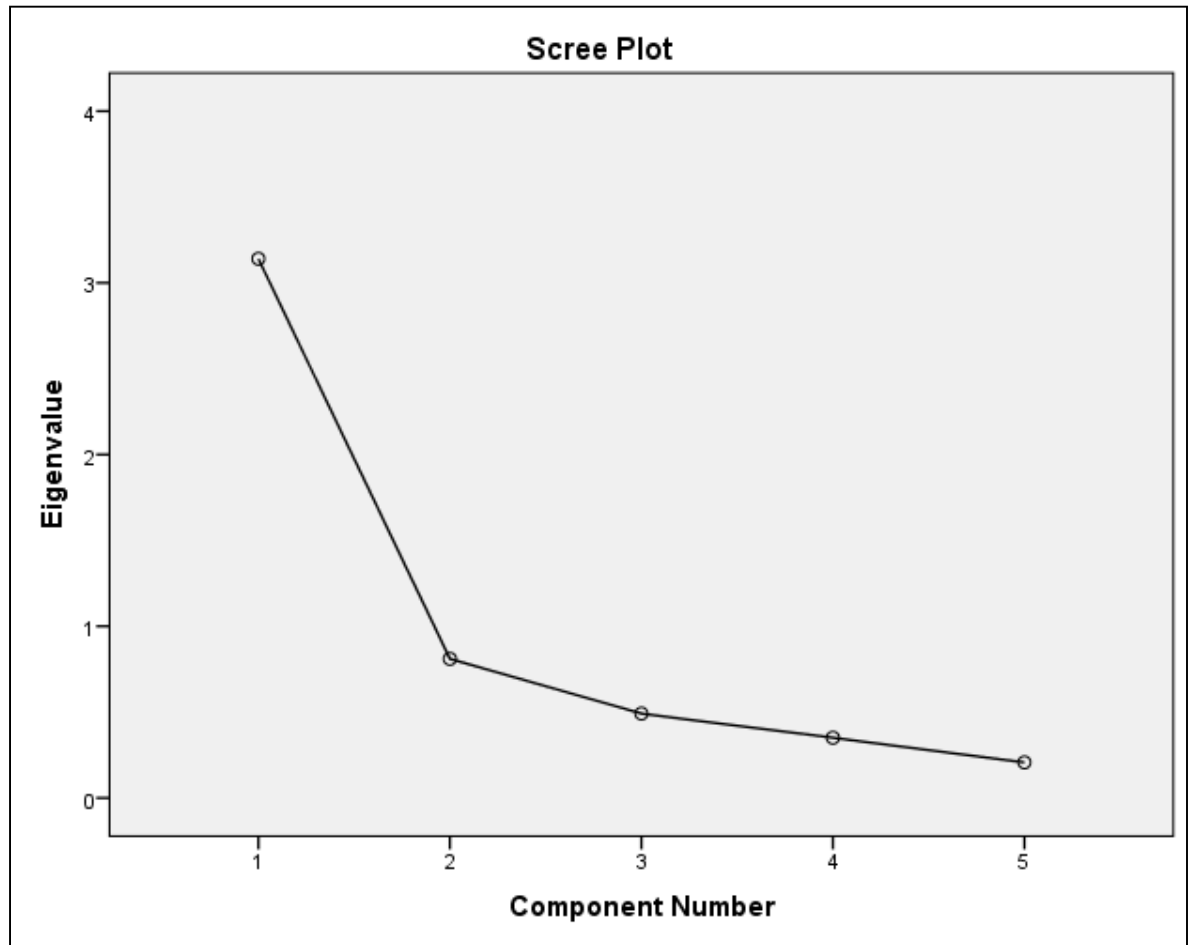


Figure E.11: Scree Plot for Underspecification of Structures (US)

Table E.32: KMO and Bartlett's Test for Underspecification of Structures (US)

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.778
Bartlett's Test of Sphericity	Approx. Chi-Square	214.556
	df	10
	Sig.	.000

Table E.33: Underspecification of Structures (US) Total Variance Explained

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.140	62.804	62.804	3.140	62.804	62.804
2	.810	16.203	79.007			
3	.491	9.829	88.835			
4	.351	7.017	95.852			
5	.207	4.148	100.000			

Extraction Method: Principal Component Analysis.

E.4: EFA for the Indicators of the Latent Variable Cloud Computing Adoption (CCA)

Table E.34: Descriptive Statistics for Cloud Computing Adoption (CCA)

Descriptive Statistics			
	Mean	Std. Deviation	Analysis N
CCA1	3.20276	1.302003	93
CCA2	3.02702	1.375033	93
CCA3	3.40532	1.259045	93
CCA4	3.52702	1.190752	93
CCA5	3.68495	1.267287	93
CCA6	3.91785	1.139731	93

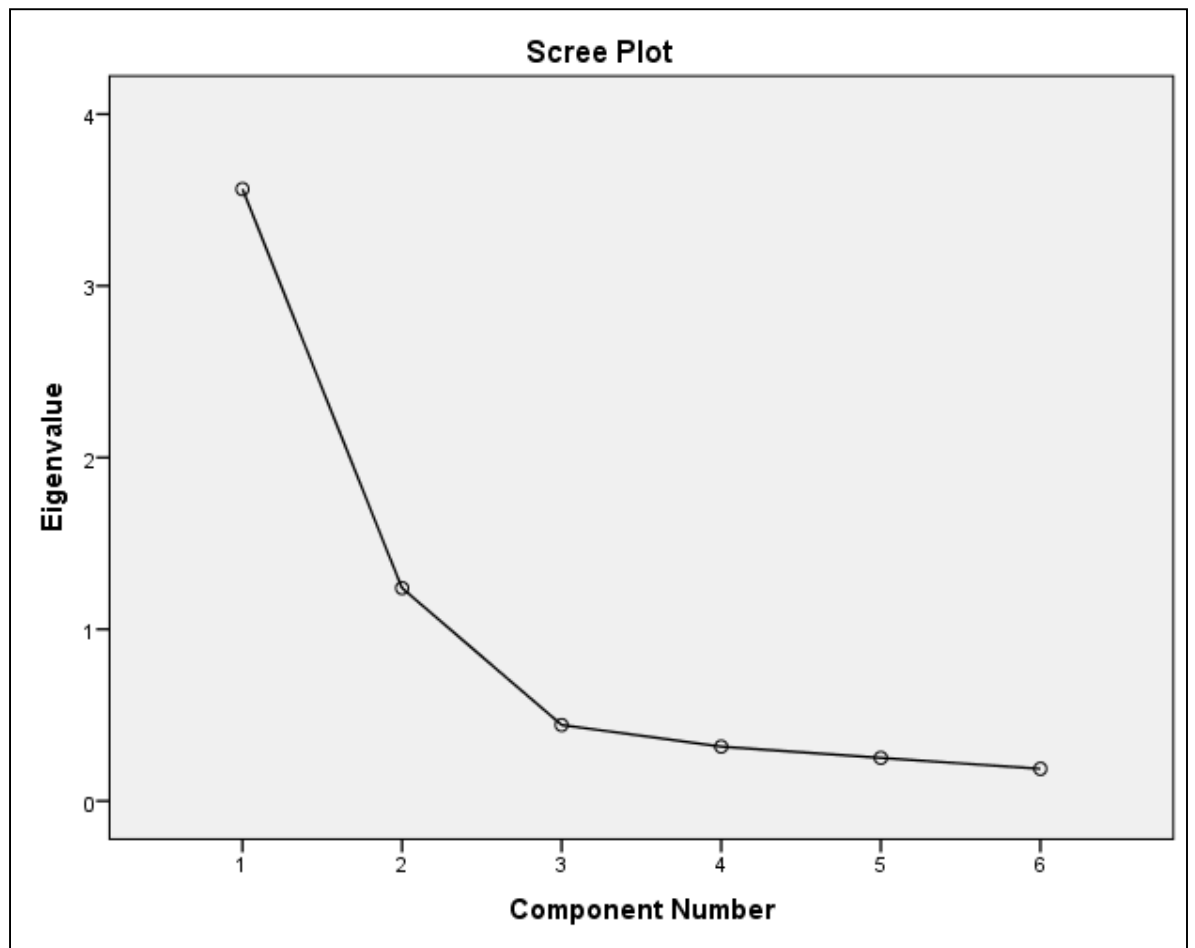


Figure E.12: Scree Plot for Cloud Computing Adoption (CCA)

Table E.35: KMO and Bartlett's Test for Cloud Computing Adoption (CCA)

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.806
Bartlett's Test of Sphericity	Approx. Chi-Square	315.576
	df	15
	Sig.	.000

Table E.36: Cloud Computing Adoption (CCA) Total Variance Explained

Total Variance Explained							
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings ^a
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	3.563	59.390	59.390	3.563	59.390	59.390	3.478
2	1.240	20.663	80.053	1.240	20.663	80.053	1.817
3	.443	7.375	87.428				
4	.316	5.272	92.700				
5	.251	4.177	96.877				
6	.187	3.123	100.000				

Extraction Method: Principal Component Analysis.

a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

E.5: EFA for the Indicators of the Latent Variable Firm Performance (FP)

Table E.37: Descriptive Statistics for Firm Performance (FP)

Descriptive Statistics			
	Mean	Std. Deviation	Analysis N
FP1	3.15075	1.070059	93
FP2	3.52702	1.125041	93
FP3	3.23290	1.016393	93
FP4	3.30129	1.059993	93

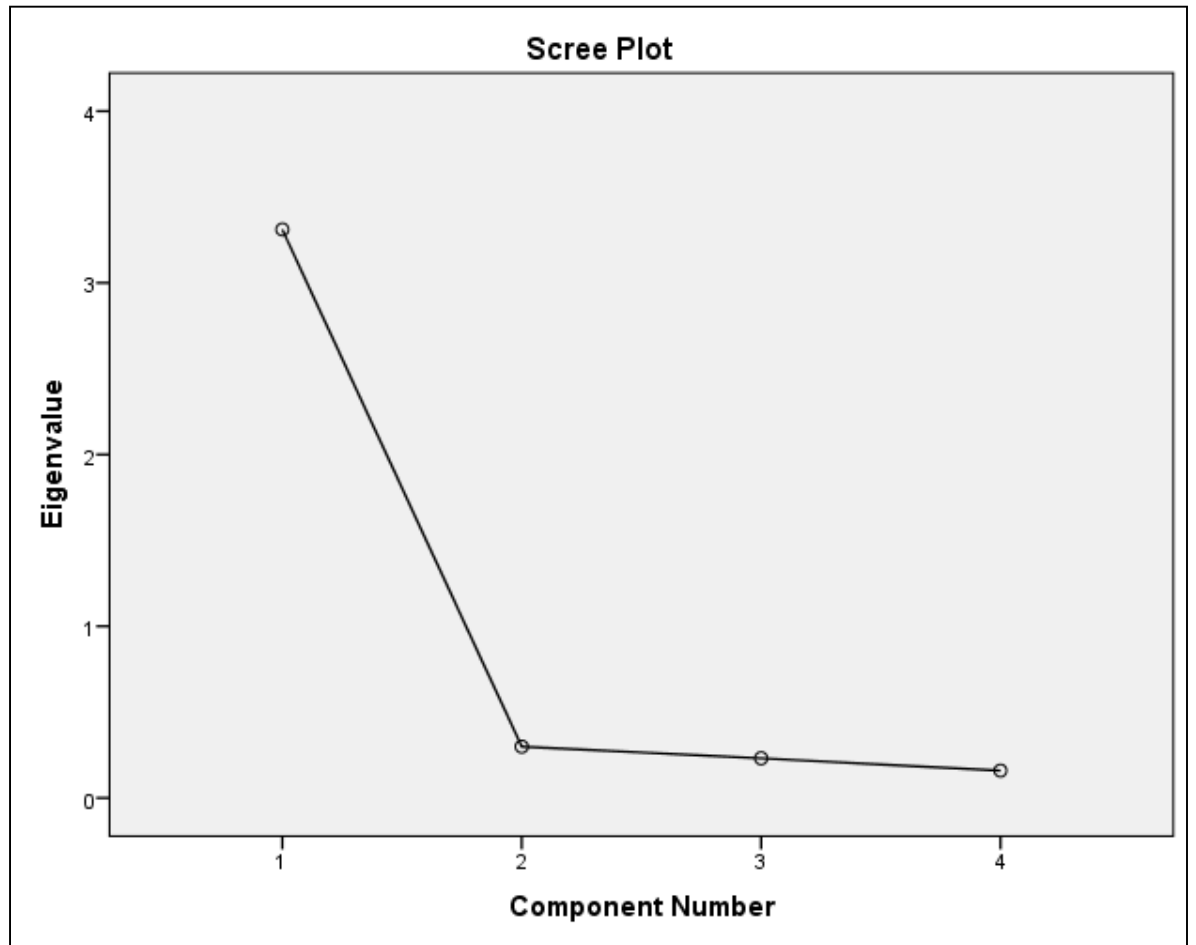


Figure E.13: Scree Plot for Firm Performance (FP)

Table E.38: KMO and Bartlett's Test for Firm Performance (FP)

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.846
Bartlett's Test of Sphericity	Approx. Chi-Square	297.519
	df	6
	Sig.	.000

Table E.39: Firm Performance (FP) Total Variance Explained

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.311	82.763	82.763	3.311	82.763	82.763
2	.299	7.477	90.241			
3	.231	5.777	96.018			
4	.159	3.982	100.000			

Extraction Method: Principal Component Analysis.

APPENDIX F: SELECTED FIRMS IN THE FINANCIAL, ICT AND MANUFACTURING SECTORS

F.1 Firms in the Money, Banking and Finance Sectors (Financial Sector)

#	FIRM	#	FIRM
1	African Banking Corporation Ltd.	55	CIC General Insurance Limited
2	Bank of Africa Kenya Ltd.	56	CIC Life Assurance Limited
3	Bank of Baroda (K) Ltd.	57	Continental Reinsurance Limited
4	Bank of India	58	Corporate Insurance Company Limited
5	Barclays Bank of Kenya Ltd.	59	Directline Assurance Company Limited
6	CFC Stanbic Bank Ltd.	60	East African Reinsurance Comapany Limited
7	Charterhouse Bank Ltd.	61	Fidelity Shield Insurance Company Limited
8	Chase Bank (K) Ltd.	62	First Assurance Company Limited
9	Citibank N. A Kenya	63	GA Life Assurance Limited
10	Commercial Bank of Africa Ltd.	64	GA Insurance Limited
11	Consolidated Bank of Kenya Ltd.	65	Gateway Insurance Company Limited
12	Co-Operative Bank of Kenya Ltd.	66	Geminia Insurance Company
13	Credit Bank Ltd.	67	ICEA LION General Insurance Comapany LTD
14	Development Bank of Kenya Ltd.	68	ICEA LION Life Assurance Comapany Limited
15	Diamond Trust Bank Kenya Ltd.	69	Intra African Assurance Company Limited
16	Dubai Bank of Kenya Ltd.	70	Invesco Assurance Company Limited
17	Ecobank Kenya Ltd.	71	Kenindia Assurance Company Limited
18	Equatorial Commercial Bank Ltd.	72	Kenya Orient Insurance Limited
19	Equity Bank Ltd.	73	Kenya Orient Life Assurance Limited

#	FIRM	#	FIRM
20	Family Bank Limited	74	Kenya Reinsurance Corporation Limited
21	Fidelity Commercial Bank Ltd.	75	Liberty Life Assurance Kenya Limited
22	Fina Bank Ltd.	76	Madison Insurance Company Kenya Limited
23	First Community Bank Limited	77	Mayfair Insurance Company Limited
24	Giro Commercial Bank Ltd.	78	Metropolitan Cannon Life Assurance Limited
25	Guardian Bank Ltd.	79	Occidental Insurance Company Limited
26	Gulf African Bank Limited	80	Old Mutual Life Assurance Company Limited
27	Habib Bank A.G Zurich	81	Pacis Insurance Company Limited
28	Habib Bank Ltd.	82	Pan African Life Assurance Limited
29	Imperial Bank Ltd.	83	Phoenix of East Africa Insurance Company LTD
30	I & M Bank Ltd	84	Pioneer Assurance Comapany Limited
31	Jamii Bora Bank Limited.	85	Prudential Life Assurance Kenya Limited
32	Kenya Commercial Bank Ltd	86	Resolution Insurance Company Limited
33	K-Rep Bank Ltd	87	Saham Assurance Company Kenya Limited
34	Middle East Bank (k) Ltd.	88	Takaful Insurance of African Limited
35	National Bank of Kenya Ltd	89	Tausi Assurance Company Limited
36	NIC Bank Ltd	90	The Heritage Insurance Company Limited
37	Oriental Commercial Bank Ltd	91	The Kenyan Alliance Insurance Company LTD
38	Paramaount Universal Bank Ltd	92	The Jubilee Insurance Company of Kenya LTD
39	Prime Bank Ltd	93	The Monarch Insurance Company Limited
40	Standard Chartered Bank Kenya Ltd	94	Trident Insurance Company Limited

#	FIRM	#	FIRM
41	Trans-National Bank Ltd	95	UAP Insurance Company Limited
42	UBA Kenya Bank Limited	96	UAP Life Assurance Limited
43	Victoria Commercial Bank Ltd	97	Xplico Insurance Company Limited
44	Housing Finance Ltd.	98	Choice Microfinance Bank Limited
45	AAR Insurance Kenya Limited	99	Faulu Microfinance Bank Ltd
46	African Merchant Assurance Company Limited	100	Kenya Women Microfinance Bank Ltd
47	AIG Kenya Insurance Company Limited	101	SMEP Microfinance Bank Ltd
48	APA Insurance Limited	102	Remu Microfinance Bank Ltd
49	APA Life Assurance Limited	103	Rafiki Microfinance Bank Ltd
50	Barclays Life Assurance Kenya Limited	104	Uwezo Microfinance Bank Ltd
51	Britam General Insurance Company(Kenya) LTD	105	Century Microfinance Bank Ltd
52	British American Insurance Company (K) LTD	106	Sumac Microfinance Bank Ltd
53	Cannon Assurance Limited	107	U & I Microfinance Bank Ltd
54	Capex Life Assurance Company Limited	108	Daraja Microfinance Bank Ltd
		109	Caritas Microfinance Bank Ltd

Source: Central Bank of Kenya (CBK) and Insurance Regulatory Authority (IRA)

Websites (www.centralbank.go.ke and <http://www.ira.go.ke/>)

F.1 Firms in the ICT Sector (Application Service Providers)

	FIRM	#	FIRM
1	Accesskenya Group Limited	66	Itek Solutions Limited
2	Adtel Phone Co. Ltd	67	iWayAfrica Kenya Limited
3	Africa Fleet Management Solutions Limited	68	Jadalink Kenya
4	Africa Online	69	Jamii Telecommunications Limited
5	Airtel Networks Kenya Limited	70	JMW Limited
6	Airtouch Connections Limited	71	Karibu Telecom Limited
7	Aja Limited	72	Kasnet Internet Services Limited
8	Alldean Networks Limited	73	Kentrace and Accessories
9	Attain Enterprise Solutions Limited	74	Kinde Engineering Works Limited
10	AU GAB SERVICES	75	Kingsway Autowatch Limited
11	Autoscope International Limited	76	Klass Image Limited
12	Azanuru Technologies Limited	77	Lantech (Africa) Limited
13	BackTrackTechnologies Limited	78	Linkers International Limited
14	Bandwidth & Cloud Services Limited	79	Liquid Telecom Kenya Limited
15	Bandwidth Providers East Africa Limited	80	Lyle Kenya Limited
16	Bell Western Limited	81	Mobile one to one Limited
17	Beneficial Solutions and Technologies Limited	82	Mobile Pay Limited
18	Bersoft Interactive Limited	83	Mobile Telephone Networks Business Kenya Limited
19	Birdseye Auto Track Limited	84	MOUNT KENYA ONLINE
20	Boss Communications Company	85	Nairobinet (K) Limited
21	C Hear (K) Limited	86	Next Generation Networks Telecommunications (EA)

22	Cable One Limited	87	Nia Moja Business Solutions (K) Limited
23	Callkey (E.A) Limited	88	Ninewinds Communications Limited
24	Cellulant Kenya Limited	89	Nirali Enterprises Limited
25	Commcarrrier Satellite Services Limited	90	Ocean Five Telecom Kenya Limited
26	Compfix Data Limited	91	Octopus ICT Solutions Limited
27	Comtec Hosting Solutions Limited	92	Onmobile Kenya Telecoms Limited
28	Converged Information Services Limited	93	Orca Bay Data Solutions Limited
29	Craft Silicon Limited	94	Oyster Enterprises Limited
30	Databit Limited	95	Plans Online (K) Limited
31	Diamond Online Satellite Systems	96	Porting Access (K) Limited
32	Digital Distribution Centre (K) Limited	97	Pwani Telecoms Limited
33	Dr. Wireless Limited	98	Rainbow Network solutions Limited
34	Electronic and Transmission Media Limited	99	Rasmilink
35	Elige Communications Limited	100	Safaricom Limited
36	Ells Limited	101	Sahanet Limited
37	EM Communications Limited	102	Sat Africa Limited
38	Embarq Limited	103	Sea Submarine Communications Limited
39	Emerging Markets Comm. (K) Limited	104	Servtel Communications Limited
40	Enterprises Data Freedom Limited	105	Sisi Comuncations Limited
41	Essar Telecom Kenya Limited	106	SITA
42	Eureka Technical Services Limited	107	Sovaya Communications limited
43	Fanaka Online Limited	108	Speedial Connections Limited
44	Finnet Communications Limited	109	Suuban Enterprises
45	Finserve Africa Limited	110	Telkom Kenya Limited
46	Flex Communications Limited	111	Texas Alarms Kenya Limited

47	Fourth Generation Networks Ltd	112	Tiben Technologies Company Limited
48	Frontier Informatics Limited	113	Total Security Surveillance Limited
49	Frontier Optical Networks Limited	114	Toucan Network Limited
50	Gateway Insurance Company Limited	115	Tracer Limited
51	Gateway Telecommunications (Kenya) Limited	116	Tracesoft Limited
52	Geda Limited	117	Track & Trace Limited
53	Gelati Limited	118	Tuseme Africa Limited
54	GLOCAL DATA SOLUTIONS LIMITED	119	UNIVERSAL CONNECT LIMITED
55	Harun Internation Limited	120	UUNET Kenya Limited
56	Hausraum Limited	121	Uvacorp Technologies Limited
57	Hirani Telecommunication Limited	122	Valleypoint Telecoms Limited
58	Horyal Services Limited	123	VirtualSat Limited
59	Hotego Networks Limited	124	Vision Network Solutions Africa Limited
60	Icon Wireless Limited	125	VOIP Pro(K) Limited
61	Indigo Telecom Limited	126	Wananchi Group Kenya Limited
62	Industrial Technology Trading Company Limited	127	Web Tribe Limited
63	Instaconnect Limited	128	Wifismartzone Solutions
64	Internet Solutions Kenya Limited	129	Wingu Technologies Limited
65	Iphone Global Ltd	130	Xtranet Communications Limited
		131	Zioncell Kenya Limited

Source: Communications Authority of Kenya (CA) Website (<http://www.ca.go.ke/>)

F.3 Firms in the Manufacturing Sector (Large Scale Manufacturing Firms)

Sector: Building, Construction and Mining (15)			
Company	Operation	Company	Operation
Athi River Mining Ltd	Athi River	Kenbro Industries Ltd	Nairobi
Bamburi Cement Limited	Athi River	Kenya Builders & Concrete Ltd	Nairobi
Bamburi Special Products Ltd	Athi River	Krystalline Salt Ltd	Coast
Central Glass Industries Ltd	Nairobi	Malindi Saltworks Ltd	Coast
East Africa Portland Cement Co. Ltd	Athi River	Manson Hart Kenya Ltd	Nairobi
Homa Lime Co. Ltd	Western	Mombasa Cement Ltd	Nairobi
Karsan Murji & Company Limited	Nairobi	Orbit Enterprises Ltd	Athi River
		Saj Ceramics Ltd	Athi River
Sector: Food, Beverages and Tobacco (154)			
Africa Spirits Ltd	Nairobi	Al-Mahra Industries Ltd	Nairobi
Agriener Agricultural Development limited	Nairobi	Alliance One Tobacco Kenya Ltd	Nairobi
Agro Chemical & Food Company Ltd	Nyanza	Alpha Fine Foods Ltd	Nairobi
Belfast Millers Ltd	Nairobi	Alpine Coolers Ltd	Nairobi
Bidco Oil Refineries Ltd	Nairobi	Annum Trading Company Limited	Nairobi
Bio Foods Products Limited	Nairobi	Aquamist Ltd	Nairobi
Breakfast Cereal Company (K) Ltd	Nairobi	Arkay Industries Ltd	Eldoret
British American Tobacco Kenya Ltd	Nairobi	Brookside Dairy Ltd	Nairobi
Broadway Bakery Ltd	Nairobi	Bunda Cakes & Feeds Ltd	Nakuru
Buzeki Dairy Ltd	Coast	Candy Kenya Ltd	Nairobi
C.Czarnikow Sugar(EA) ltd	Nairobi	Capwell Industries Ltd	Nairobi
Cadbury Kenya Ltd	Nairobi	Carlton Products (EA) Ltd	Nairobi
Centrofood Industries Ltd	Nairobi	Chai Trading Company Limited	Coast
Chemelil Sugar Company Ltd	Western	Chirag Kenya Limited	Nairobi
Coast Maize Millers Ltd	Coast	Coast Salt Works Limited	Coast
Coca-Cola East Africa Ltd	Nairobi	Coastal Bottlers Limited	Coast
Confec Industries (E.A) Ltd	Nairobi	Diamond Industries Ltd	Coast
Corn Products Kenya Ltd	Nairobi	Dominion Farms	Western
Crown Foods Ltd	Nairobi	E & A Industries Ltd	Nairobi
Cut Tobacco (K) Ltd	Nairobi	Kakuzi Ltd	Nairobi
Deepa Industries Ltd	Nairobi	Eldoret Grain Mills Ltd	Eldoret
Del Monte Kenya Ltd	Nairobi	Eldoret grains Ltd	Eldoret
East African Breweries Ltd	Nairobi	Equator Bottlers Ltd	Nyanza
East African Sea Food Ltd	Nairobi	Erdemann Co. (K) Ltd	Nairobi
Eastern Produce Kenya Ltd	Nairobi	Excel Chemicals Ltd	Nairobi
Farmers Choice Ltd	Nairobi	Global Tea & Commodities (K) Ltd	Coast
Frigoken Ltd	Nairobi	Gold Crown Beverages	Coast
Giloil Company Limited	Nairobi	Gold Crown Beverages (K) LTD	Coast
Glacier Products Ltd	Nairobi	Gold Crown Foods (EPZ) Ltd	Coast
Global Allied Industries Ltd	Nairobi	Kensalt Ltd	Coast
Global Beverages Ltd	Nairobi	Kenshop Supermarket (TI) Hot Bread	Nyanza
Global Fresh Ltd	Nairobi	Kenya Tea Growers Association	Nyanza
Gonas Best Ltd	Nairobi	Kenya Tea Packers Ltd (KETEPA)	Nyanza
Hail & Cotton Distillers Ltd	Nairobi	Kenya Wine Agencies Limited	Nairobi
Happy Cow Ltd	Nakuru	Keroche Industries Ltd	Nakuru
Highlands Canners Ltd	Nairobi	Kevian Kenya Ltd	Nairobi
Highlands Mineral Water Co. Ltd	Nairobi	Kibos Sugar and Allied Industries	Nyanza
Homeoil	Nairobi	Kisii Bottlers Ltd	Nyanza
Insta Products (EPZ) Ltd	Nairobi	Koba Waters Ltd	Nairobi

Jambo Biscuits (K) Ltd	Nairobi	Kwality Candies & Sweets Ltd	Nairobi
James Finlay Kenya Ltd	Nyanza	Lari Dairies Alliance Ltd	Nairobi
Jetlak Foods Ltd	Nairobi	London Distillers (K) Ltd	Nairobi
Kabianga Dairy Ltd	Nyanza	Mafuko Industries Ltd	Nairobi
Kamili Packers Ltd	Western	Manji Food Industries Ltd	Nairobi
Kapa Oil Refineries Ltd	Athi River	Mastermind Tobacco (K) Ltd	Athi River
Karirana Estate Ltd	Nairobi	Mayfair Holdings Ltd	Nyanza
Kenafic Industries Limited	Nairobi	Melvin Marsh International	Nairobi
Kenblest Limited	Nairobi	Menengai Oil Refineries Ltd	Nakuru
Kenya Breweries Ltd	Nairobi	Kenya Tea Development Agency	Nairobi
Kenya Nut Company Ltd	Nairobi	Milly Fruit Processors Ltd	Coast
Kenya Seed Company Ltd	Eldoret	Mini Bakeries (Nbi) Ltd	Nairobi
Kenya Sweets Ltd	Nairobi	Miritini Kenya Ltd	Nairobi
NesFoods Industries Ltd	Coast	Mombasa Maize Millers Ltd	Coast
Nestle Kenya Ltd	Nairobi	Mount Kenya Bottlers Ltd	Nairobi
Nicola Farms Ltd	Nairobi	Mumias Sugar Company Ltd	Western
Njoro Canning Factory(Kenya) Ltd	Nakuru	Mzuri Sweets Ltd	Coast
Palmac Oil Refiners Ltd	Nakuru	Nairobi Bottlers Ltd	Nairobi
Palmhouse Dairies Ltd	Nairobi	Nairobi Flour Mills Ltd	Nairobi
Patco Industries Limited	Nairobi	Nairobi Mineral Water Co. Ltd	Coast
Pearl Industries Ltd	Nairobi	NAS Airport Services Ltd	Nairobi
Pearly Waters Limited	Coast	Pwani Oil Products Ltd	Coast
Pembe Flour Mills Ltd	Nairobi	Rafiki Millers Ltd	Nairobi
Premier Flour Mills Ltd	Nairobi	Razco ltd	Nairobi
Premier Food Industries Limited	Nairobi	Re-Suns Spices Limited	Nairobi
Proctor & Allan (E.A.) Ltd	Nairobi	Rift Valley Bottlers Ltd	Eldoret
Promasidor (Kenya) Ltd	Nairobi	Sigma Supplies Ltd	Athi River
Trufoods Ltd	Nairobi	Smash Industries Ltd	Nairobi
UDV Kenya Ltd	Nairobi	Softa Bottling Co. Ltd	Nairobi
Unga Group Ltd	Nairobi	Spectre International Ltd	Nyanza
United Millers Ltd	Nyanza	Spice World Ltd	Nairobi
Usafi Services Ltd	Nairobi	Spin Knit Dairy Ltd	Nairobi
Uzuri Foods Ltd	Nairobi	Sunny Processors Ltd	Nairobi
Valley Bakery Ltd	Nakuru	Super Bakery Ltd	Nairobi
ValuePak Foods Ltd	Nairobi	Swan Industries Limited	Nyanza
W. E. Tilley (Muthaiga) Ltd	Nairobi	Swan Millers Ltd	Nyanza
Wanainchi Marine Products (K) Ltd	Coast	Western Kenya Express Suppliers	Western
West Kenya sugar company limited	Western	Wrigley Company (E.A.) Ltd	Nairobi
Sector: Chemical and Allied (71)			
Company	Operation	Company	Operation
Anffi Kenya Ltd	Nairobi	Continental Products Ltd	Nairobi
Basco Products (K) Ltd	Nairobi	Cooper K- Brands Ltd	Nairobi
Bayer East Africa Ltd	Nairobi	Cooper Kenya Ltd	Nairobi
Beiersdorf East Africa Ltd	Nairobi	Crown Berger Kenya Ltd	Nairobi
Blue Ring Products Ltd	Nairobi	Crown Gases Ltd	Nairobi
BOC Kenya Limited	Nairobi	Decase Chemicals (Ltd)	Nairobi
Buyline Industries Ltd	Nairobi	Deluxe Inks Ltd	Nairobi
Carbacid (CO2) Limited	Nairobi	Desbro Kenya Limited	Nairobi
Chemicals & Solvents E. A. Ltd	Nairobi	E.Africa Heavy chemicals (1999) Ltd	Nairobi
Chemicals and Solvents E.A. Ltd	Nairobi	Eastern Chemicals Industries Ltd	Coast
Coates Brothers (E.A.) Limited	Nairobi	Elex Products Ltd	Nairobi
Coil Products (K) Limited	Nakuru	European Perfumes & Cosmetics Ltd	Nairobi

Colgate Palmolive (E.A.) Ltd	Nairobi	Galaxy Paints & Coating Co. Ltd	Nairobi
JohnsonDiversey East Africa Limited	Nairobi	Grand Paints Ltd	Nairobi
Kapi Limited	Nakuru	Henkel Kenya Ltd	Nairobi
Kel Chemicals Limited	Nairobi	Imaging Solutions (K) Ltd	Nairobi
Kemia International Ltd	Nairobi	Interconsumer Products Ltd	Nairobi
Ken Nat Ink & Chemicals Ltd	Nairobi	Odex Chemicals Ltd	Nairobi
Magadi Soda Company Ltd	Nairobi	Orbit Chemical Industries Ltd	Athi River
Maroo Polymers Ltd	Nairobi	Osho Chemicals Industries Ltd	Nairobi
Match Masters Ltd	Nairobi	Pan Africa Chemicals Ltd	Nyanza
Metal Refinery EPZ Ltd	Coast	PolyChem East Africa Ltd	Nairobi
Metoxide Africa Ltd	Athi River	Procter & Gamble East Africa Ltd	Nairobi
Milly Glass Works Ltd	Coast	Pyrethrum Board of Kenya	Nakuru
United Chemical Industries Ltd	Nairobi	PZ Cussons ltd	Nairobi
Oasis Ltd	Nairobi	Rayat Trading Co.Ltd	Nairobi
Rumorth EA Ltd	Nairobi	Reckitt Benckiser (E.A.) Ltd	Nairobi
Rumorth East Africa Ltd	Nairobi	Revolution Stores Co. Ltd	Nairobi
Sadolin Paints (E.A.) Ltd	Nairobi	Rosin Kenya Ltd	Nakuru
Sara Lee Kenya Limited	Nairobi	Soilex Chemicals Ltd	Nairobi
Saroc Ltd	Nairobi	Strategic Industries Limited	Nairobi
Super Foam Ltd	Nairobi	Supa Brite Ltd	Nairobi
Syngenta East Africa Ltd	Nairobi	Unilever Kenya Ltd	Nairobi
Synresins Ltd	Nairobi	Murphy Chemicals E.A Ltd	Nairobi
Tri-Clover Industries (K) Ltd	Nairobi	Vitafoam Products Limited	Nairobi
Twiga Chemical Industries Limited	Nairobi		
Sector: Energy, Electrical and Electronics (43)			
Company	Operation	Company	Operation
A.I Records (Kenya) Ltd	Nairobi	East African Cables Ltd	Nairobi
Amedo Centre Kenya Ltd	Nairobi	Eveready East Africa Limited	Nairobi
Assa Abloy East Africa Ltd	Nairobi	Frigorex East Africa Ltd	Nairobi
Aucma Digital Technology Africa Ltd	Nairobi	Holman Brothers (E.A) Ltd	Nairobi
Avery (East Africa) Ltd	Nairobi	IberaAfrica Power (EA) Ltd	Nairobi
Baumann Engineering Limited	Nairobi	International Energy Technik Ltd	Nairobi
Centurion Systems Limited	Nairobi	Kenwest Cables Ltd	Nairobi
Digitech East Africa Limited	Nairobi	Kenwestfal Works Ltd	Nairobi
Manufacturers & Suppliers (K) Ltd	Nairobi	Kenya Petroleum Refineries Ltd	Coast
Marshall Fowler (Engineers) Ltd	Nairobi	Kenya Power & Lighting Co. Ltd	Nairobi
Mecer East Africa Ltd	Nairobi	Kenya Scale Co. Ltd/Avery Kenya Ltd	Nairobi
Metlex Industries Ltd	Nairobi	Kenya Shell Ltd	Nairobi
Metsec Ltd	Nairobi	Libya Oil Kenya Limited.	Nairobi
Modulec Engineering Systems Ltd	Nairobi	Reliable Electricals Engineers Ltd	Nairobi
Mustek East Africa	Nairobi	Sanyo Armco (Kenya) Ltd	Nairobi
Nationwide electrical industries	Nairobi	Socabelec East Africa	Nairobi
Nationwide electrical Industries Ltd	Nairobi	Sollatek Electronics (Kenya) Limited	Coast
Optimum Lubricants Ltd	Nairobi	Specialised Power Systems Ltd	Nairobi
PCTL Automation Ltd	Nairobi	Synergy-Pro	Nairobi
Pentagon Agencies	Nairobi	Tea Vac Machinery Limited	Eldoret
Power Engineering International Ltd	Nairobi	Virtual City Ltd	Nairobi
Power Technics Ltd	Nairobi		
Sector: Plastics and Rubber (66)			
Company	Operation	Company	Operation
Betatrad (K) Ltd	Nairobi	Doshi Ironmongers Ltd	Coast
Blowplast Ltd	Nairobi	Dune Packaging Ltd	Nairobi

Bobmil Industries Ltd	Nairobi	Elgitread (Kenya) Ltd	Nairobi
Cables & Plastics Ltd	Coast	Elgon Kenya Ltd	Nairobi
Coast Polythene Bags	Coast	Esilon Plastics of Kenya Ltd	Nairobi
Complast Industries Limited	Nairobi	Five Star Industries Ltd	Nairobi
Kenpoly Manufacturers Ltd	Nairobi	General Plastics Limited	Nairobi
Kentainers Ltd	Nairobi	Haco Industries Kenya Ltd	Nairobi
Kenya Suitcase Manufacturers Ltd	Coast	Hi-Plast Ltd	Nairobi
King Plastic Industries Ltd	Nairobi	Jamlam Industries Ltd	Nairobi
Kingsway Tyres & Automart Ltd	Nairobi	Kamba Manufacturing (1986) Ltd	Nairobi
L.G. Harris & Co. Ltd	Nairobi	Keci Rubber Industries	Nairobi
Lanceb Plastics Industries Ltd	Nairobi	Nairobi Plastics Ltd	Nairobi
Metro Plastics Kenya Limited	Nairobi	Nav Plastics Limited	Nairobi
Mombasa Polythene Bags Ltd	Coast	Ombi Rubber	Nairobi
Ombi Rubber Rollers Ltd	Nairobi	Packaging Masters limited	Nairobi
Packaging Industries Ltd	Nairobi	Plastic Electricons	Nairobi
Plastics & Rubber Industries Ltd	Nairobi	Raffia Bags (K) Ltd	Nairobi
Poly Propelin Bags Ltd	Coast	Rubber Products Ltd	Nairobi
Polyblend Limited	Nairobi	Safepak Limited	Nairobi
Polyflex Industries Ltd	Nairobi	Sameer Africa Ltd	Nairobi
Polythene Industries Ltd	Nairobi	Sanpac Africa Ltd	Nairobi
Premier Industries Ltd	Nairobi	Shiv Enterprises (E) Ltd	Eldoret
Prestige Packaging Ltd	Nairobi	Signode Packaging Systems Ltd	Nairobi
Prosel Ltd	Nairobi	Silpack Industries Limited	Nairobi
Pyramid Packaging Ltd	Eldoret	Solvochem East Africa Ltd	Nairobi
Qplast Industries Ltd	Nairobi	Springbox Kenya Ltd	Nairobi
Vyatu Ltd	Nyanza	Sumaria Industries Ltd	Nairobi
Wonderpac Industries Ltd	Nairobi	Super Manufacturers Ltd	Nairobi
Zaverchand Punja Ltd	Coast	Techpak Industries Ltd	Nairobi
ACME Containers Ltd	Nairobi	Treadsetters Tyres Ltd	Nairobi
Afro Plastics (K) Ltd	Nairobi	Umoja Rubber Products Ltd	Coast
Alankar Industries Ltd	Nairobi	Uni-Plastics Ltd	Nairobi
Sector: Textile and Apparels (68)			
Company	Operation	Company	Operation
Africa Apparels EPZ LTD	Nairobi	Fulchand Manek & Bros Ltd	Nairobi
Afro Spin Ltd	Nakuru	Image Apparels Ltd	Nairobi
Alltex EPZ Ltd	Nairobi	J.A.R Kenya [EPZ] Ltd	Nairobi
Alpha Knits Limited	Nairobi	Kamyn Industries Limited	Coast
Apex Apparels (EPZ) Ltd	Nairobi	Kapric Apparels Ltd	Coast
Ashton (Apparel EPZ) Ltd	Coast	Kavirondo Filaments Ltd	Western
Ashton Apparel EPZ Ltd	Coast	Ken-Knit (Kenya) Ltd	Eldoret
Baraka Apparels (EPZ) Ltd	Nairobi	Kenya Knit Garment (EPZ) Ltd	Coast
Bedi Investments Limited	Nakuru	Kenya Shirts Manufacturers Co. Ltd	Coast
Bhupco Textile Mills Limited	Nairobi	Kenya Trading EPZ Ltd	Nairobi
Blue Bird Garments (EPZ) Kenya Ltd	Coast	Kikoy Co. Ltd	Nairobi
Blue Plus Limited	Nairobi	Lalesso Ltd	Coast
Bogani Industries Ltd	Nairobi	Lamsons Industries Limited	Nakuru
Brother Shirts Factory Ltd	Nairobi	Le-Stud Limited	Nairobi
Embalishments Ltd	Nairobi	Leena Apparels Ltd	Coast
Fantex (K) Ltd	Nyanza	Lifeworks Shukrani Limited	Coast
Midco Textiles (EA) Ltd	Nairobi	Londra Limited	Nakuru
Mirage Fashionwear EPZ Ltd	Nairobi	Mega Garment Industries Kenya Ltd	Coast
MRC Nairobi (EPZ) Ltd	Nairobi	Mega Spin Ltd	Nakuru

Nakuru Industries Ltd	Nakuru	Metro Impex Ltd	Nairobi
Ngecha Industries Ltd	Nairobi	Protex Kenya (EPZ) Ltd	Nairobi
Premier Knitwear Ltd	Nairobi	Riziki Manufacturers Ltd	Nairobi
Spin Knit Limited	Nakuru	Rolex Garment EPZ Ltd	Nairobi
Spinners & Spinners Ltd	Nairobi	Rupa Mills Ltd	Eldoret
Squaredeal Uniforms Centre Ltd	Eldoret	Senior Best Garment (EPZ) Ltd	Coast
Storm Apparel Manufacturers Co. Ltd	Nairobi	Shin-Ace Garments Kenya (EPZ) Ltd	Coast
Straightline Enterprises Ltd	Nairobi	Silver Star Manufacturers Ltd	Nairobi
Summit Fibres Ltd	Coast	Sin Lane Kenya (EPZ) Ltd	Coast
Sunflag Textile & Knitwear Mills Ltd	Nairobi	Sino Link Garments (EPZ) Ltd	Coast
Tarpo Industries Limited	Nairobi	Vaja Manufacturers Limited	Nairobi
Teita Estate Ltd	Nairobi	Wildlife Works (EPZ) Ltd	Coast
Thika Cloth Mills Ltd	Nairobi	World of Kikoys	Coast
United Aryan (EPZ) Ltd	Nairobi	Upan Wasana (EPZ) Ltd	Nairobi
Yoochan Kenya EPZ Company Ltd	Nairobi	YU-UN Kenya EPZ Company Ltd	Nairobi
Sector: Timber, Wood Products and Furniture (26)			
Company	Operation	Company	Operation
Comply Industries Ltd	Nakuru	Rai Plywoods (Kenya) Ltd	Eldoret
Economic Housing Group Ltd	Nairobi	Rosewood Office Systems Ltd	Nairobi
Eldema (Kenya) Limited	Nairobi	Shah Timber Mart Ltd	Nairobi
Fine Wood Works Ltd	Nairobi	Shamco Industries Ltd	Nairobi
Furniture International Limited	Nairobi	Slumberland Kenya Limited	Nairobi
Hwan Sung Industries (K) Ltd	Nairobi	Timber Treatment International Ltd	Eldoret
Kenya Wood Ltd	Nairobi	TimSales Ltd	Nairobi
Newline Ltd	Nairobi	WoodMakers Kenya Ltd	Nairobi
PG Bison Ltd	Nairobi	Woodtex Kenya Ltd	Nairobi
Transpaper Kenya Ltd	Nairobi	United Bags Manufacturers Ltd	Nairobi
Twiga Stationers & Printers Ltd	Nairobi	Statpack Industries Ltd	Nairobi
Uchumi Quick Suppliers Ltd	Nairobi	Taws Limited	Nairobi
Uneeco Paper Products Ltd	Coast	Tetra Pak Ltd	Nairobi
Sector: Pharmaceutical and Medical Equipment (32)			
Company	Operation	Company	Operation
African Cotton Industries Ltd	Coast	Dawa limited	Nairobi
Alpha Medical Manufacturers Ltd	Nairobi	Elys Chemicals Industries Ltd	Nairobi
Beta Healthcare International Limited	Nairobi	Gesto Pharmaceuticals Ltd	Nairobi
Biodeal Laboratories Ltd	Nairobi	Glaxo Smithkline Kenya Ltd	Nairobi
Bulk Medicals Ltd	Nairobi	KAM Industries Limited	Nairobi
Cosmos Limited	Nairobi	KAM Pharmacy Limited	Nairobi
Laboratory & Allied Limited	Nairobi	Pharmaceutical Manufacturing Co.	Nairobi
Manhar Brothers (K) Ltd	Nairobi	Regal Pharmaceuticals	Nairobi
Medivet Products Ltd	Nairobi	Revital Healthcare (EPZ) Ltd	Coast
Novelty Manufacturing Ltd	Nairobi	Universal Corporation limited	Nairobi
Oss.Chemie (K)	Nairobi	Pharm Access Africa Ltd	Nairobi
Laboratory & Allied Limited	Nairobi	Pharmaceutical Manufacturing Co.	Nairobi
Manhar Brothers (K) Ltd	Nairobi	Regal Pharmaceuticals	Nairobi
Medivet Products Ltd	Nairobi	Revital Healthcare (EPZ) Ltd	Coast
Novelty Manufacturing Ltd	Nairobi	Universal Corporation limited	Nairobi
Oss.Chemie (K)	Nairobi	Pharm Access Africa Ltd	Nairobi
Sector: Metal and Allied (62)			
Company	Operation	Company	Operation
African Marine & General Engineering	Coast	Athi River Steel Plant Ltd	Athi River
Allied Metals Services Ltd	Nairobi	Booth Extrusions Limited	Nairobi

Alloy Steel Castings Ltd	Nairobi	Brollo Kenya Limited	Coast
Apex Steel Ltd - Rolling Mill Division	Nairobi	City Engineering Works Ltd	Nairobi
ASL Ltd	Nairobi	Cook N Lite Limited	Coast
ASP Company Ltd	Nairobi	Corrugated Sheets Limited	Coast
East African Foundry Works (K) Ltd	Nairobi	Crystal Industries Ltd	Nairobi
Elite Tools Ltd	Nairobi	Davis & Shirtliff Ltd	Nairobi
Farm Engineering Industries Ltd	Nyanza	Devki Steel Mills Ltd	Nairobi
Friendship Container Manufacturers	Nairobi	Doshi Enterprises Limited	Coast
General Aluminium Fabricators Ltd	Nairobi	East Africa Spectre Limited	Nairobi
Gopitech (Kenya) Ltd	Nairobi	Kaluworks Limited	Coast
Greif Kenya Limited	Coast	Kens Metal Industries Ltd	Nairobi
Heavy Engineering Ltd	Nairobi	Kenya General Industries Ltd	Coast
Hobra Manufacturing Ltd	Nakuru	Khetshi Dharamshi & Co. Ltd	Nairobi
Insteel Limited	Nairobi	Kitchen King Ltd	Coast
J. F. McCloy Ltd	Nairobi	Laminate Tubes Industries	Eldoret
Mecol Limited	Nairobi	Mabati Rolling Mills Limited	Athi River
Metal Crowns Limited	Nairobi	Nampak Kenya Ltd	Nairobi
Morris & Co. Limited	Nairobi	Napro Industries Limited	Nairobi
Nails & Steel Products Ltd	Nairobi	Specialised Engineer Co. (EA) Ltd	Nairobi
Narcol Aluminium Rolling Mills Ltd	Coast	Standard Rolling Mills Ltd	Coast
Ndume Ltd	Nakuru	Steel Structures Limited	Nairobi
Orbit Engineering Ltd	Nairobi	Steelmakers Ltd	Nairobi
Rolmil Kenya Ltd	Nairobi	Steelwool (Africa) Ltd	Nairobi
Sandvik Kenya Ltd	Nairobi	Super Steel & Tubes Ltd	Eldoret
Sheffield Steel Systems Ltd	Nairobi	Tarmal Wire Products Ltd	Coast
Soni Technical Services Ltd	Western	Tononoka Steel Ltd	Nairobi
Southern Engineering Co. Ltd	Coast	Tritex Industries Ltd	Coast
Welding Alloys Ltd	Nairobi	Viking Industries Ltd	Nairobi
Wire Products Limited	Nairobi	Warren Enterprises Ltd	Nairobi
Sector: Leather Products and Footwear (8)			
Company	Operation	Company	Operation
Alpharama Ltd	Nairobi	CP Shoes	Nairobi
Bata Shoe Co (K) Ltd	Nairobi	Dogbones Ltd	Nairobi
New Market Leather Factory Ltd	Nairobi	East African Tanners (K) Ltd	Nairobi
C & P Shoe Industries Ltd	Nairobi	Leather Industries of Kenya Limited	Nairobi
Sector: Motor Vehicle Assembly and Accessories (22)			
Company	Operation	Company	Operation
Associated Battery Manufacturers (E.A.)	Athi River	General Motors East Africa Limited	Nairobi
Associated Vehicle Assemblers Ltd	Coast	Impala Glass Industries Ltd	Nairobi
Auto Ancillaries Ltd	Nairobi	Kenya Grange Vehicle Industries Ltd	Nairobi
Auto Spring Manufacturers Ltd	Athi River	Kenya Vehicle Manufacturers Limited	Nairobi
Autofine Filters & Seals Ltd	Eldoret	Labh Singh Harnam Singh Ltd	Nairobi
Varsani Brakelinings Ltd	Nairobi	Mann Manufacturing Co. Ltd	Nairobi
Banbros Ltd	Athi River	Megh Cushion Industries Ltd	Nairobi
Bhachu Industries Ltd	Nairobi	Mutsimoto Motor Company Ltd	Nakuru
Chui Auto Spring Industries Ltd	Nairobi	Pipe Manufacturers Ltd	Nairobi
Toyota East Africa Ltd	Nairobi	Sohansons Ltd	Nairobi
Unifilters Kenya Ltd	Nairobi	Theevan Enterprises Ltd	Nairobi
Sector: Paper and Paperboard (60)			
Company	Operation	Company	Operation
Ajit Clothing Factory Ltd	Nairobi	Conventual Franciscan Friars	Nairobi
AllPack Industries Ltd	Athi River	Creative Print House	Nairobi

Andika Industries Ltd	Western	D. L. Patel Press (Kenya) Limited	Nairobi
Associated Paper & Stationery Ltd	Nairobi	Dodhia Packaging Limited	Nairobi
Autolitho Ltd	Nairobi	East Africa Packaging Industries Ltd	Nairobi
Bag and Envelope Converters Ltd	Nairobi	Elite Offset Ltd	Nairobi
Bags & Balers Manufacturers (K) Ltd	Nairobi	Ellams Products Ltd	Nairobi
Brand Printers	Nairobi	English Press Limited	Nairobi
Business Forms & Systems Ltd	Nairobi	Flora Printers Ltd	Coast
Carton Manufacturers Ltd	Nairobi	General Printers Limited	Nairobi
Cartobox Industries (E.A.) Ltd	Nakuru	Graphics & Allied Ltd	Nairobi
Cempack Ltd	Nairobi	Guaca Stationers Ltd	Nairobi
Chandaria Industries Limited	Nairobi	Icons Printers Ltd	Nairobi
Colour Labels Ltd	Nairobi	Interlabels Africa Ltd	Nairobi
Colour Packaging Ltd	Nairobi	Jomo Kenyatta Foundation	Nairobi
Colourprint Ltd	Nairobi	Kakamega Paper Converters Ltd	Western
Kenya Litho Ltd	Athi River	Kartasi Industries Ltd	Nairobi
Kenya Stationers Ltd	Nairobi	Kenafic Diaries Manufacturers Ltd	Nairobi
Kim-Fay East Africa Ltd	Nairobi	Kitabu Industries Ltd	Nairobi
Paper Converters (Kenya) Ltd	Nairobi	Kul Graphics Ltd	Nairobi
Paper House of Kenya Ltd	Nairobi	L.A.B International Kenya limited	Coast
Paperbags Limited	Nairobi	Label Converters	Nairobi
Phoenix Matches Ltd	Western	Modern Lithographic (K) Ltd	Nairobi
Primex Printers Ltd	Nairobi	Nation Media Group Ltd	Athi River
Print Exchange Ltd	Nairobi	National Printing Press Limited	Nyanza
Printpak Multi Packaging Ltd	Nairobi	Packaging Manufacturers (1976) Ltd	Coast
Printwell Industries Ltd	Nairobi	Pan African Paper Mills (E.A) Limited	Nairobi
Prudential Printers Ltd	Nairobi	Regal Press Kenya Ltd	Nairobi
Punchlines Ltd	Nairobi	Rodwell Press Ltd	Coast
Ramco Printing Works Ltd	Nairobi	SIG Combibloc Obeikan Kenya	Nairobi

Source: Kenya Association of Manufacturers (KAM) Directory, June, 2011