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Determinants of Software as a Service adoption by Nairobi Securities Exchange listed companies.

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DETERMINANTS OF SOFTWARE AS A SERVICE ADOPTION BY NAIROBI SECURITIES EXCHANGE LISTED COMPANIES

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DECLARATION

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

Moses Aluodo
2022

Approval

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ABSTRACT

Software as a Services (SaaS) is a revolutionary licensing and distribution model used to deliver software applications over the Internet. It is a compelling value proposition for customers who are keen to avoid tying high capital expenditure that characterizes implementation of on-premise business applications. It presents customers with the option of pay-as-you-go operating expenditure model as opposed to large upfront capital expenditure. Despite the economics and other adoption facilitators of SaaS, the uptake continues to face an almost similar number of adoption inhibitors. The study sought to investigate the relationships between SaaS Adoption Facilitators and SaaS Adoption Inhibitors on the one hand and SaaS Adoption by Nairobi Securities Exchange (NSE) listed companies on the other. It also sought to establish the SaaS Adoption Psychographic Profiles of NSE listed companies and the relationship with SaaS Adoption, that exist. Rogers' Diffusion of Innovations (DOI) Theory and modified Technology, Organization and Environment (TOE) Framework were used as baseline theoretical frameworks to undertake the study. The study adopted a census approach given the relatively small number of NSE listed companies, to eliminate any element of chance and obtain the highest accuracy. An Internet-mediated questionnaire was administered to the IT leadership of these companies via SurveyMonkey and data obtained was analyzed using both descriptive and inferential statistics, to test significant relationships between the independent variables and the dependent variable. Using Spearman's rank correlation coefficient (Spearman's rho) to assess relationships between independent variables and the dependent variable, the study found that all the SaaS Adoption Facilitators had moderately positive to very strong positive relationships with SaaS Adoption, all the SaaS Adoption Inhibitors had weak negative relationships with SaaS Adoption, with the exception of Integration Challenges which had a moderately negative relationship with SaaS Adoption. The SaaS Adoption Psychographic Profiles established had a moderately positive relationship with SaaS Adoption. Of the SaaS Adoption Psychographic Profiles established, not a single Laggard was found in the population.

Key words: *Software as a Service, SaaS Adoption Facilitators, SaaS Adoption Inhibitors, SaaS Adoption Psychographic Profiles, Diffusion of Innovations.*

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DEDICATION

To my loving wife Yvonne and our children Ed, Ty and Al.

ABBREVIATIONS AND ACRONYMS

CA	Communication Authority of Kenya
CIO	Chief Information Officer
DARE	Djibouti Africa Regional Express submarine cable
DOI	Diffusion of Innovations Theory
ERP	Enterprise Resource Planning
EASSy	Eastern Africa Submarine System
HBR	Harvard Business Review
ICT	Information and Communication Technology
IT	Information Technology
KNBS	Kenya National Bureau of Statistics
LION2	Lower Indian Ocean Network II submarine cable
NACOSTI	National Commission for Science Technology and Innovation
NBS	National Broadband Strategy
NOFBI	National Optical Fibre Network Backhaul Initiative
NSE	Nairobi Securities Exchange
PEACE	Pakistan & East Africa Connecting Europe submarine cable
SaaS	Software as a Service
SEACOM	SEACOM submarine cable
SMEs	Small and Medium Enterprises
TEAMS	The East Africa Marine Cable System
TOE	Technology, Organization and Environment Framework
TCO	Total Cost of Ownership
UNCTAD	United Nations Conference on Trade and Development

DEFINITION OF KEY TERMS

Diffusion of Innovations

Diffusion of Innovations is a theory that describes the spread of new innovations through social systems as they are adopted or rejected by individuals or organizations (Rogers, 2003).

Psychographic Profiles

These are combinations of psychology and demographics that make a group's marketing responses different from those of the other groups. There are five psychographic profiles: innovators, early adopters, early majority, late majority and laggards (Moore, 2014).

SaaS Adoption Facilitators

These are factors that motivate the uptake of SaaS by companies owing to the overwhelming business outcomes presented compared to their existing legacy on-premise applications (Vorisek, 2004).

SaaS Adoption Inhibitors

These are factors that dissuade and/or hold back companies from adopting SaaS, so that they instead continue using their on-premise legacy applications (Lee et al., 2013).

Software as a Service

This is a licensing and distribution model used to deliver software applications over the Internet i.e., as a service (Salesforce, 2021).

Software as a Service Adoption

This refers to active and purposeful use of subscription-based applications hosted in the cloud as opposed to on-premise license-based applications.

CHAPTER 1: INTRODUCTION

1.1. Introduction

This chapter introduces the overall study topic, background of the study, brief overview of Software as a Service (SaaS) facilitators, inhibitors and psychographic profiles (adopter categories), statement of the research problem, research objectives and questions, scope and significance of the study.

1.2. Background of the Study

The Covid-19 pandemic has validated the value proposition of cloud computing and has served as a multiplier for Chief Information Officers' (CIOs') interest in the cloud; worldwide end-user spending on public cloud services is forecast to grow 20.4% in 2022 to total $494.7 billion, up from $410.9 billion in 2021 (Gartner, 2022). Of all cloud offerings, software-as-a-service (SaaS) remains the largest market segment and is forecast to grow to $176.6 billion in 2022, as organizations increase investments in mobility, collaboration, and other remote working technologies (Gartner, 2022). According to the same Gartner report, the proportion of IT spending that is shifting to the cloud will accelerate in the aftermath of the COVID-19 pandemic, with cloud projected to make up 14.2% of the total global enterprise IT spending market in 2024, up from 9.1% in 2021. Idris (2020) writes that international cloud companies have rushed to develop data centers on the African continent: IBM announced its first Africa data centre in 2016; in 2019, Huawei started construction of two data centers in South Africa with further plans to expand to Nigeria and Kenya; in the same year 2019, Microsoft launched its first Azure data centre in Cape Town and Johannesburg, both in South Africa; in February 2019, the US company also signed an agreement with Telecom Egypt to develop and expand Microsoft cloud facilities to the region; in April 2019, Amazon Web Services launched three data centre operations in Cape Town, its first ever in the African region.

Back home, CA (2020) through the National Broadband Strategy (NBS), 2018-2023, is very strong on open access and net neutrality, policies which are fundamental to ensuring customers' choice of cloud applications while preserving the ability of the entire Internet ecosystem to innovate. Specifically, the net-neutrality principles outlined in the NBS, 2018-2023 are: no blocking or throttling, no paid prioritization or fast lanes, reasonable traffic management, technological

neutrality and transparency, all of which are critical for SaaS (and other cloud offerings) adoption. In 2019, the Distributed Ledgers Technology and Artificial Intelligence Taskforce recommended a government cloud to provide governance and services on demand. The report asserts that government services should be available in real time from online and mobile platforms; this will ensure that all citizen entitlements are available in the cloud for easy access, thereby digitally empowering citizens with universal access. All the frenzy mentioned above, the policy pronouncements and recommendations, are because of the business imperatives and efficient citizen services that cloud computing presents to providers/government on the one hand and customers/citizens on the other.

Companies listed in the Nairobi Securities Exchange have a foundational obligation towards their shareholders, to return significant earnings and/or growth to shareholders' capital. It is important, therefore, that they focus on their "core" activities, as opposed to "context" ones that do not give them any competitive advantage. Moore (2014), makes a great distinction between core and context activities: "Core" is any activity that creates sustainable differentiation for a company in the target market resulting in premium prices or increased sales volume. Core management seeks to outperform all competitors within the domain of core dramatically. "Context", on the other hand, is any activity that does not differentiate the company from the customer's viewpoint in the target market. Context management seeks to meet, but not exceed, appropriate accepted standards in a productive manner as possible (Moore, 2014).

SaaS, in particular, has many business imperatives to companies that dare take the cloud journey; some of the benefits are: more frequent (and potentially less painful) upgrades, a lower total cost of ownership (almost up to 30% less), and a higher level of service from vendors that must become more responsive to customer needs or risk losing subscription revenues (Ricci and Wiese, 2011). On the other hand, there are several inhibitors that continue to slow down the uptake of SaaS: security concerns, interoperability and integration challenges, cost of changing from current systems, investment in existing on-premise software licenses, compliance requirements, having to manage multiple services from SaaS providers, network bandwidth limitations, fear of vendor lock-in, cost of cloud services and performance limitations (HBR, 2015).

According to CA (2016) Enterprise ICT Survey on cloud computing adoption, Flexibility (77.3 per cent) was the most cited benefit realized by enterprises followed by cost savings (61.1 per cent). Greater business focus ("core" versus "context") and improved security were perceived as the

least benefit as reported by 23.2 per cent and 16.6 per cent of the enterprises, respectively. On the other end of the adoption continuum in the same report, large firms expressed security concerns as one of the main reasons for not deploying cloud services while 42.4 per cent of micro enterprises cited insufficient knowledge within the organisation as a major hindrance to cloud computing adoption. Arising from this survey, security was perceived as both a benefit and a barrier, depending on the organization size.

Moore (2014), building on Rogers' (2003) Diffusion of Innovations Theory, outlines five different responses to disruptive innovations like SaaS as: "Just try it" – these are the techies or innovators; "Get ahead of the herd" – these are the visionaries or early adopters; "Stick with the herd" – these are the pragmatists or early majority; "Stick with what's proven" - these are the conservatives or late majority; and "Just say no" – these are the skeptics or laggards. According to Rogers (2003), the underlying thesis of the Diffusion of Innovations Theory is that technology is absorbed into any given community in stages corresponding to the psychological and social profiles of various segments within that community. This process can be thought of as a continuum with definable stages, each associated with a definable group, and each group making up a definable portion of the whole (Moore, 2014). While the perception of the NSE listed companies is that of "innovators" or "early-adopters" of innovations like SaaS, the reality may contradict this perception owing to the inherent varying psychographic profiles of each NSE listed company that affect the overall pace of SaaS diffusion within the population.

1.2.1. NSE: A Brief Overview

The Nairobi Securities Exchange (NSE) is a leading African Exchange, based in Kenya and one of the fastest-growing economies in Sub-Saharan Africa. Founded in 1954, NSE has a six-decade heritage in listed equity and debt securities. It offers a world-class trading facility for local and international investors looking to gain exposure to Kenya and Africa's economic growth (NSE, 2022). NSE is playing a vital role in the growth of Kenya's economy by encouraging savings and investment, as well as helping local and international companies access cost-effective capital (NSE, 2022). NSE operates under the jurisdiction of the Capital Markets Authority of Kenya. It is an affiliate of the World Federation of Exchange, a founder member of the African Securities Exchanges Association and the East African Securities Exchanges Association (NSE, 2022). Companies listed in the Nairobi Securities Exchange are in the following categories:

Table 1.1 NSE Listing Categories and Distribution

NSE Listing Categories	Number of Companies
Agricultural	6
Automobiles & Accessories	1
Banking	10
Commercial & Services	13
Construction & Allied	5
Energy & Petroleum	4
Insurance	6
Investment	5
Investment Services	1
Manufacturing & Allied	8
Telecommunications	1
Real Estate Investment Trust	1

Source: Nairobi Securities Exchange (2022)

1.2.2. Kenya's Digital Economy

The National Broadband Strategy, 2018–2023, envisages Kenya as a globally competitive knowledge-based society enabled by secure and fast broadband connectivity. It further defines broadband as "connectivity that delivers interactive, secure, quality and affordable services at a minimum speed of 2Mbps to every user in Kenya." According to Communications Authority of Kenya 2019-2020 Annual report, ICT grew at a rate of 9 per cent, Mobile penetration grew from 91.6 per cent to 119.7 percent per 100 inhabitants while Internet penetration, Broadband penetration and Mobile Money penetration stood at 87.2 percent, 47.7 percent and 64.1 percent respectively. According to the same report, the total available International Internet bandwidth capacity grew to 7,392.0 Gbps from 4,707.5 Gbps recorded as at the end of FY 2018/19. Under Kenya Vision 2030, Infrastructure is one of the key foundations and enablers of the social, economic and political pillars that aim to transform Kenya into a newly industrializing, middle-income country providing a high quality of life to all its citizens by 2030. According to KNBS (2022) Economic Survey 2022, digital connectivity was accelerated by the COVID-19 pandemic as the local markets sought alternative means of procuring goods and services. In response to supply chain disruptions caused by the pandemic, the Information and Communication Technology (ICT)

sector accelerated innovation which in turn increased the uptake of online services. Consumers and businesses opted for online channels resulting in faster growth of the ICT sector at a time when activities in a number of sectors remained subdued. In 2021, the uptake of most of the ICTs such as mobile telephony services and broadband returned to a modest growth compared to 2020. The value of output from ICT sector rose by 6.9 per cent from KSh 529.8 billion in 2020 to KSh 566.3 billion in 2021. (KNBS, 2022).

According to the CA (2022) Kenya National Digital Masterplan, 2022 – 2032, Kenya boasts of being one of the most connected countries on the Eastern Coast of Africa. There are six submarine cables and 8900 Km of Backbone, Metro and last mile connectivity that cut across the country as well as various Private sector connectivity. According to the same Masterplan, there are six submarine cables namely, TEAMS, EASSy, SEACOM, DARE, PEACE and LION2, that offer connectivity to the rest of the world via redundant routing. Further, some of the flagship programmes already identified and being executed as per the Masterplan are: installation of 100,000km of high speed fiber optic infrastructure to provide Internet to all schools, government institutions and offices, metro-cities, health facilities, rural businesses, homes and public spaces; establishment of 25,000 Internet-hotspots across the country to provide Internet services to innovators, youth and entrepreneurs; and establishment of Cloud Services for government and private sector. High-speed and high-capacity broadband is a key enabler of SaaS adoption, as such, Kenya as a country, and indeed companies listed at the Nairobi Securities Exchange, are well placed to leverage SaaS and other Cloud Computing offerings given Kenya's current digital economy (Orinde, 2019).

1.2.3. Listed Companies and Technology Adoption

Omollo (2020) recommended that NSE listed manufacturing companies should focus on enhancing their technological innovation adoption, besides liquidity positions and management efficiency, as these three had a significant influence on their firm value. Her underpinning hypothesis was that adoption of technological innovations improves operational efficiencies, exploration and identification of new revenue streams which in turn improve firm value and performance. On the other hand, Olaniran et al., (2016) study on the role of technology innovation adoption on the performance of listed companies in Nigeria found a negative relationship between technology innovation adoption and returns on assets, and returns on equity. This finding would feed into the hardline positions of the late majority and laggards, and validate why they should

continue holding back on technology adoption and wait till there is manifest business benefits and outcomes that accrue from technology adoption. The expansive footprints of NSE listed companies in Kenya and the East Africa region disposition them to adopt cloud computing, specifically software-as-a-service, to support an increasingly mobile workforce that wants to work from anywhere, anytime and on any device (Kituku, 2012). Kituku (2012) further opines that NSE listed companies are industry leaders in a number of ways, one of them being technology adoption, and that their non-listed smaller peers look up to them on technology adoption and best practices.

1.2.4. SaaS Adoption Facilitators

UNCTAD (2013) identifies facilitators for SaaS adoption as: reduced costs for rented IT hardware and software compared to in-house equipment and IT management; enhanced elasticity of storage and processing capacity as required by demand; greater flexibility and mobility of access to data and services; immediate and cost-free upgrading of software; enhanced reliability and security of data management and services. Vorisek (2004) research on SaaS adoption cites the drivers and triggers of SaaS adoption as: high cost of on-premise IT projects, fast rate of technology change, high demand of IT skills, complexity of on-premise ERP systems, globalization of business environment and increased acceptance of cloud computing - organizations are increasingly aware of the need to focus on their “core” business, and are prepared to consider outsourcing other “context” business functions, including their ERP applications. Salesforce (2021), an American technology company and a pioneer in the SaaS industry, highlights the facilitators of SaaS adoption as: low setup and infrastructure costs, accessibility from anywhere, rapid implementation faster than in-house IT implementations, scalability that allows per-use and avoids idle capacity, industry-leading service level agreements for uptime and performance, automatic and frequent updates, timely improvements are provided automatically by the vendor, informed by user feedback, security at the highest level required by any customer, provided by the vendor.

1.2.5. SaaS Adoption Inhibitors

On the opposite side of the SaaS adoption continuum are the inhibitors that slow down the uptake of SaaS. Madisha (2012) identified these as: lack of awareness, limited customization, vendor lock-in, integration problems, lack of open standards, perceived security concerns, poor

telecommunications infrastructure. He recommended enhanced awareness campaigns and education by the SaaS vendors to increase the pool of SaaS skills and address the major security concerns and other inhibitors that were holding back potential SaaS customers. UNCTAD (2013) identified and classified inhibitors in developing countries as internal and external, internal inhibitors being: concerns related to the security and privacy of data, concerns over the geographical location of data including backups, concerns related to the reliability of service, concerns related to the non-availability of suitable terminal devices, concerns related to the migration of data and risk of vendor lock-in and costs of transition from on-premise systems to the cloud; external inhibitors being: inadequate infrastructure and broadband affordability, legal and regulatory barriers, weaknesses in the wider business environment like lack of ICT skills and lack of awareness of the business imperatives of cloud computing.

1.2.6. SaaS Adoption Psychographic Profiles

Rogers' (2003) diffusion model indicates that a population can be broken down into five different adopter categories, based on their aversion to risk and propensity to adopt a specific innovation: innovators, early adopters, early majority, late majority and laggards. Each group has its own "personality", hence propensity to adopt a new technology innovation like SaaS. Innovators (2.5%) are adventurous and willing to take risks. They fundamentally want to be the first to try new things. Their goal is to explore new technologies or innovations and find opportunities to be an agent of change (Rogers, 2003).

Early Adopters (13.5%) buy new technology to achieve a revolutionary breakthrough that will give them a dramatic competitive advantage in their industry. They love getting an advantage over their peers (Rogers, 2003). Early Majority (34%) typically value innovations that solve a specific problem. They look for complete products that are fully tested, adhere to industry standards, and are used by others they know in their industry. They are looking for incremental, proven ways of doing what they already do (Rogers, 2003).

Late Majority (34%) are risk averse and only adopt new innovations to avoid the embarrassment of being left behind. Change is unsettling to this group so they look for high levels of support and standards certification (Rogers, 2003). Laggards (16%) hold out to the bitter end. They value traditional methods of doing things and refuse to adopt a new technology until they are forced to through obsolescence of their former system. The only time they ever buy a new product is when

their traditional way of doing something has failed and cannot be repaired. Laggards are very skeptical of change and are the hardest group to bring on board (Rogers, 2003).

De Wet (2018) leveraging Rogers' Diffusion of Innovations Theory to study SaaS adoption by SMEs in South Africa, established that if any company was to adopt SaaS at the point of the study, it would fall in the late majority adopter category; the adoption curve had peaked given that 53% of the business applications used by the companies in the study were of SaaS nature.

1.3. Statement of the Problem

Software as a Service and Cloud Computing have, in equal measure, attracted diverse researchers and scholars – students, faculty, journalists and regulators, and world bodies like the United Nations. Of the literature reviewed, there has been disproportionate research work done on Cloud Computing and SaaS adoption by SMEs (Majengo and Mbise, 2022; Njaaga, 2019; Mwaniki & Ondiek, 2018; Tiren, 2017; Ondiek, 2016; Oduor, 2016; Bitta, 2012; Madisha, 2012). Locally only Kituku (2012) undertook a study on cloud computing adoption by NSE listed companies. This study, therefore, sought to bridge the paucity of research done on cloud computing, specifically SaaS adoption, by NSE listed companies as population. Kituku (2012) study on cloud adoption by NSE listed companies focused on ICT managers' attitudes towards cloud computing, functions which had been moved to the cloud and challenges faced by them during migration to the Cloud. He recommended further research on inhibitors of cloud computing adoption, precisely one of the objectives that this study sought to investigate. UNCTAD (2013) found that while the adoption of cloud services in developing countries is motivated by more or less the same basic drivers (facilitators) that attract organizations in developed countries, there were significant barriers (inhibitors) that were more acute in developing economies. Depending on the country, these include insufficient broadband connectivity, high costs for broadband access and use, unreliable power supply, long distances to data centers (with higher latency as a result), a lack of skills to make effective use of ICTs and inadequate legal protection of data (UNCTAD, 2013). Of all the studies reviewed on cloud computing and SaaS adoption in Kenya, none sought to establish the psychographic profiles of the target population and the resultant relationship with adoption. Being cognizant of the paucity of research on SaaS adoption psychographic profiles, this study, therefore, sought to fill the empirical gap by contributing to the cloud computing and SaaS adoption body of knowledge in Kenya by establishing the SaaS adoption psychographic profiles of NSE listed companies and investigating the correlation with SaaS adoption.

1.4. Overall Objective of the Study

The overall objective of the study was to investigate the determinants of SaaS adoption and the relationships they have with SaaS Adoption by NSE listed companies.

1.4.1. Specific Objectives of the Study

The specific objectives of the research are:

1. To investigate the relationships between Software-as-a-Service Adoption Facilitators and Software-as-a-Service Adoption by Nairobi Securities Exchange listed companies.
2. To investigate the relationships between Software-as-a-Service Adoption Inhibitors and Software-as-a-Service adoption by Nairobi Securities Exchange listed companies.
3. To investigate the relationship between Software-as-a-Service Adoption Psychographic Profiles and Software-as-a-Service Adoption by Nairobi Securities Exchange listed companies.

1.5. Research Questions

The research questions are as follows:

1. What relationships exist between Software-as-a-Service Adoption Facilitators and Software-as-a-Service Adoption by Nairobi Securities Exchange listed companies?
2. What relationships exist between Software-as-a-Service Adoption Inhibitors and Software-as-a-Service Adoption by Nairobi Securities Exchange listed companies?
3. What relationship exists between Software-as-a-Service Adoption Psychographic Profiles and Software-as-a-Service Adoption by Nairobi Securities Exchange listed companies?

1.6. Significance of the Study

There have been a number of studies done on general cloud computing adoption, by small and medium enterprises, industry segments and governments, however, few have focused on NSE listed companies, more so of the studies reviewed, none sought to establish psychographic profiles and propensity to adopt Software-as-a-Service of their populations. This research, therefore, sought to go beyond the general research of clouding computing phenomenon and instead focused on Software-as-a-Service (SaaS), which is one limb of cloud computing besides Infrastructure-as-a-Service (IaaS) and Platform-as-a-Service (PaaS). It sought to investigate the relationships between the SaaS adoption facilitators, SaaS adoption inhibitors, SaaS adoption psychographic profiles on the one hand and SaaS adoption by NSE listed companies on the other.

Software-as-a-Service providers will be able to use the findings on SaaS adoption psychographic profiles of the NSE listed companies to tailor their messaging for better market penetration and growth, given that the adopter categories' marketing responses are different. The findings on the facilitators and inhibitors of adoption can be used by relevant government regulatory institutions, especially Communication Authority of Kenya (CA) to influence legislation and policy formulation that would facilitate frictionless journey to the cloud. The research is a source of reference information for future researchers and students on cloud computing adoption, specifically Software-as-a-Service adoption, in Kenya.

1.7. Scope of the Research

The scope of the research was to investigate the relationships between Software-as-a-Service adoption facilitators, inhibitors, psychographic profiles as the independent variables and Software-as-a-Service adoption (dependent variable) by Nairobi Securities Exchange listed companies. Although there are many facilitators and inhibitors of SaaS adoption, the study limited the scope to five facilitators (Financial Advantage, Solution Scalability, Top Management Support, Rapid Deployment and Industry Pressure) and five inhibitors (Connectivity Constraints, Limited Customization, Security Concerns, Integration Challenges and Vendor Lock-in). The reason for the selection of the facilitators and inhibitors is because past reviewed studies, mainly from outside Kenya and targeting SMEs, had shown positive correlation between the facilitators and SaaS adoption, and negative correlation between the inhibitors and SaaS adoption. This study, therefore, sought to confirm or disconfirm these relationships with respect to NSE listed companies. The study also sought to establish the SaaS adoption psychographic profiles of NSE listed companies using a modified Scales for Measurement of Innovativeness by Hurt et al., (1977). The theoretical scope of the study was limited to Diffusion of Innovations (DOI) theory and Technology, Organization and Environment (TOE) Framework. The study methodological scope focused on using quantitative approach in investigating the relationships between the independent variables and the dependent variable.

CHAPTER 2: LITERATURE REVIEW

2.1. Introduction

The chapter presents a critical review of relevant literature to SaaS adoption. The chapter presents theoretical as well as empirical reviews of literature related to SaaS adoption. The hypotheses around the SaaS Adoption Facilitators, SaaS Adoption Inhibitors and SaaS Adoption Psychographic Profiles are formulated out of the empirical literature review. A critique of the literature reviewed and a summary of the research gaps that justified this study is then presented. Finally, a conceptual framework that operationalizes the research variables is presented as well as the operationalization of the variables.

2.2. Theoretical Review

2.2.1. Diffusion of Innovation Theory

Diffusion of Innovations (DOI) is a theory popularized by Ohio State Professor Everett Rogers, that explains how, why, and the rate at which an innovation spreads through a population or social system. An innovation is a product, service, or idea that is perceived as new by an individual or other unit of adoption like an organization (Rogers, 2003).

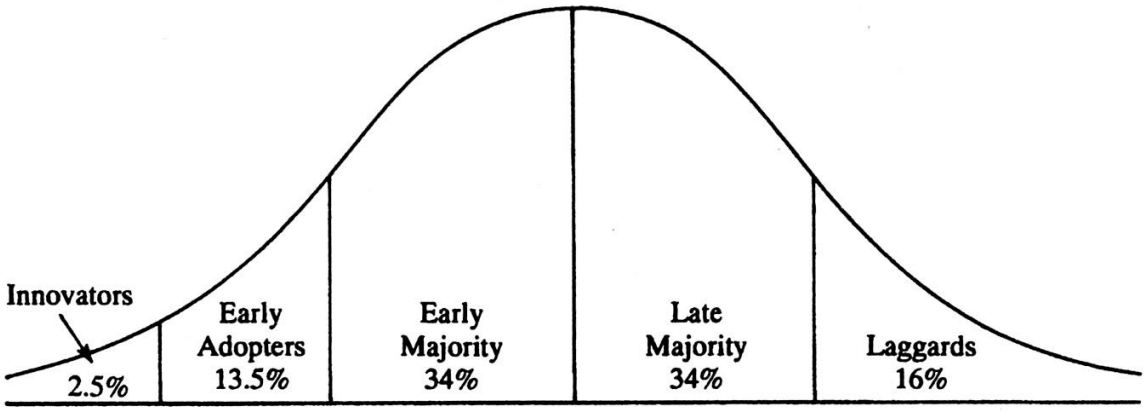

Figure 2.1 Diffusion of Innovations Psychographic Profiles

Source: Rogers (2003)

2.2.1.1. Psychographic Profiles (Adopter Categories)

Diffusion of Innovations theory describes the market penetration of any new technology product in terms of a progression in the type of customers it attracts throughout its useful life. The adopter

categories are distinguished from each other by their characteristic response to a discontinuous innovation based on a new technology (Rogers, 2003). Each group represents a unique psychographic profile – a combination of psychology and demographics that makes its marketing responses different from those of the other groups. Understanding each profile and its relationship to its neighbours provides a critical foundation for high-tech marketing (Moore, 2014). Innovators always want to be the first to try the innovation. They are venturesome and interested in new ideas and innovations. They are willing to take risks, and are often the first to develop new ideas and innovations. Very little, if anything, needs to be done to appeal to this population or market segment (Moore, 2014).

Early adopters represent opinion leaders. They enjoy leadership roles, and embrace change opportunities. They are already aware of the need to change and so are very comfortable adopting new ideas. Strategies to appeal to this population or market segment include how-to manuals and information sheets on implementation. They do not need information to convince them to change (Moore, 2014). Early majority are rarely leaders, but they do adopt new ideas and innovations before the average person. That said, they typically need to see evidence that the innovation works before they are willing to adopt it. Strategies to appeal to this population (or market segment) include success stories and evidence of the innovation's effectiveness (Moore, 2014). Late majority are skeptical of change, and will only adopt an innovation after it has been tried by the majority. Strategies to appeal to this population include information on how many other organizations (or people) have tried the innovation and have adopted it successfully (Moore, 2014). Laggards are bound by tradition and are very conservative. They are very skeptical of change and are the hardest group to bring on board. Strategies to appeal to this population (or market segment) include statistics, fear appeals, and pressure from organizations in the other adopter groups (Moore, 2014).

2.2.1.2. Perceived Attributes of Innovations

In Diffusion of Innovations Theory, Rogers (2003) outlines five main attributes that influence adoption of an innovation, and each of these attributes is at play to a different extent in the five psychographic profiles or adopter categories: Relative Advantage refers to “the degree to which an innovation is seen as better than the idea, program, or product it is replacing” (Rogers, 2003). Compatibility refers to “how consistent the innovation is with the values, experiences, and needs of the potential adopters” (Rogers, 2003). Often times, relative advantage has a positive influence

on diffusion of innovation (Amini & Bakri, 2015). Compatibility of an innovation positively influences the speed of adoption in a society. An innovation, which is compatible with the norms and values of individuals or with norms of a social system, spreads faster than an innovation, which is not compatible (Amini & Bakri, 2015). Complexity refers to "how difficult the innovation is to understand and/or use". Usually, complexity has a negative effect on diffusion. This means that a more complex innovation has less chance to be successfully diffused in the society (Rogers, 2003). Trialability is the degree to which an innovation may be experimented with on a limited basis. New ideas that can be tried on installment plan will generally be adopted more quickly than innovations that are not divisible (Rogers, 2003). Observeability is the degree to which the results of an innovation are visible to others. The easier it is for individuals (and organizations) to see results of an innovation, the more likely they are to adopt, because visibility stimulates peer discussions (Rogers, 2003).

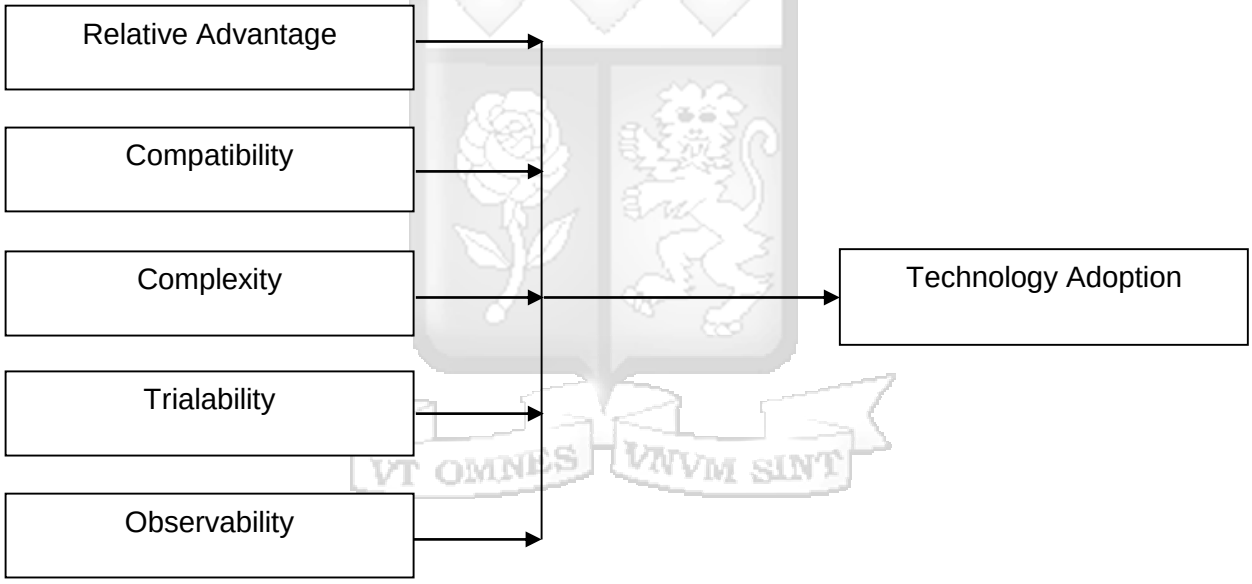

Figure 2.2 Perceived Attributes of Innovations

Source: Rogers (2003)

2.2.1.3. Five Stages in the Innovation Decision Process

Rogers (1962) identifies five stages (steps): awareness, interest, evaluation, trial, and adoption, as integral to the Innovation Diffusion Theory. In later editions of Diffusion of Innovations Theory, Rogers (2003) changes his terminology of the five stages to: knowledge, persuasion, decision, implementation, and confirmation. However, the descriptions of the categories have remained similar throughout the editions (Newell, 2001): Knowledge – occurs when an individual or other

decision-making unit is exposed to an innovation's existence and gains an understanding of how it functions (Rogers, 2003). Persuasion – occurs when an individual or other decision-making unit forms a favourable or an unfavourable attitude towards the innovation (Rogers, 2003). Decision – takes place when an individual or other decision-making unit engages in activities that lead to a choice to adopt or reject the innovation (Rogers, 2003). Implementation – occurs when an individual or other decision-making unit puts a new idea into use (Rogers, 2003). Confirmation – takes place when an individual or other decision-making unit seeks reinforcement of an innovation-decision already made, but he or she may reverse this previous decision if exposed to conflicting messages about the innovation (Rogers, 2003).

For this study, therefore, Diffusion of Innovations provided a good theoretical anchor for investigating the relationships between SaaS Adoption Psychographic Profiles and SaaS Adoption. The five attributes of an innovation namely relative advantage, compatibility, complexity, trialability and observability also provided solid theoretical underpinnings for some of the SaaS Adoption Facilitators and Inhibitors hypotheses (claims) later developed in this chapter.

2.2.2. Technology, Organization and Environment (TOE) Framework

The TOE framework is an organization-level theory, developed by Tornatzky & Fleischer (1990), that explains that three different elements of a firm's context influence adoption decisions. These three elements are the technological context, the organizational context, and the environmental context. The technological context includes all of the technologies that are relevant to the firm, both technologies that are already in use at the firm as well as those that are available in the marketplace but not currently in use (Baker, 2011). The organizational context is related to the resources and the characteristics of the firm, e.g., size and managerial structure (Baker, 2011). The environmental context, refers to the arena in which a firm conducts its business; it can be related to surrounding elements such as industry, competitors and the presence of technology service providers (Baker, 2011). These three contexts present both constraints and opportunities for technological innovation adoption (Tornatzky & Fleischer, 1990). These three key constructs are discussed in detail following sections.

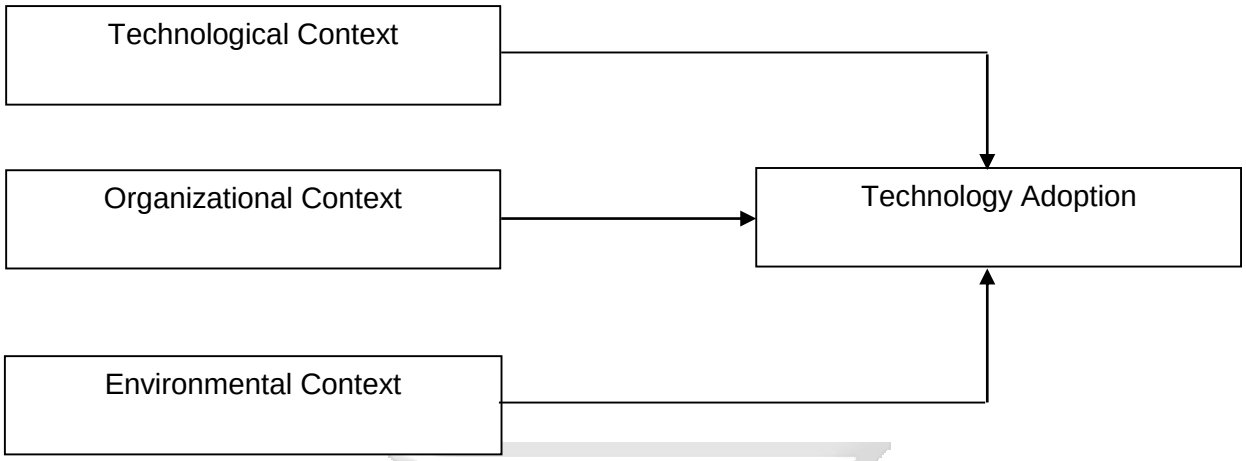

Figure 2.3 Technology Organization & Environment Framework

Source: Tornatzky & Fleischer (1990)

2.2.2.1. Technological Context

Technological aspect of the TOE framework refers to both availability and characteristics of the technologies. Any internal and external technology that is relevant to the firm is part of the technological aspect. According to Baker (2011), technologies that are currently in use by the firm, and technologies which are in the market but not in use by the firm, influence the adoption decision. Technologies that are currently in use by the firm influence the adoption decision, because they define the scope and limit of the technological change that the firm can accept. On the other hand, the technologies that are in the market but not in use by the firm influence the adoption decision, because they indicate how firms can evolve by adopting new technologies (Baker, 2011).

The technological arm of TOE is an extension of Rogers' Diffusion of Innovations Theory, the five attributes of an innovation are retained: Relative Advantage refers to "the degree to which an innovation is perceived as better than the idea it supersedes" (Rogers, 2003). Compatibility refers to "the degree to which an innovation is perceived to be consistent with existing values, past experiences, and needs of potential adopters" (Rogers, 2003). Complexity refers to "the degree to which an innovation is perceived as relatively difficult to understand and use" (Rogers, 2003). Trialability refers to: "the degree to which an innovation may be experimented with on a limited

basis", (Rogers, 2003). Observeability is the degree to which the results of an innovation are visible to others (Rogers, 2003).

According to Baker (2011), technologies that are outside the firm's boundaries create incremental, synthetic or discontinuous changes. Technologies that offer incremental changes only add new features to the existing technologies. This type of technologies has the lowest amounts of risks. Innovations, which produce synthetic changes, are those, which combine already existing technologies in a novel way. These innovations are moderately risky. Discontinuous changes are those, which are radically different than the existing technologies, and come with the highest amount of risk.

2.2.2.2. Organizational Context

The organizational context refers to the characteristics and resources of the firm, including linking structures between employees, intra-firm communication processes, firm size, top management support, innovativeness and the slack resources (Baker, 2011). Researchers believe that decentralized organizations are best suited for innovation stage; while centralized organizations are best suited for implementation stage of innovation process (Amini & Bakri, 2015). Size refers to the relative size of an organization as represented by resources including employees, assets, and intellectual property. Larger firms are considered better suited to adopt a new IS innovation due to the availability of slack resources and increased financial resources (Zhu et al., 2010). Top management support refers to "devoting time to ICT programme in proportion to its cost and potential, reviewing plans, following up on results". Top management, therefore, can promote or inhibit adoption of new innovations (Zhu et al., 2010). Innovativeness refers to "the extent to which an organization adopts an innovation earlier than other members of the same social context" (Rogers, 2003). Prior technology experience refers to "the extent of a user's experience with previous similar technologies" (Rogers, 2003).

2.2.2.3. Environmental Context

Environmental aspect of the TOE framework refers to competitive pressure, structure of industry, supplier support, and government's regulation (Baker, 2011). Competitive pressure refers to: "the degree of pressure felt by the firm from competitors within the industry" (Oliveira and Martins, 2010). The external influence of peer firms believed to be benefitting from cost reductions or experiencing other advantages due to cloud computing may influence a firm's decision to procure

cloud services (Oliveira et al., 2014). Industry refers to “the sector to which the organization belongs” (Oliveira et al., 2014). Supplier support refers to “supplier activities that can significantly influence the probability that an innovation will be adopted” (Zhu et al., 2004). Chang et al., (2020) posit that companies are likely to adopt SaaS because of the recommendation and requirement of their business partners, and that if their competitors are using SaaS, they will be forced to follow the crowd to remain competitive in the industry. Government regulation can either support or inhibit the adoption of innovation (Amini & Bakri 1990).

2.3. Empirical Review

2.3.1. SaaS Adoption Facilitators

In their research on drivers of SaaS adoption, Benlian et al., (2009) found that the drivers for adopting SaaS vary depending on the characteristics of the application that is considered for SaaS-outsourcing. They found that applications that can be characterized as less specific (i.e. high level of standardization), of less strategic relevance (i.e. supporting less critical parts of the company), and that are associated with a lower level of adoption uncertainty (i.e. companies bear lower technical and economic risks when outsourcing this application type) are to a higher degree adopted in a SaaS-based setting. For that reason, Office and Collaboration applications with lower levels of specificity, strategic significance, and adoption uncertainty had the highest adoption rates according to their study, and by contrast, ERP systems with higher levels of specificity, strategic significance, and adoption uncertainty ranked among the applications with the lowest SaaS-adoption rates in 2009 (Benlian et al., 2009).

Madisha (2012) found that the dominant facilitators and enablers of SaaS adoption are: good user awareness, sufficient resources to facilitate adoption, affordable and good Internet infrastructure, good or guaranteed security and privacy, functionality and resulting business efficiency. Kituku (2012) study on the adoption of cloud computing by NSE listed companies found that cloud computing is easier to use, easier to learn, solves problems and is safer; safer is a contradiction as the very study established that the major concerns for cloud computing were security, privacy and reliability. Lee et al., (2013) found that in the Korean SaaS market, customers were driving the adoption more than the suppliers; further, customers were adopting SaaS with the expectation and satisfaction for economic benefits. More specifically, factors, such as reduced costs and rapid deployment, were allowing customers to drive the adoption of SaaS. Chang (2020) using a multi-

theoretical framework established the enablers of SaaS ERP adoption as system quality, financial advantage and industry pressure; contrary to his hypothesis and expectation, government support had no effect on SaaS ERP adoption. Safari et al., (2015) using DOI and TOE established that relative advantage, competitive pressure, security & privacy, sharing & collaboration culture, social influence, compatibility, IT resource, observability and complexity were all influential factors in SaaS adoption.

2.3.1.1. Financial Advantage

Because the cost of SaaS applications is extended over a subscription period, the initial cost for obtaining the software is significantly lower than traditional upfront purchase costs associated with on-premise applications (Chang, 2020). Lechesa (2012) also found that cost advantage was one of the benefits of SaaS adoption owing to low TCO and pay-as-you-go model. Majengo and Mbise (2022) found that cost reduction is the most significant determinant for adoption of SaaS by SMEs in Tanzania underpinned by the fact that SaaS model offers a relatively low-cost solution as it shifts the development, maintenance, and infrastructure costs from users to the SaaS vendor. Financial Advantage is anchored on the Relative Advantage attribute in DOI (and Technology construct in TOE). The following hypothesis is derived:

H_1: Financial Advantage is positively associated with SaaS Adoption.

2.3.1.2. Solution Scalability

Unlike traditional on-premise software applications that are typically purchased upfront, many SaaS offerings are subscription-based and are usually priced on a per-user basis. This per-user model allows organizations to scale up or scale down usage based on their demand, thus eliminating idle capacity in terms of licensing (Lee et al., 2015). Solution Scalability is anchored on the Relative Advantage attribute in DOI (and Technology construct in TOE). The following hypothesis is derived:

H_2: Solution Scalability is positively associated with SaaS Adoption.

2.3.1.3. Top Management Support

Even if external factors such as institutional pressures are strongly present, it is the top management team that ultimately makes the decision to adopt SaaS or not (Elbashir et al., 2011). Therefore, top management's belief about the benefit of SaaS drives certain managerial actions that may increase the level of SaaS adoption in an organization. Oliveira et al. (2014), in their study of cloud computing adoption by firms in the manufacturing industry, established that top management support is critical in the cloud adoption journey, and is normally in the form of committing financial and organizational resources as well as engaging in the adoption journey. Top Management Support is anchored on the Organization construct in TOE. The following hypothesis is derived:

H_3: Top Management Support is positively associated with SaaS Adoption.

2.3.1.4. Rapid Deployment

With SaaS offerings, customers do not need to install any systems or software packages on-premise; they only need Internet access and APIs for integration (Lee et al., 2015). This enables shorter time-to-value compared to the long implementation lead times associated with on-premise deployments. Wu and Lan (2011) also affirmed the fast and easy deployment of SaaS as a key facilitator of SaaS adoption. Rapid Deployment is anchored on the Relative Advantage attribute in DOI (and Technology construct in TOE). The following hypothesis is derived:

H_4: Rapid Deployment is positively associated with SaaS Adoption.

2.3.1.5. Industry Pressure

The activities of industry competitors and SaaS technology vendors can pile pressure on a customer to adopt SaaS (Chang, 2020; Safari et al., 2015). Most SaaS vendors have aggressive market activities which may influence their prospects (and existing customers) to adopt SaaS. When companies face constant pressure from their competitors or SaaS vendors, and become increasingly aware of SaaS benefits, they are more likely to adopt SaaS (Lumsden and Gutierrez, 2013). Industry Pressure is anchored on the Environment construct in TOE. The following hypothesis is derived:

H_5: Industry Pressure is positively associated with SaaS Adoption.

2.3.2. SaaS Adoption Inhibitors

There have been a number of studies on the inhibitors of SaaS adoption. The dominant barriers of SaaS adoption according to Madisha (2012) are limited customization, long-term sticker shock (or vendor lock-in), integration problems, lack of open standards, perceived security concerns, and barriers to entry in developing countries characterized by poor telecommunications infrastructure, expensive and unreliable broadband owing to limited competition. While poor Internet could have been an inhibitor in 2012, there has been a proliferation of pervasive high-capacity broadband, though cost of good reliable connectivity is still a concern for many (CA, 2020). Lee et al., (2013) found that in the Korean SaaS market, the anxiety felt by customers relating to information leakage (security) was the most inhibiting factor, and that other factors like lack of awareness, lack of SaaS experts and legal issues, played insignificant inhibiting roles. In earlier studies in Korea, lack of awareness had been the highest inhibitor, Lee at al., (2013), therefore, concluded that SaaS providers in Korea had raised their awareness and sensitization campaigns on software as a service versus software as license delivery models, and the benefits of SaaS adoption. Lechesa et al., (2015) in their study of SaaS ERP adoption in South Africa established that security concerns, network limitations and limited customizations were the principal inhibitors of SaaS adoption.

2.3.2.1. Connectivity Constraints

Less pervasive availability of high-capacity broadband, and where it is available, uptime is a still a concern (Madisha, 2012; Lechesa et al., 2015) does affect the uptake SaaS and other cloud offerings. Consumption of SaaS offerings is typically via the Internet, unavailability and unreliability of broadband therefore negatively affect SaaS adoption. Connectivity Constraints is anchored on the Complexity attribute in DOI (and Technology construct in TOE). The following hypothesis is derived:

H_6: Connectivity Constraints is negatively associated with SaaS Adoption.

2.3.2.2. Limited Customization

Most SaaS applications are standard and are rigid when it comes to customizations (Lechesa et al., 2015). Although SaaS achieves rapid deployments through standard implementation templates, it does so at the expense of customization; more so, organizations run different processes and there can never be a single template that fits all. Limited Customization is anchored on the Complexity attribute in DOI (and Technology construct in TOE). The following hypothesis is derived:

H_7: Limited Customization is negatively associated with SaaS Adoption.

2.3.2.3. Security Concerns

Prospective customers often question SaaS vendors' ability to keep their data safe (Lee et al., 2013; Safari et al., 2015; Lechesa et al., 2015; Chang et al., 2020). Ceding the management and control of data to prospective SaaS vendors worries many organizations, as such, some organizations delay SaaS transitions due to security concerns. Security Concerns is anchored on the Complexity attribute in DOI (and Technology construct in TOE). The following hypothesis is derived:

H_8: Security Concerns is negatively associated with SaaS Adoption.

2.3.2.4. Integration Challenges

Integration costs can be quite high where legacy on-premise applications are to co-exist with SaaS applications, and they do not support modern simplified API integrations (Lechesa et al., 2015). Lack of interoperability among SaaS application providers has also been highlighted as an inhibitor to SaaS adoption by organizations. Integration Challenges is anchored on the Complexity attribute in DOI (and Technology construct in TOE). The following hypothesis is derived:

H_9: Integration Challenges is negatively associated with SaaS Adoption.

2.3.2.5. Vendor Lock-In

This refers to a situation where the cost of switching to a different vendor is so high that the customer is essentially stuck with the original vendor whose services might of inferior quality

(Opara-Martins et al., 2016). They further opine that because customers are unable to switch to another vendor owing to the lock-in, customers become quite vulnerable to any changes made by the SaaS vendor. Vendor Lock-In is anchored on the Environment construct in TOE. The following hypothesis is derived:

H_{10}: Vendor Lock-In is negatively associated with SaaS Adoption.

2.3.3. SaaS Adoption Psychographic Profiles

Benlian et al. (2009) found that subjective norm has a very strong and highly significant impact on the attitude toward SaaS adoption. In their study they found that the opinion of trusted third parties on SaaS plays a major role in forming the attitude of companies considering the adoption of SaaS. Perhaps owing to different psychographic profiles, they found that companies appear not to blindly follow the recommendations of other organizations by unreflectively imitating their adoption behavior. Instead, the opinions of third parties seem to inform in the IT user companies' process of building their own attitude about SaaS based on criteria such as costs, benefits, and investments. This finding is consistent with Rogers' Diffusion of Innovations theory and the adoptive behaviour of the various psychographic profiles of a population.

De Wet (2018) found that on the basis of Roger's Diffusion of Innovations (DOI) theory, if any of the SME participants would want to adopt a SaaS application, they would fall in the "late majority" adoption category. With 53% of the business applications used in the research study were of a SaaS type, it can be said that the peak of the innovativeness curve had been reached for SMEs partaking in the study. Overall, the study found that SaaS-based ERP performed better than conventional ERP by achieving a 32% higher ranking in functionality and a 27% higher ranking in provider support. What is unclear in the De Wet (2018) study is whether the adoptive behaviour was consistent throughout the different SaaS ERP adoption psychographic profiles as the researcher did not explicitly establish the five different adopter categories within the population. One limitation of the De Wet (2018) study was the fact that all the SaaS-based ERP tenants were located in or close to main cities, he therefore, recommended research that would focus on SMEs operating in remote towns with poor technological infrastructure in terms of last mile connectivity, limited broadband technology and connection latency challenges.

Rogers (2003) posits that the salient value of Innovators is venturesomeness, due to a desire for the rash, the daring, and the risky, and that Innovators must also be willing to accept an occasional

setback when a new idea proves unsuccessful, as inevitably happens. According to Rogers (2003), Early Adopters decrease uncertainty about a new idea by adopting it, they serve as role models for many other members of the social system and they help trigger the critical mass when they adopt an innovation. According to Rogers (2003), the Early Majority's innovation-decision period is relatively longer than that of the innovators and the early adopters. A quote by Pope (1711) aptly describes Early Majority: Be not the first by whom the new is tried, nor the last to lay the old aside. Rogers (2003) posits that Late Majority approach innovations with a skeptical and cautious air, and that they do not adopt until most others in their system have already done so, and that the pressure of peers is necessary to motivate adoption. Moore (2004) posits that one of the favorite arguments of Laggards is that disruptive innovations of any kind rarely fulfill their promises and almost always come with unintended consequences. According to Rogers (2003), Laggards tend to be suspicious of innovations and of change agents, their innovation-decision process is relatively lengthy, with adoption and use lagging far behind awareness-knowledge of a new idea. Based on the foregoing, the following hypothesis is derived:

H_{11}: Psychographic Profiles is positively associated with SaaS Adoption.

2.4. Summary of Research Gaps

Of the studies reviewed, there was disproportionate research work done on Cloud Computing and SaaS adoption by SMEs (Njaaga, 2019; Mwaniki & Ondiek, 2018; Tiren, 2017; Ondiek, 2016; Oduor, 2016; Bitta, 2012; Madisha, 2012; Lee et al., 2013, just to mention a few). Locally, only Kituku (2012) undertook a cloud computing adoption study by the NSE listed companies. This study, therefore, sought to bridge the paucity of research done on cloud computing, specifically SaaS adoption, by NSE listed companies. Kituku (2012) study on cloud adoption by NSE listed companies focused on ICT managers' attitudes towards cloud computing, functions which had been moved to the cloud and challenges faced by them during migration to the Cloud. He recommended further research on inhibitors of cloud computing adoption, precisely one of the objectives that this study sought to investigate. Additionally, from the studies reviewed, none established the psychographic profiles of their populations and the relationship with adoption. This study using Hurt et al. (1977) modified Scales for Measurement of Innovativeness sought to establish the psychographic profiles of NSE listed companies as well as the relationship with SaaS adoption.

Table 2.1 Summary of Research Gaps

Author	Title	Findings	Research Gap
Lee et al. (2013)	Drivers and Inhibitors of SaaS Adoption in Korea.	The study employed Herzberg's two-factor theory in order to classify the SaaS market into adoption-driving and adoption-inhibiting areas and PEST further classification and analysis. The study found that customer factors in the consumerization phenomenon and economic factors in the PEST analysis were the most important drivers of SaaS adoption. From the adoption-inhibiting area, customer factors as well as supplier and environment factors inhibited SaaS adoption.	This study sought to establish the SaaS adoption psychographic profiles of NSE listed companies besides investigating some of the facilitators and inhibitors. This study used DOI and TOE.
Kituku (2012)	Adoption of Cloud Computing in Kenya by companies listed in the Nairobi Stock Exchange.	The study found that most managers perceived cloud computing to be easy to use, solves problems, safer and easy to learn. It recommended that successful case studies of cloud computing be documented to facilitate	This study sought to investigate some of the facilitators and inhibitors of SaaS adoption as well as establish the psychographic profiles of the NSE listed companies. The study used a

		adoption among commercial companies. The study used TAM-DTM to establish and analyze the individual attitudes and perceptions of managers towards cloud computing.	muti-theoritical approach of DOI and TOE which are firm-level theories.
Madisha (2012)	Factors influencing SaaS Adoption by Small South African Organizations.	The study focused on small to medium organizations and used Perceived E-Readiness Model (PERM) to study SaaS readiness and adoption. The study found that awareness, resources and market forces were significantly correlated to SaaS adoption. On the other hand, high Internet costs, low Internet reliability and poor access to Internet were the main inhibitors of SaaS Adoption.	The study sought to establish the psychographic profiles of the NSE listed companies besides investigating the SaaS adoption facilitators and inhibitors.
Njaaga (2019)	Factors influencing software as a service enterprise resource planning system implementation - case: Small	The study using TOE framework found that the technological factors, organizational factors, environmental factors and SaaS ERP were positively and	In addition to investigating SaaS adoption facilitators and inhibitors, this study sought to establish the SaaS adoption

	and Medium Enterprises in manufacturing industry in Nairobi County.	significantly correlated. The study established that, financial constraints and lack of knowledge, were key inhibitors to SaaS ERP successful implementations.	psychographic profiles of NSE listed companies.

Source: Researcher (2022)

2.5. Conceptual Framework

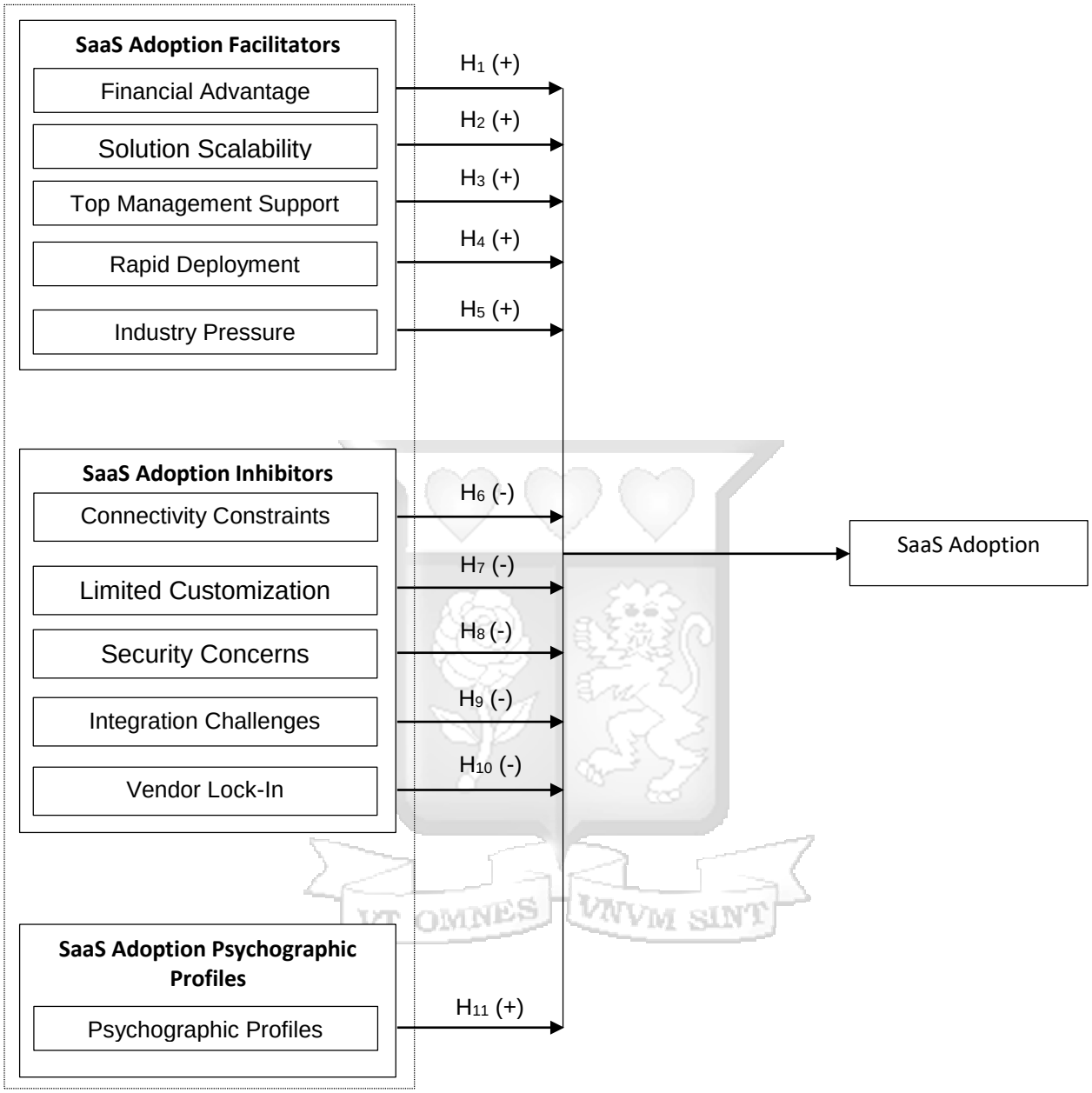

Figure 2.4 Conceptual Framework

Source: Researcher (2022)

Table 2.2 Operationalization of Variables

Independent Variables:	Indicator	Source
Financial Advantage (FA)	• Shift financial model from capital expenditure to operating expenditure. • Reduced TCO (Total Cost of Ownership).	Chang (2020) Oliveira et al. (2014)
Solution Scalability (SS)	• Ability to scale up or scale down usage depending on internal demand. • Enable mobile workforce productivity – work from any device, any location, any time.	Lee et al. (2013)
Top Management Support (TMS)	• Make go/no-go decision on SaaS adoption. • Delineating "core" from "context" applications, "context" applications are good candidates for SaaS.	Low et al. (2011) Oliveira et al. (2014)
Rapid Deployment (RD)	• Shorter time-to-value arising from standard configurable templates. • Browser based access hence customers do not need to install any systems or software packages on-premise.	Lee et al. (2015)
Industry Pressure (IP)	• The activities of industry competitors, and • The activities of SaaS technology vendors, can pile pressure on a customer to adopt SaaS.	Chang (2020), Safari et al. (2015) Oliveira et al. (2014), Lumsden and Gutierrez (2013)

Independent Variables:	Indicator	Source
Connectivity Constraints (CC)	• Less pervasive availability of high-capacity broadband and high cost of broadband. • Reliability and uptime of high-capacity broadband.	Madisha (2012), Lechesa et al. (2015)
Limited Customization (LC)	• Standard and rigid configuration templates associated with SaaS applications. • Process maturity assumption across all customer types, which is never quite the case.	Lechesa et al. (2015)
Security Concerns (SC)	• Customers question their supplier's ability to keep their data safe. • Mobile workforce productivity introduces additional security challenges which must be mitigated at extra cost.	Lee et al. (2013), Safari et al. (2015), Lechesa et al. (2015) Chang et al. (2020) Oliveira et al. (2014)
Integration Challenges (IC)	• Integration costs can be quite high where legacy on-premise applications are to co-exist with SaaS applications in a hybrid architecture. • Lack open standards among SaaS vendors limit interoperability and inhibit seamless integration.	Lechesa et al. (2015)
Vendor Lock-In (VLI)	• Most SaaS contracts are three to five years, there is fear of being locked-in for the duration even if the service does not measure up.	Opara-Martins et al., (2016)

	• Cost of migration can be prohibitive forcing a customer to stick with a SaaS vendor offering inferior service.	
Independent Variable:	**Indicator**	**Source**
Psychographic Profiles (PP)	• **Innovators** are venturesome, they have a desire for the rash, the daring, and the risky. • **Early Adopters** have the highest degree of opinion leadership. Potential adopters look to Early Adopters for advice and information about an innovation. • "Be not the first by which the new is tried, nor the last to lay the old aside" perfectly fits the thinking of the **Early Majority**. • **Late Majority** do not adopt until most others in their system have already done so. The pressure of peers is necessary to motivate adoption. • **Laggards'** innovation-decision process is relatively lengthy, with adoption and use lagging far behind awareness-knowledge of a new idea.	Rogers (2003)
Dependent Variable:	**Indicator**	**Source**
SaaS Adoption (SA)	• Various SaaS applications in use by the respondent NSE listed company and ERP workloads already migrated to the Cloud.	Benlian et al. (2009) Kituku (2012)

	• Approximate percentage of overall applications budget allocated to SaaS-based outsourcing.	

Source: Researcher (2022)

CHAPTER 3: RESEARCH METHODOLOGY

3.1. Introduction

This chapter outlines research methodology and approach that was used to complete the research. The chapter discusses: research philosophy, research design, population of the study, sample design and technique - census survey versus sampling and reasons for choosing census survey, data collection methods and procedures, data quality – reliability and validity test, data analysis and ethical considerations.

3.2. Research Philosophy

Research philosophy as an overarching term relates to the development of knowledge and the nature of that knowledge (Saunders et al., 2012). The research philosophy adopted for this study is positivism. In a positivist research philosophy, research is undertaken in a value-free way, the researcher is independent of the data and maintains an objective view (Saunders et al., 2012).

3.3. Research Design

The research employed descriptive research approach which includes surveys and fact-finding enquiries. According to Kothari (2012), the major purpose of descriptive research is description of the state of affairs as it exists at present. The researcher has no control over the variables; he can only report what has happened or what is happening. Owing to the positivist research philosophy adopted for this study, quantitative research design was used to investigate relationships between the dependent variable and the independent variables, measured numerically, and analyzed using both descriptive and inferential statistics (Saunders, 2012). The research was largely a firm-level study seeking to establish NSE listed companies' level of adoption of software-as-a-service, SaaS adoption facilitators, SaaS adoption inhibitors, and SaaS adoption psychographic profiles of the population, as independent variables and their relationships with SaaS adoption as the dependent variable.

3.4. Population of the Study

Nairobi Securities Exchange currently has 63 listed companies in the following categories: agricultural, automobiles and accessories, banking, commercial and services, construction and allied, energy and petroleum, insurance, investment, investment services, manufacturing and allied, telecommunication and technology, growth enterprise market segment. Census inquiry, which involves complete enumeration of all items in the population, was used owing to the fairly small population size. Kothari (2012), avers that when all items are covered, no element of chance is left and highest accuracy is obtained. Targeted key informants included Chief Information Officers, IT Managers, and Business Systems Managers of the Nairobi Securities Exchange listed companies, one key informant per NSE listed company.

3.5. Sample Design and Technique

Because of the small size of the overall population and the disproportionate population spread in the sub-categories, a census survey was employed to enumerate all the companies listed at the Nairobi Securities Exchange. A sample on the other hand would have entailed working with a portion of the population to estimate the characteristics of the entire population. Census survey has the following advantages: provides a true measure of the population (no sampling error), benchmark data may be obtained for future studies, and detailed information about small sub-groups within the population is more likely to be available. Its disadvantages include: may be difficult to enumerate all units of the population within the available time, higher costs - both in staff and monetary terms, than for a sample, generally takes longer to collect, process, and release data than from a sample.

Sampling has its advantages which include: costs would generally be lower than for a census, results may be available in less time, if good sampling techniques are used, the results can be very representative of the actual population. Its disadvantages include: data may not be representative of the total population, particularly where the sample size is small, often not suitable for producing benchmark data, as data are collected from a subset of units and inferences made about the whole population, the data are subject to 'sampling' error, decreased number of units will reduce the detailed information available about sub-groups within a population. A census survey approach was preferred for the research as opposed to sampling to cover the entire population of companies listed in the Nairobi Securities Exchange and to obtain the highest accuracy possible.

3.6. Data Collection Methods

This study used primary data. The data was obtained from the original sources using Internet mediated questionnaire via SurveyMonkey. The use of questionnaire was justified because it provided a cheap, effective and efficient way of gathering information within a very short period of time. The questions were designed to be both closed and open ended.

3.7. Data Collection Procedures

Primarily the researcher sent questionnaires to CIOs, IT Managers and Application Managers. The research targeted one respondent per NSE listed company. Semi-structured, self-administered questionnaire was used; that is, with open and close-ended questions for qualitative and quantitative data respectively. Questionnaire as a research instrument for data collection was considered as it is less costly, uses less time, requires less administration effort inherent in instruments like interviews and useful in obtaining objective data. Furthermore, a questionnaire has standardized answers that make it simple to compile data collected. Likert scale was used in analyzing adoption determinants – facilitators, inhibitors and psychographic profiles as the independent variables and SaaS Adoption as the dependent variable. According to the objectives of this research: Section A dealt with respondent demographics and details about the NSE listed company, Section B dealt with objective 1. – Software-as-a-Service adoption facilitators, Section C dealt with objective 2 – Software-as-a-Service adoption inhibitors, Section D dealt with objective 3 – Softwares-as-a-Service adoption psychographic profiles of the respondent companies, Section E dealt with the dependent variable, SaaS adoption, and sought to collect data on which SaaS applications were the NSE listed companies already using or planned to use, as well as, the percentage of applications budget they allocated to SaaS-based outsourcing.

3.8. Research Quality

Saunders et al., (2012) state that internal validity and reliability of the data one collects and the response rate one achieves depends to a large extent on the design of the questions, the structure of the questionnaire and the rigor of one's pilot testing. Their definitions of validity and reliability with respect to a questionnaire as a study instrument are that a valid questionnaire will enable accurate data that actually measure the concepts one is interested in collecting; whilst a questionnaire is reliable means that data are collected consistently. Pilot study was conducted to

establish reliability and validity of the questionnaire. In this study, questionnaire was tested on 10% of the population which is equivalent to 6 respondents and this was done to guarantee its relevance and effectiveness. The subjects who participated in the pilot study were not included in the final study to avoid survey fatigue.

3.8.1. Reliability

Cronbach alpha was adopted to confirm the reliability of the study. This is because the Cronbach's Alpha enables the researcher to know if the instruments of research would avail reliable and consistent answers even when questions are replaced with similar ones. A variable is said to be stable if it produces a stable response from similar questions set. Cronbach's Alpha shows reliability by indicating a true score of the 'underlying' construct (Gliem & Gliem, 2003). The 'Alpha' value (true score) has values that range from 0 to 1. A high score is used to indicate high reliability, 0.7 being the accepted and adequate value of Alpha or reliability coefficient (Gliem & Gliem, 2003). A pilot was run by having six respondents fill out the Internet-mediated questionnaire on SurveyMonkey, to provide feedback on any unclear questions as well as to gauge the average time it took them to complete the questionnaire. These six were not included in the final response rate achieved of 50 out of 63. The Cronbach Alpha coefficients for all the variables are tabulated in the table below, they all surpassed the 0.7 cut-off and were all acceptable.

Table 3.1 Cronbach Alpha Tests Results

Variable	Cronbach Alpha	Comment
Financial Advantage (FA)	0.9020	Acceptable
Solution Scalability (SS)	0.8889	Acceptable
Top Management Support (TMS)	0.7500	Acceptable
Rapid Deployment (RD)	0.9615	Acceptable
Industry Pressure (IP)	0.7143	Acceptable
Connectivity Constraints (CC)	0.8348	Acceptable
Limited Customization (LC)	0.9647	Acceptable
Security Concerns (SC)	0.9030	Acceptable
Integration Challenges (IC)	0.8108	Acceptable
Vendor Lock-In (VLI)	0.9362	Acceptable
Psychographic Profiles (PP)	0.9282	Acceptable
Software as a Service Adoption (SA)	0.8816	Acceptable

3.8.2. Validity

Internal validity in relation to questionnaires refers to the ability of the questionnaire to measure what one intended it to measure (Saunders et al., 2012). Content validity refers to the extent to which measurement device provides adequate coverage of the investigative questions (Saunders et al., 2012). Construct validity refers to the extent to which measurement questions actually measure the presence of the constructs one intended them to measure (Saunders et al., 2012). To give assurance on internal, content and construct validity of the study, the survey questionnaire instrument was reviewed in detail by three ICT professionals who themselves have undertaken research on Cloud Computing. After their review and feedback, some questions were re-worded, others removed and new ones added.

3.9. Data Analysis

The filled-in questionnaires were keenly reviewed for consistency and the incorrectly or inadequately filled ones were corrected. The questionnaire responses were coded on a scale of 1 (Strongly Disagree) to 5 (Strongly Agree). The questions on the SaaS Adoption Inhibitors were then reverse-coded before carrying out the correlation tests. Descriptive and inferential statistical analysis techniques were used; consistent with the research design. Using Excel for Mac version 16.54 all descriptive statistics were obtained, while Stata version 17 was used to carry out Spearman's rank correlation coefficient (Spearman's rho) tests, the coefficients obtained were used to uphold or not uphold the hypotheses (claims).

3.9.1. Hypothesis Testing

Spearman's rank correlation coefficient (Spearman's rho) was preferred to test the strength of relationships between the dependent variable and the independent variables. The coefficients of the independent variables were analysed to test the eleven hypotheses formulated for the SaaS adoption facilitators, inhibitors and psychographic profiles. Positively supported measures were those with significantly positive coefficients (met the 0.35 cut-off criteria), meaning they were positively associated with SaaS adoption. Negatively supported measures were those with significantly negative coefficients (met the -0.35 cut-off criteria), meaning they were negatively associated with SaaS adoption. Unsupported hypotheses were those variables with coefficients that were not statistically significant or that did not meet the cut-off criteria of 0.35 and -0.35.

3.9.2. Psychographic Profiles

These were established by having the respondents answer a set of twenty questions adopted and modified from scales for the measurement of innovativeness survey instrument developed by Hurt et al., (1977). In the survey instrument administered to the respondents, these questions were 29 to 48 as set out in Appendix IV Section D. The Likert scale data obtained, for each respondent, were coded using 1 for Strongly Disagree, 2 for Disagree, 3 for Neutral, 4 for Agree and 5 for Strongly Agree, then scored using the following steps:

Step 1: Add the scores for items 32, 34, 35, 38, 41, 43, 45, and 48.
Step 2: Add the scores for items 29, 30, 31, 33, 36, 37, 39, 40, 42, 44, 46, and 47.
Step 3: Complete the following formula: II = 42 + total score for Step 2 - total score for Step 1.

Once the individual scores of the respondent organizations were obtained, they were interpreted as follows:

Scores above 80 are classified as Innovators.
Scores between 69 and 80 are classified as Early Adopters.
Scores between 57 and 68 are classified as Early Majority.
Scores between 46 and 56 are classified as Late Majority.
Scores below 46 are classified as Laggards/Traditionalists.

3.10. Ethical Considerations

Saunders et al., (2012) have articulated the following ethical principles which underpinned this research: integrity and objectivity of the researcher, respect for others, avoidance of harm, privacy of those taking part, voluntary nature of participation and right to withdraw, informed consent of those taking part, ensuring confidentiality of data and maintenance of anonymity of those taking part, responsibility in the analysis of data and reporting of findings, compliance in the management of data and ensuring the safety of the researcher. At all times during the study, I used my Strathmore University email address and SurveyMonkey while administering the Internet-mediated questionnaire as opposed to my personal email address. This professionalized the study and minimized objections that would have otherwise cropped up. Before administering the Internet-mediated questionnaire, a letter of authorization was obtained from the postgraduate

department at Strathmore University as well as a permit to conduct the study was sourced from National Commission for Science, Technology and Innovation (NACOSTI).

CHAPTER 4: PRESENTATION OF RESULTS AND FINDINGS

4.1. Introduction

This chapter presents the research findings and is organized into three main sections. The first section presents the study response rate, demographic statistics of the respondents and respondent organizations. The second section presents descriptive statistics of the data collected and correlational tests that were carried out to test the relationships between SaaS Adoption Facilitators, SaaS Adoption Inhibitors, SaaS Adoption Psychographic Profiles and SaaS Adoption. The chapter concludes by summarizing the main research findings.

4.2. Response Rate

The study was a census survey, complete enumeration, of all the 63 listed companies at the Nairobi Securities Exchange, however, only 50 responses were received out of the 63 Internet-mediated questionnaires administered, representing 79.4% response rate. According to Cooper & Schindler (2011), survey response rates above 50% are acceptable for research analysis and publishing, 60% is good, 70% is very good while 80% and above is excellent. The 79.4% response rate achieved is near excellent and is therefore acceptable.

Table 4.1 Response Rate

Response	Frequency	Percentage
Responded	50	79.4%
Not responded	13	20.6%
Total	63	100%

4.3. Research Findings - Demographic Statistics

4.3.1. Gender

Majority of the respondents were male at 90%, while female respondents were only 10%, which is consistent with previous gender demographic findings (Kituku, 2012; Tiren, 2017; Ondiek, 2016; Oduor, 2016; Bitta, 2012) that majority of ICT professionals are male.

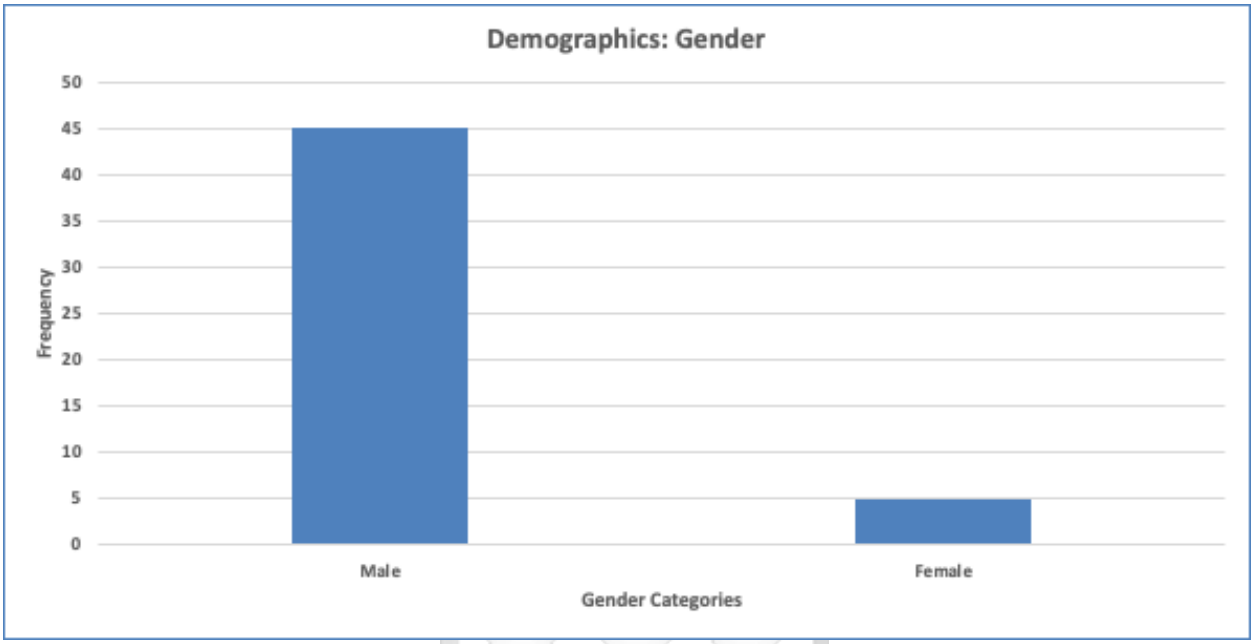

Figure 4.1 Demographics: Gender

4.3.2. Job Title

The modal value of the respondent job titles was Information Technology Manager at 44%, both Business Systems Manager and Chief Information Officer were at 12%, while Other was at 32%, implying that the responsibility of SaaS adoption is dispersed to other job titles within IT functions beyond the three traditional IT roles. The other respondent job titles that came up were: Infosec Officer, Business Analyst, Systems Administrator, Manager Data & Analytics, DevOps Team Lead, Robotics Process Automation Engineer, Software Engineering Manager, ERP Software Support & Implementation Consultant and ICT Support. One other reason for the diverse job titles is the fact that different IT workloads are being outsourced to SaaS vendors at different times depending on their strategic significance to the organization.

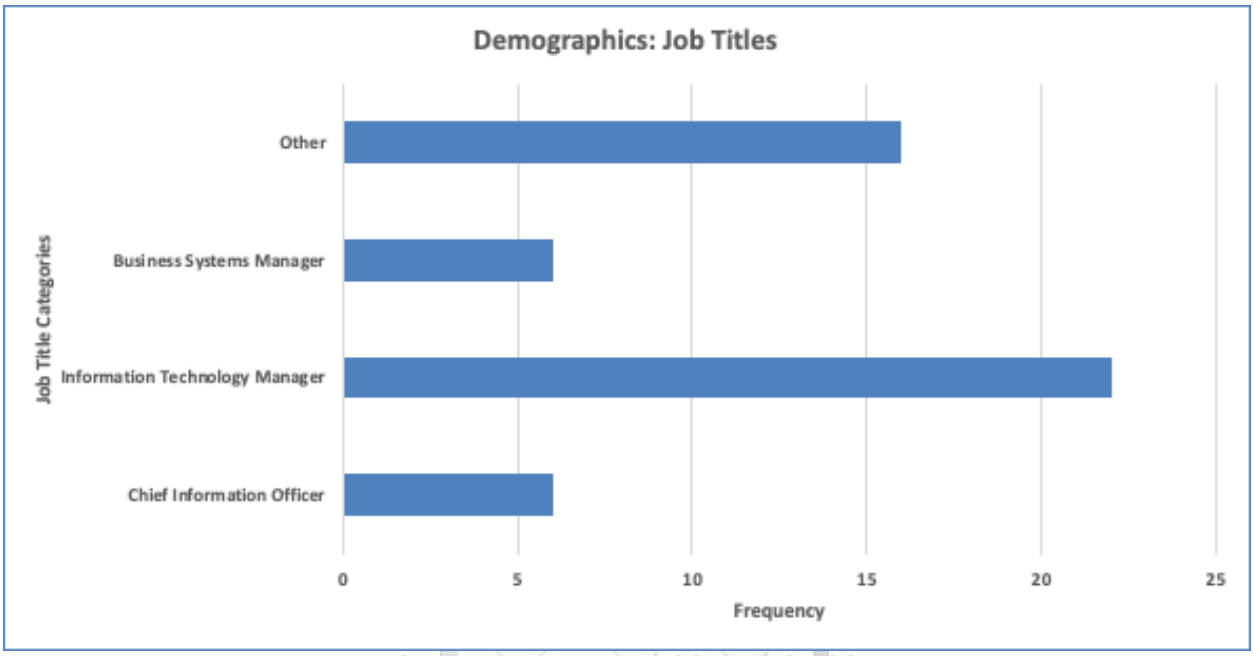

Figure 4.2 Demographics: Job Title

4.3.3. Level of Education

Majority of the respondents had their highest level of education of Master's Degree at 50%, while those with Bachelor's Degree stood at 46%, those with Diploma and Doctorate were at 2% each. This signifies the fact that most ICT jobs attract those with at least Bachelor's Degree who can cope and manage the complexities that IT presents. Those with Doctorate Degrees were equally few, same number as those with Diploma, implying that majority of Doctorate Degree holders could be in higher institutions of learning and research as opposed to corporates.

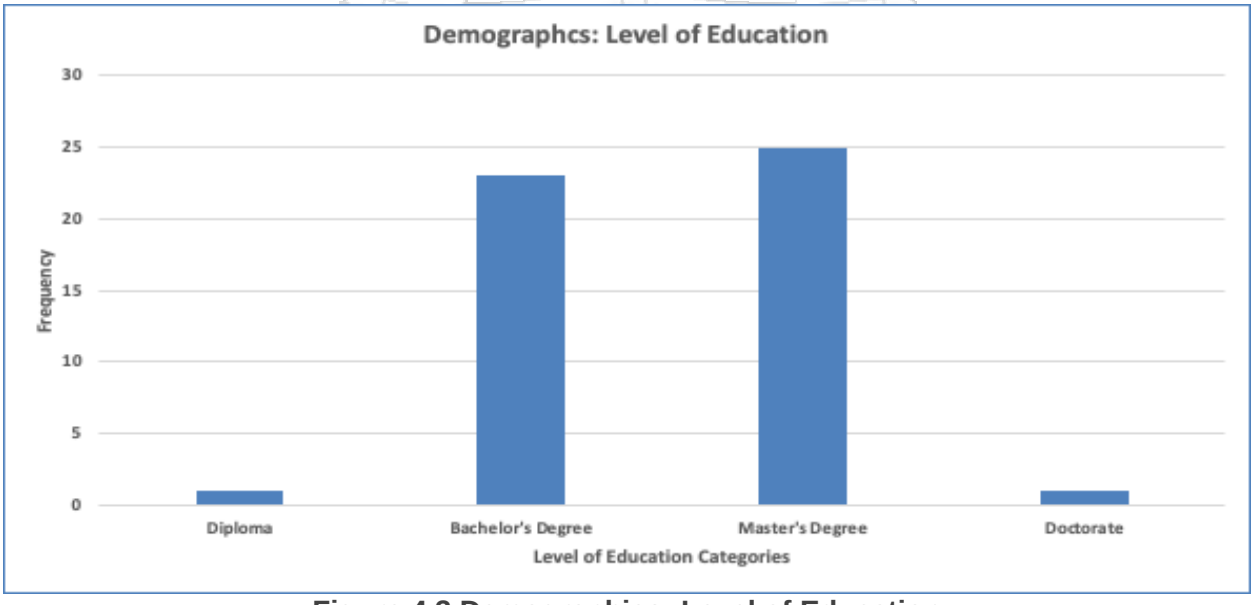

Figure 4.3 Demographics: Level of Education

4.3.4. Length of Service

Majority of the respondents, 82%, stated that they had been in the IT industry for 10 years or more, those who had been in the IT industry for 7 – 9 years stood at 4%, those who had been in the IT industry for 4 – 6 years stood at 8%, while those who had served for 3 years or less stood at 6%. Majority had therefore been active ICT professionals from the onset of Cloud and Software as a Service phenomenon, and were well acquainted with it, its benefits and some of the risks it presented to their organizations.

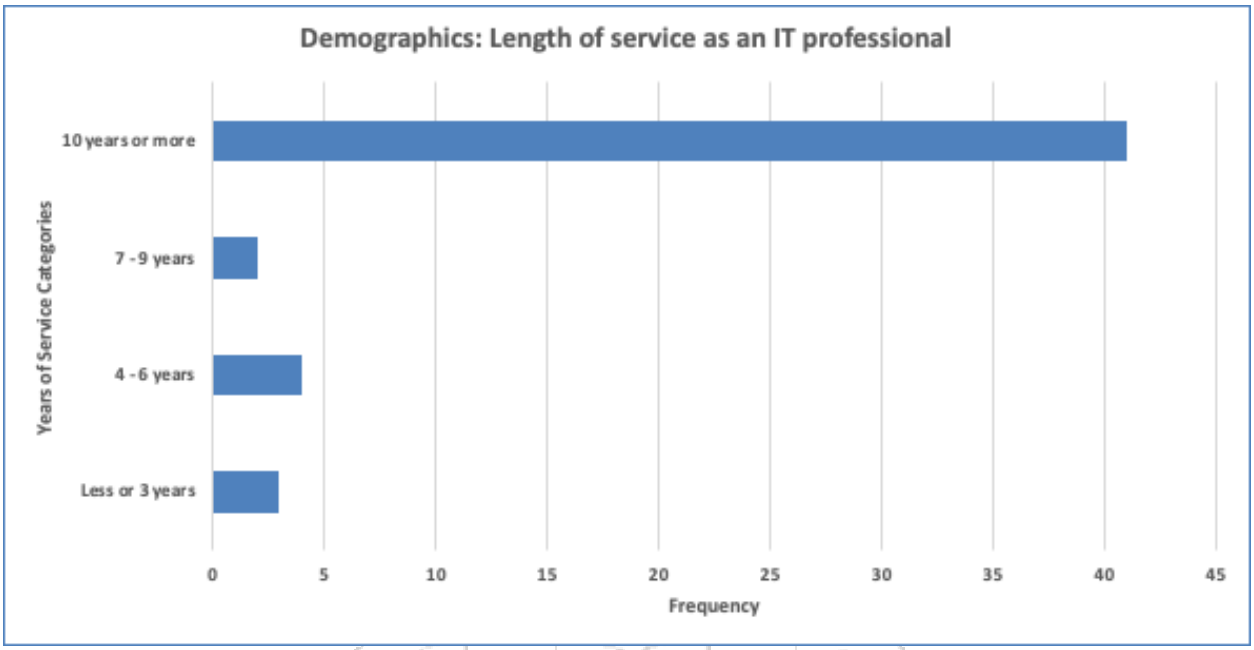

Figure 4.4 Demographics: Length of service as an IT professional

4.3.5. Industry Segments

All the 12 segments of the Nairobi Securities Exchange were represented in the responses received, with 100% response rate recorded for Automobiles & Accessories, Banking, Construction & Allied, Energy & Petroleum, Insurance, Investment Services, Telecommunication and Real Estate Investment Trust. Agricultural segment had a response rate of 83% while Commercial & Services had a response rate of 46%, contributing to this low response rate could have been the fact some of the companies in this segment had since been suspended from trading at the Nairobi Securities Exchange and their going-concern status was in doubt. The Investment segment had a response rate of 40%, while the Manufacturing & Allied had a response rate of 88%.

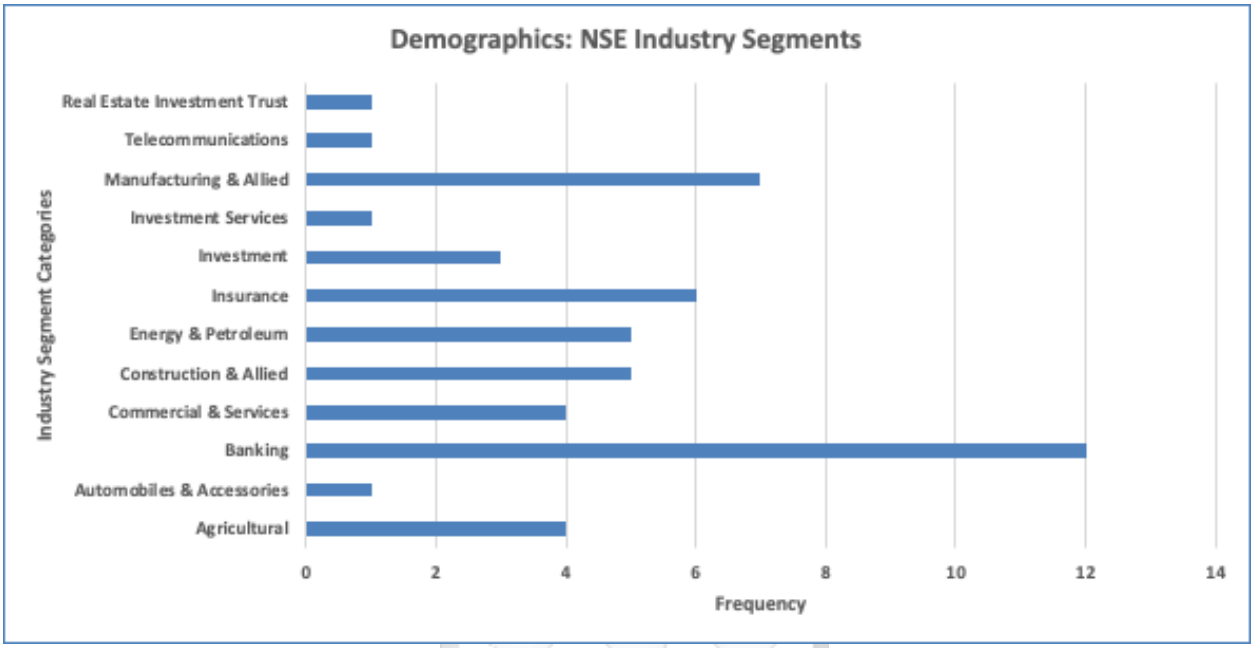

Figure 4.5 Demographics: Industry Segments

4.3.6. Number of Employees

The modal value was 4001 or more number of employees, implying that most of the Nairobi Securities Exchange listed companies employ in thousands owing to their size and geographical expansion. Some have geographical presence in the entire East Africa region owing to organic growth and/or acquisition of previous competitors.

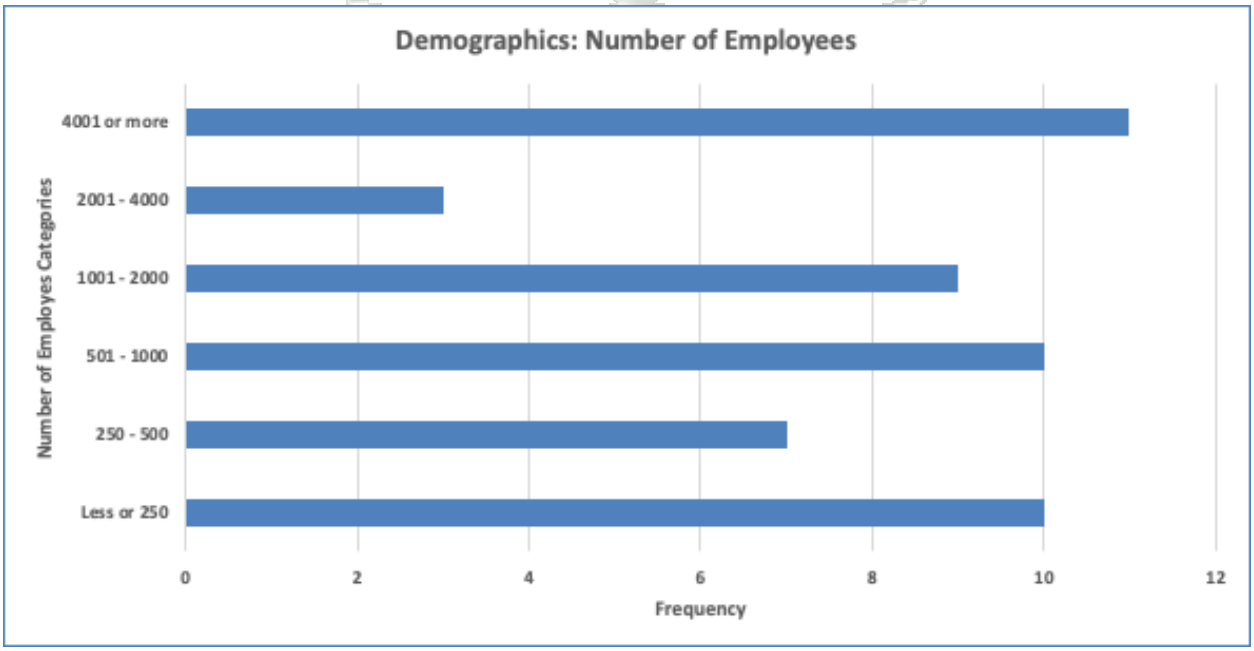

Figure 4.6 Demographics: Number of Employees

4.3.7. Annual Revenue

Majority of the Nairobi Securities Exchange listed companies make over Kshs 1 billion annually, the modal value being Kshs 1 – 10 billion in annual revenue, those making over Kshs 1 billion constitute 82% of the population. The pressure and incentive for high turnover could be to fund their large operations, capital expenditure requirements and pay dividends to their shareholders. A consistent revenue and profitability growth is an attractive attribute to existing and prospective shareholders.

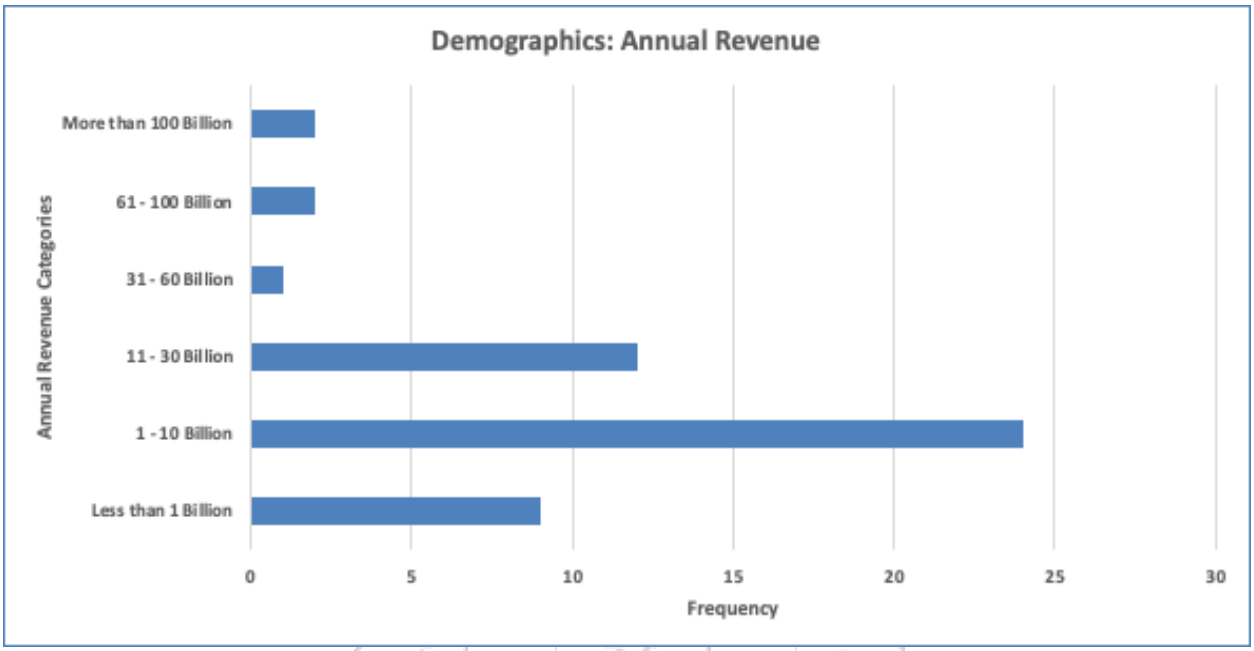

Figure 4.7 Demographics: Annual Revenue

4.3.8. SaaS Adoption Strategy

All the 50 respondents, 100%, indicated that their IT strategy included elements of Cloud (and SaaS) adoption and use, underpinning the fact that Cloud (and SaaS) has become a critical business enabler for their organizations, this finding is consistent with the Psychographic Profiles findings, where not a single organization was found to be a Laggard with respect to SaaS Adoption, majority of the Nairobi Securities Exchange listed companies are innovators and early adopters. The average psychographic profiles score for the population in the Hurt et al., (1977) Scale for the Measurement of Innovativeness was found to be 71, which places the population in the Early Adopters category, and affirms the finding that they all have a Cloud (and SaaS) Adoption Strategy.

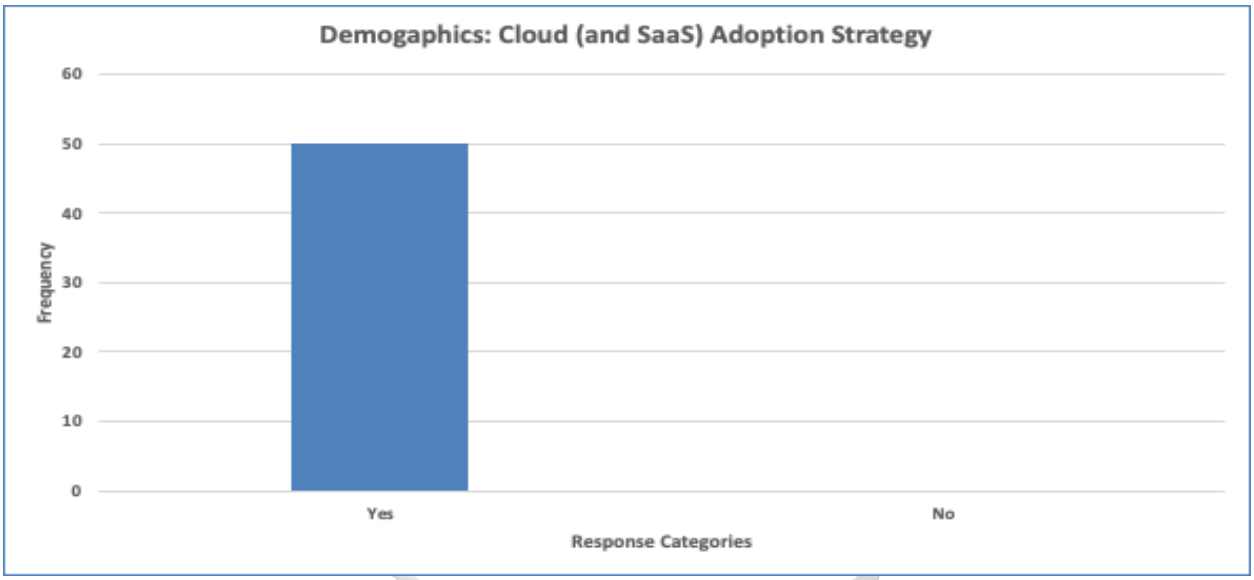

Figure 4.8 Demographics: Cloud (and SaaS) Adoption Strategy

4.4. Research Findings - SaaS Adoption Facilitators

4.4.1. Descriptive Statistics – SaaS Adoption Facilitators

Majority of the respondents agreed with all the SaaS Adoption Facilitators statements, with 60% or more agreeing and strongly agreeing with the statements on SaaS adoption facilitators. A significant percentage, 16% - 34% stated they were neutral to the statements, while minority, 2% - 24%, stated they disagreed with the statements. The means and standard deviations for the responses as tabulated in Appendix VII ranged from 3.56 – 4.36 and 0.7181 – 1.0008 respectively. Compared to the standard deviations for the SaaS Adoption Inhibitors responses, which were lower (0.3666 – 0.5783), it is safe to infer that the SaaS Adoption Facilitators responses data were more spread out away from the means.

Table 4.2 SaaS Adoption Facilitators Responses

Facilitator Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Financial Advantage: SaaS allows customers to shift financial model from CapEx to OpEx thus avoid large upfront spend.	0%	0%	16%	32%	50%

SaaS results in reduced total cost of ownership (TCO) compared to on-premise applications.	0%	0%	16%	40%	38%
Solution Scalability: SaaS delivers freedom to scale up and down depending on demand thus avoid idle capacity.	0%	0%	20%	18%	62%
SaaS enables mobile workforce productivity on any device, any time and from any location.	0%	10%	10%	22%	58%
Top Management Support: Top management support is critical in successful implementation of SaaS as a business enabler.	0%	2%	28%	28%	42%
Top management support is critical in delineating “core” applications of the firm from “context” ones to be outsourced.	0%	16%	20%	34%	30%
Rapid Deployment: SaaS enables shorter time-to-value due to readily configurable standard templates that unlock industry best practices.	0%	4%	34%	36%	26%
SaaS applications are accessible via Internet browsers, as such, no lengthy and tedious configurations on client end.	0%	24%	16%	40%	20%
Industry Pressure: Owing to the competition we face in our industry; we have had to embrace SaaS so that we can focus on our core differentiating activities.	0%	2%	30%	42%	26%

SaaS vendors have played a critical role in creating awareness and knowledge of SaaS business imperatives.	0%	6%	34%	52%	8%

4.4.2. Correlational Analysis and Tests of Hypotheses H_1 – H_5

Spearman's rank correlation coefficient (Spearman's rho) tests were used to assess the relationships between the dependent variable (SaaS Adoption) and the independent variables: Financial Advantage (FA), Solution Scalability (SC), Top Management Support (TMS), Rapid Deployment (RD) and Industry Pressure (IP). According to Saunders et al., (2012), a coefficient of 0 implies perfect independence, 1 implies a perfect positive relationship, between 0 and 0.2 implies no relationship, between 0.2 and 0.35 implies a weak positive relationship, between 0.35 and 0.6 implies a moderate positive relationship, between 0.6 and 0.8 implies a strong positive relationship, between 0.8 and 1 implies very strong positive relationship. For purposes of this study, a cut-off of 0.35 was retained for either upholding the hypotheses (claims) or not upholding them. The tests used 0.05 level of significance, which is also the probability of committing Type I error, 0.05 was preferred as opposed to 0.01, as it also minimizes the probability of committing Type II error.

Table 4.3 SaaS Adoption Facilitators Correlational Analysis

SaaS Adoption Facilitator	Spearman's rho	Significance Level (p value)	Comment
Financial Advantage (FA)	0.3909*	0.0050	Moderate Positive
Solution Scalability (SS)	0.5503*	0.0000	Moderate Positive
Top Management Support (TMS)	0.6244*	0.0000	Strong Positive
Rapid Deployment (RD)	0.9175*	0.0000	Very Strong Positive
Industry Pressure (IP)	0.9379*	0.0000	Very Strong Positive

*Correlation is significant at 0.05 level of significance (2-tailed)

Based on the Spearman's rank correlation coefficient results, there is sufficient statistical evidence to uphold all the hypotheses (claims) on SaaS Adoption Facilitators as they are all above the cut-off criteria of 0.35:

Table 4.4 SaaS Adoption Facilitators Hypotheses Test Results

Hypotheses Tested	Comment
H_1: Financial Advantage is positively associated with SaaS Adoption	Upheld
H_2: Solution Scalability is positively associated with SaaS Adoption	Upheld
H_3: Top Management Support is positively associated with SaaS Adoption	Upheld
H_4: Rapid Deployment is positively associated with SaaS Adoption	Upheld
H_5: Industry Pressure is positively associated with SaaS Adoption	Upheld

4.5. Research Findings - SaaS Adoption Inhibitors

4.5.1. Descriptive Statistics – SaaS Adoption Inhibitors

Majority of the respondents agreed with the SaaS Adoption Inhibitors statements, with 80% or more agreeing and strongly agree with the statements. A few stated they were neutral to the statements, 4% - 20%; none of the respondents disagreed nor strongly disagreed with the statements. The means and standard deviations for the responses as tabulated in Appendix VII ranged from 3.90 – 4.84 and 0.3666 – 0.5783 respectively. Compared to the standard deviations for the SaaS Adoption Facilitators responses, which were higher (0.7181 – 1.0008), it is safe to infer that the SaaS Adoption Inhibitors responses data were more clustered around the means.

Table 4.5 SaaS Adoption Inhibitors Responses

Inhibitor Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Connectivity Constraints: Unreliable connectivity would compromise SaaS application performance and overall end user experience.	0%	0%	8%	70%	22%

High-capacity broadband is expensive and would add to our already high operational costs.	0%	0%	6%	60%	34%
Limited Customization: SaaS offerings are standard and rigid and do not accommodate customer-specific customizations.	0%	0%	20%	70%	10%
SaaS offerings are built with mature businesses in mind paying little regard to those yet to achieve process maturity.	0%	0%	10%	64%	26%
Security: There is little assurance from SaaS vendors that no third parties could access and compromise customer data.	0%	0%	12%	72%	16%
Enabling access on mobile devices presents additional security challenges which must be addressed at incremental spend.	0%	0%	4%	52%	44%
Integration Challenges: SaaS integration with legacy applications can be daunting where there are no APIs and/or Enterprise Service Bus for integration.	0%	0%	8%	72%	20%
SaaS vendors hardly adopt open standards to support integration and interoperability among themselves.	0%	0%	0%	16%	84%
Vendor Lock-in:	0%	0%	8%	66%	26%

Most SaaS contracts are three to five years, as such, there is fear of being locked-in for the period even when service being received is inferior.					
Cost of migration from an existing SaaS vendor offering inferior service can be prohibitive thus sustaining the Vendor Lock-in.	0%	0%	0%	16%	84%

4.5.2. Correlational Analysis and Tests of Hypotheses H_6 – H_{10}

Spearman's rank correlation coefficient (Spearman's rho) tests were used to assess the relationships between the dependent variable (SaaS Adoption) and the independent variables: Connectivity Constraints (CC), Limited Customization (LC), Security Concerns (SC), Integration Challenges (IC) and Vendor Lock-In (VLI). According to Saunders et al., (2012), a coefficient of 0 implies perfect independence, -1 implies a perfect negative relationship, between 0 and -0.2 implies no relationship, between -0.2 and -0.35 implies a weak negative relationship, between -0.35 and -0.6 implies a moderate negative relationship, between -0.6 and -0.8 implies a strong negative relationship, between -0.8 and -1 implies a very strong positive relationship. For purposes of this study, a cut-off of -0.35 was retained for either upholding the hypotheses (claims) or not upholding them. The tests used 0.05 level of significance, which is also the probability of committing Type I error, 0.05 was preferred as opposed to 0.01, as it also minimizes the probability of committing Type II error.

Table 4.6 SaaS Adoption Inhibitors Correlational Analysis

SaaS Adoption Inhibitor	Spearman's rho	Significance Level (p value)	Comment
Connectivity Constraints (CC)	-0.3265*	0.0206	Weak Negative
Limited Customization (LC)	-0.2881*	0.0424	Weak Negative
Security Concerns (SC)	-0.2809*	0.0482	Weak Negative
Integration Challenges (IC)	-0.3757*	0.0072	Moderate Negative
Vendor Lock-In (VLI)	-0.3333*	0.0180	Weak Negative

*Correlation is significant at 0.05 level of significance (2-tailed)

Based on the Spearman's rank correlation coefficient results, there is sufficient statistical evidence to only uphold the hypothesis (claim) on Integration Challenges as a SaaS Inhibitor, all the other hypotheses (claims) on SaaS Inhibitors are not upheld because they do not meet the cut-off criteria of -0.35:

Table 4.7 SaaS Adoption Inhibitors Hypotheses Test Results

Hypotheses Tested	**Comment**
H_6: Connectivity Constraints is negatively associated with SaaS Adoption	Not Upheld
H_7: Limited Customization is negatively associated with SaaS Adoption	Not Upheld
H_8: Security Concerns is negatively associated with SaaS Adoption	Not Upheld
H_9: Integration Challenges is negatively associated with SaaS Adoption	Upheld
H_{10}: Vendor Lock-In is negatively associated with SaaS Adoption	Not Upheld

4.6. Research Findings – SaaS Adoption Psychographic Profiles

4.6.1. Descriptive Statistics – SaaS Adoption Psychographic Profiles

These were established by having the respondents answer a set of twenty questions adopted and modified from scales for the measurement of innovativeness survey instrument developed by Hurt et al., (1977). In the survey instrument administered to the respondents, these questions were 29 to 48. The Likert scale data obtained, for each respondent, were coded then scored using the following steps:

Step 1: Add the scores for items 32, 34, 35, 38, 41, 43, 45, and 48.
Step 2: Add the scores for items 29, 30, 31, 33, 36, 37, 39, 40, 42, 44, 46, and 47.
Step 3: Complete the following formula: II = 42 + total score for Step 2 - total score for Step 1.

Once the individual scores of the respondent organizations were obtained, they were interpreted as follows:

Scores above 80 are classified as Innovators.
Scores between 69 and 80 are classified as Early Adopters.
Scores between 57 and 68 are classified as Early Majority.

Scores between 46 and 56 are classified as Late Majority.
Scores below 46 are classified as Laggards/Traditionalists.

Detailed tabulation of the population SaaS Adoption Psychographic Profiles are set out in Appendix VI and the summary is captured in the right-skewed bar chart below, meaning majority of the Nairobi Securities Exchange listed companies are either Innovators or Early Adopters. Not a single respondent organization was found to be a Laggard, which finding is consistent with the findings of Kituku (2012) that NSE listed companies are pioneers in technology adoption and that their non-listed counterparts look up to them and tend to benchmark with them on technology adoption. The mean score for the population was found to be 71 in the Scales for Measurement of Innovativeness (Hurt et al., 1977), implying the population has an overall psychographic profile of Early Adopters.

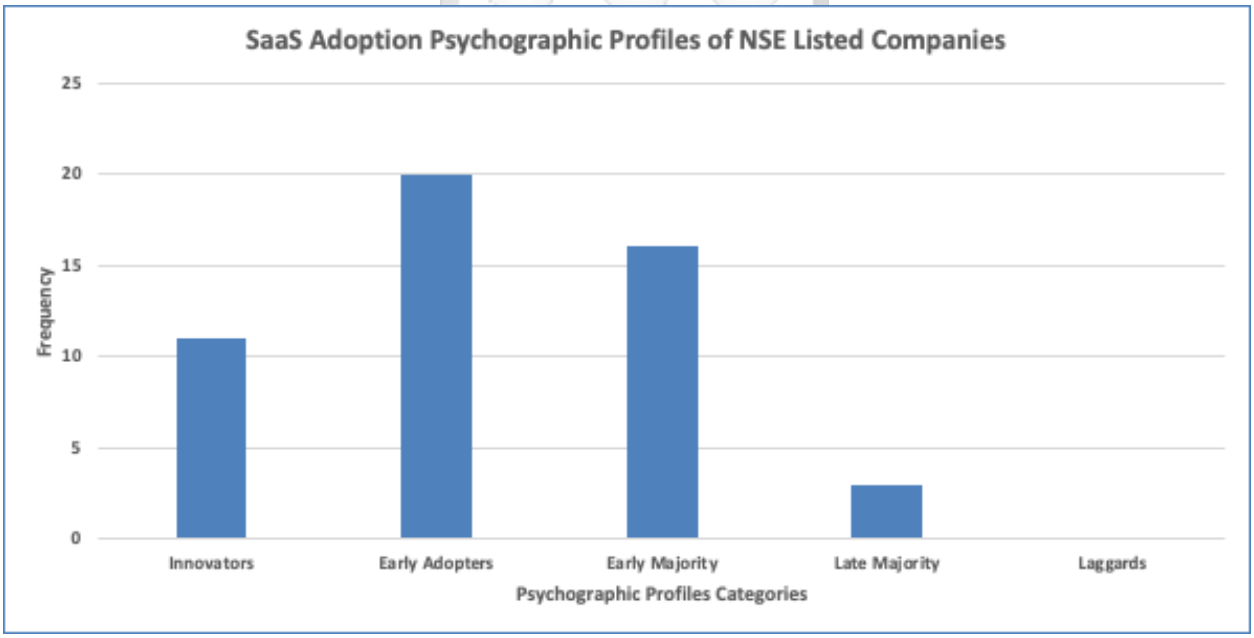

Figure 4.9 SaaS Adoption Psychographic Profiles of NSE Listed Companies

4.6.2. Correlational Analysis and Test of Hypothesis H_{11}

Spearman's rank correlation coefficient (Spearman's rho) tests were used to assess the relationship between the dependent variable (SaaS Adoption) and the independent variable Psychographic Profiles (PP). According to Saunders et al., (2012), a coefficient of 0 implies perfect independence, 1 implies a perfect positive relationship, between 0 and 0.2 implies no relationship, between 0.2 and 0.35 implies a weak positive relationship, between 0.35 and 0.6

implies a moderate positive relationship, between 0.6 and 0.8 implies a strong positive relationship, between 0.8 and 1 implies a very strong positive relationship. For purposes of this study, a cut-off of 0.35 was retained for either upholding the hypothesis (claim) or not upholding it. The test used 0.05 level of significance, which is also the probability of committing Type I error, 0.05 was preferred as opposed to 0.01, as it also minimizes the probability of committing Type II error.

Table 4.8 SaaS Adoption Psychographic Profiles Correlational Analysis

SaaS Adoption Psychographic Profiles	Spearman's rho	Significance Level (p value)	Comment
Psychographic Profiles	0.4244*	0.0021	Moderate Positive

*Correlation is significant at 0.05 level of significance (2-tailed)

Based on the Spearman's rank correlation coefficient result, there is sufficient statistical evidence to uphold the Psychographic Profiles hypothesis (claim) on SaaS Adoption.

Table 4.9 SaaS Adoption Psychographic Profiles Hypothesis Test Result

Hypotheses Tested	Comment
$\mathbf{H_{11}}$: Psychographic Profiles is positively associated with SaaS Adoption	Upheld

4.7. Research Findings – Software as a Service Adoption

4.7.1. Descriptive Statistics – SaaS Adoption Application Types

Majority of the respondent organizations had all adopted SaaS based applications for email, team meetings, office productivity, instant messaging, social media, security and threat intelligence. Social Media registered the lowest at 72% adoption rate perhaps because of the perceived risks that the non-adopting organizations consider are inherent in using social media. The SaaS applications in this category registered an average of 85% adoption rate of the population, and this could be so because this class of applications are of low strategic value compared to ERP workloads.

Table 4.10 SaaS Adoption Application Types

SaaS Application	Number who have adopted	% who have adopted
Enterprise Email	48	96%
Team Meetings	48	96%
Office Productivity	42	84%
Instant Messaging	41	82%
Social Media	36	72%
Security & Threat Intelligence	39	78%

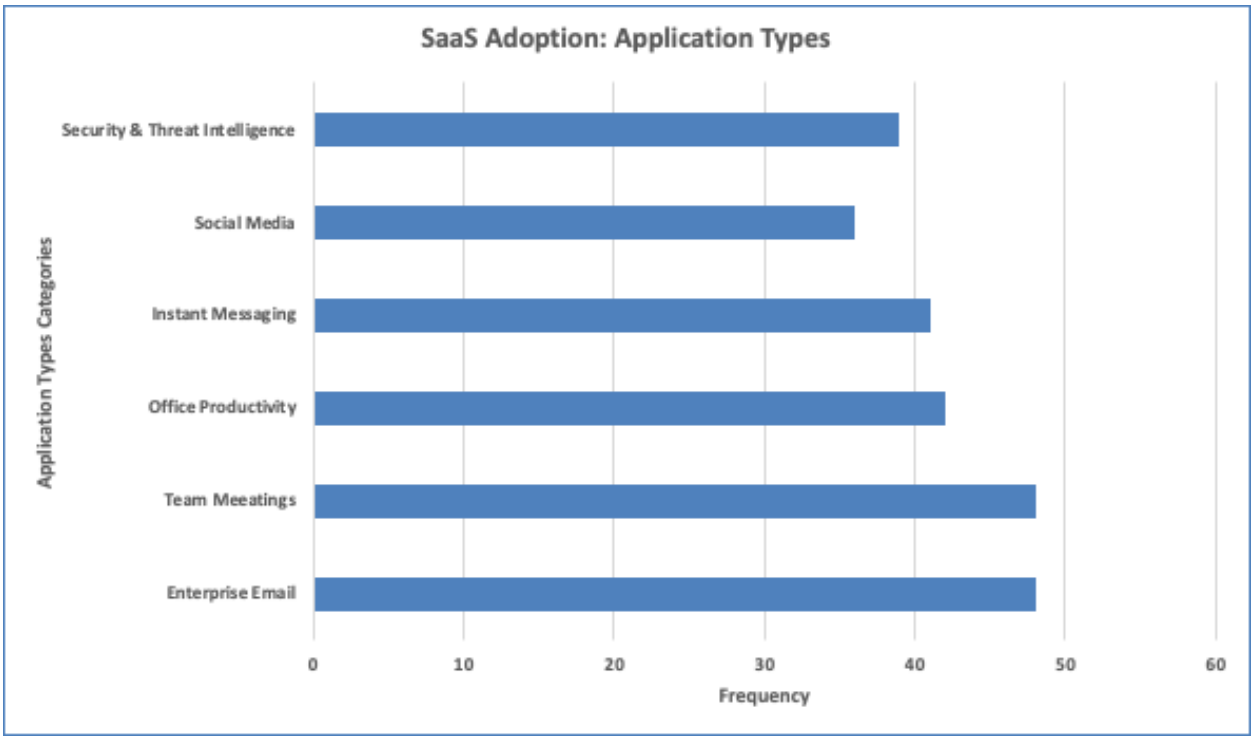

Figure 4.10 SaaS Adoption: Application Types

4.7.2. Descriptive Statistics – Workloads already moved to the Cloud

There were varying levels of workloads already moved to the cloud, generally most of these workloads are of strategic importance to organizations, and most organizations tend to take lengthy decision cycles before embarking on a cloud migration journey for these categories of applications. An average of 34% adoption rate of the ERP workloads in the cloud was recorded, and this could be so because this bucket consists of application workloads of high strategic value.

Table 4.11 SaaS Adoption: Workloads already moved to the Cloud

Workload	Number moved to cloud	% moved to cloud
Finance and Accounting	20	40%
Human Resource Management	27	54%
Procurement	25	50%
Sales Force Automation	17	34%
Customer Relationship Management	18	36%
Payroll	14	28%
Project Management	15	30%
Application Development	15	30%
Other	4	8%

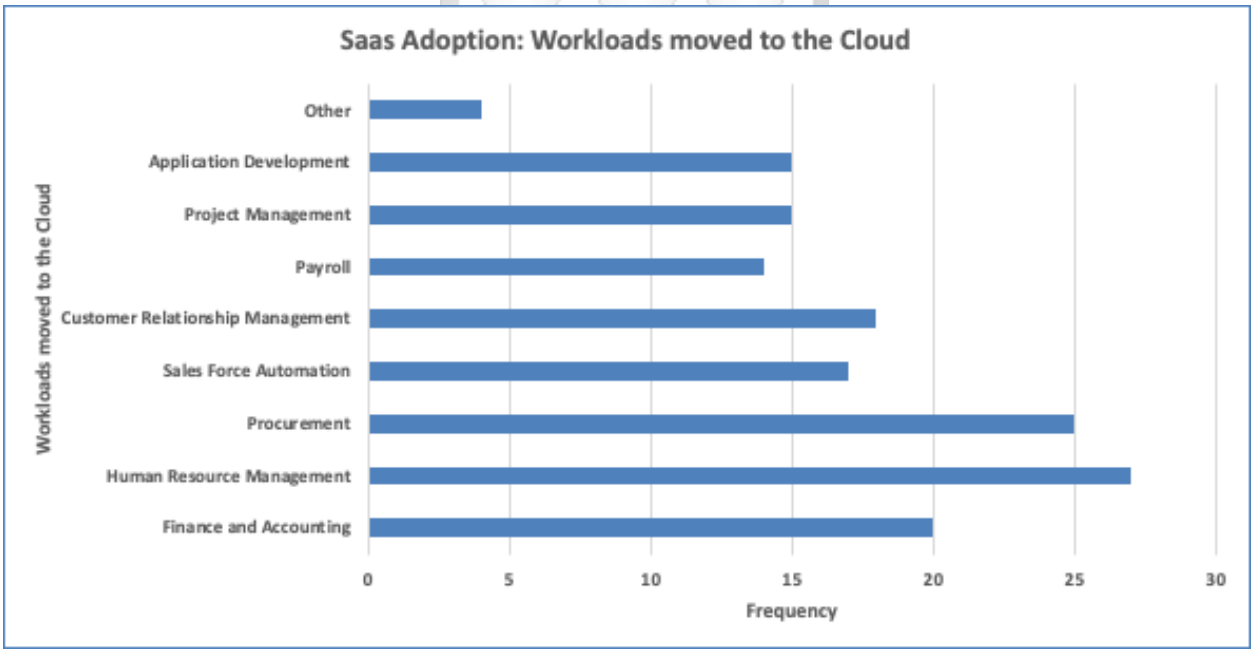

Figure 4.11 SaaS Adoption: Workloads already moved to the Cloud

4.7.3. Descriptive Statistics – Percentage of Application Budget allocated to SaaS

The modal value was found to be less than 11%, while only 6% were spending more than 40% of the applications budgets on SaaS. Attributed to the relatively low spend could be the fact that SaaS by its nature allows for annuity-based consumption model as opposed to large upfront capital expenditure. Additionally, only an overage of 34% adoption rate of the ERP workloads in the cloud, which are of high strategic value, had been moved to the cloud compared to email,

team meetings, office productivity, instant messaging, social media, security and threat intelligence applications which had an average adoption rate of 85%, owing to their low strategic value for most organizations, save for Security and Threat Intelligence solutions.

Table 4.12 SaaS Adoption: Percentage of Application Budget allocated to SaaS

SaaS Budget as a Percentage of Application Budget	Frequency	Percentage
Less than 11%	15	30%
11 – 20%	12	24%
21 – 30%	10	20%
31 – 40%	10	20%
More than 40%	3	6%
Total	50	100%

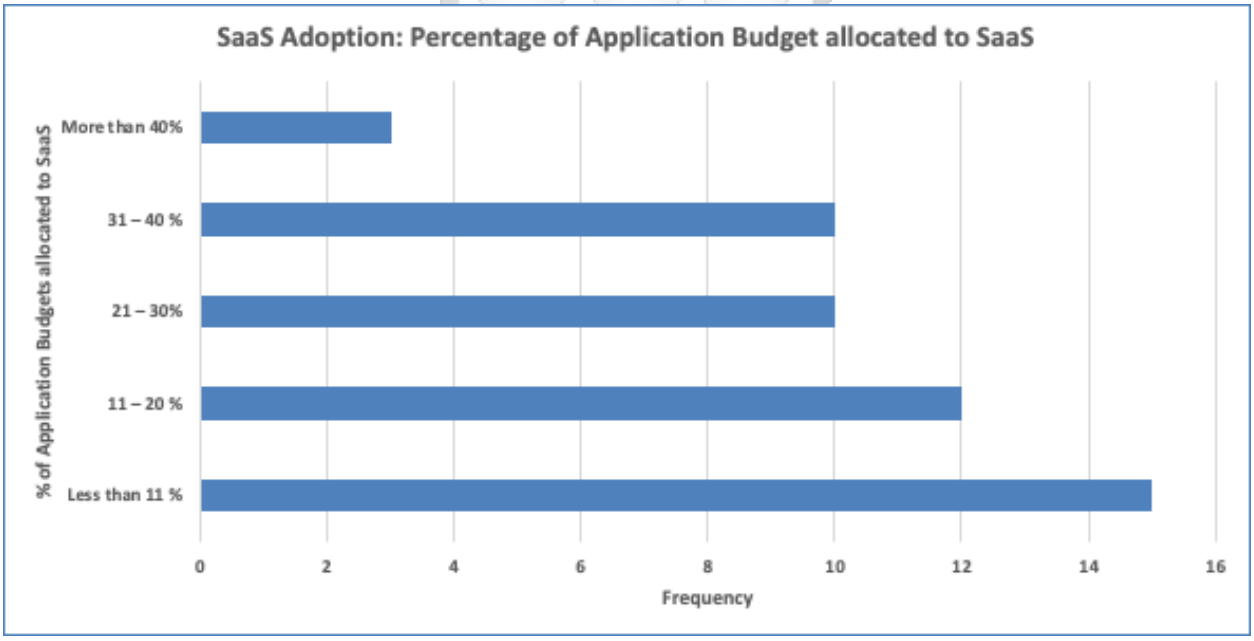

Figure 4.12 SaaS Adoption: Percentage of Application Budget allocated to SaaS

4.8. Summary of Research Findings

All the SaaS Adoption Facilitators were found to have moderate positive to very strong positive correlation with SaaS Adoption, implying they facilitate SaaS adoption; while of the five SaaS Adoption Inhibitors, only Integration Challenges was found to have a moderate negative correlation with SaaS Adoption, implying it inhibits SaaS adoption; all the other four inhibitors, Connectivity Constraints, Limited Customization, Security Concerns and Vendor Lock-In, were

found to have weak negative correlation with SaaS, as such their inhibition to SaaS adoption was found to be insignificant according to the cut-off criteria of -0.35 score in the Spearman's rank correlation coefficient scale. The SaaS Adoption Psychographic Profiles established had a moderate positive correlation with SaaS Adoption, implying it facilitates SaaS adoption.

Table 4.13 Summary of Research Findings

Independent Variable	**Strength of relationship with the Dependent Variable, SaaS Adoption (SA)**
Financial Advantage (FA)	Moderate Positive
Solution Scalability (SS)	Moderate Positive
Top Management Support (TMS)	Strong Positive
Rapid Deployment (RD)	Very Strong Positive
Industry Pressure (IP)	Very Strong Positive
Connectivity Constraints (CC)	Weak Negative
Limited Customization (LC)	Weak Negative
Security Concerns (SC)	Weak Negative
Integration Challenges (IC)	Moderate Negative
Vendor Lock-In (VLI)	Weak Negative
Psychographic Profiles (PP)	Moderate Positive

CHAPTER 5: DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1. Introduction

This section discusses the main research findings of the study, and summarizes how the study answered the research objectives. It also highlights recommendations arising from the study as well as areas for further research.

5.2. Discussion and Conclusion

5.2.1. SaaS Adoption Facilitators

The first objective of the study was to investigate the relationships, if any, between SaaS Adoption Facilitators and SaaS Adoption by NSE listed companies, whereupon five hypotheses (claims) were formulated based on reviews of previous research. The study established that all the five facilitators (independent variables), namely Financial Advantage, Solution Scalability, Top Management Support, Rapid Deployment and Industry Pressure, had moderately positive to very strong positive correlation with SaaS Adoption (dependent variable). This finding is consistent with the findings of Lee at al., (2013), Chang (2020), Safari et al., (2015), Wu and Lan (2011), Benlian and Hess (2011), that found the same to be influential factors of SaaS adoption.

Financial Advantage (H_1) has remained one of the strong facilitators of SaaS Adoption. The SaaS consumption model allows customers to pay for services as opposed to paying for software, and the payments are staggered over a period of time. This arrangement gives many organizations the advantage of avoiding large upfront capital expenditure associated with many on-premise applications. Moreover, organizations are able to avoid having a large pool of skilled employee resources normally associated with on-premise software implementations. This finding is consistent with Wu and Lan (2011) findings that SaaS confers the adopting organizations with many financial benefits arising from: paying for only what is used, easy and fast deployments to end users, staggered payments over a period of time, smaller in-house IT staff to provide support and the fact that the latest features (upgrades) come at no extra spend. Benlian and Hess (2011) also re-affirmed the cost benefits that accrue to SaaS adopters besides allowing them to focus more on their “core” differentiating activities.

Solution Scalability (H_2) as a variable in this study was defined as the flexibility to scale up or down, depending on utilization demand, as such, helping organizations avoid idle capacity associated with many on-premise applications. The other element of Solution Scalability is the ability of the adopting organizations to enable mobile workforce productivity, given that SaaS applications are accessed via the Internet and are device agnostic, thus guaranteeing seamless end user experiences irrespective of device, location and time. The Covid-19 pandemic disrupted work as we all have come to appreciate, and many organizations have been forced to allow remote working as a way of getting work done while preventing the spread of the Covid-19 pandemic. Organizations that had earlier embraced SaaS did not experience much disruptions in their operations, those that had not, had to make sudden investments to support mobile workforce productivity. According to Gartner (2021), of all cloud offerings, software-as-a-service (SaaS) remained the largest market segment and was forecast to grow to $145.4 billion in 2022, as organizations increase investments in mobility, collaboration, and other remote working technologies.

Top Management Support (H_3) is critical in all technology investments, not just SaaS Adoption. Equally, Top Management is critical in delineating what is considered to be “context” IT functions for SaaS-based outsourcing. This is primarily so because Top Management is responsible for allocating organizational financial resources as well as prioritization of all technology investments. Top Management Support therefore continues to be a major facilitator and catalyst for SaaS Adoption. The finding on Top Management Support as a significant facilitator of SaaS Adoption is consistent with the findings of Yigitbasioglu (2015) that there is continued importance of Top Management Support in the adoption of new technologies. The finding also affirms the findings of Oliveira et al., (2019) that Top Management Support influences SaaS Adoption as it promotes the firm’s consensual decision to adopt SaaS, diminishing the struggle over its rejection.

Rapid Deployment (H_4) of SaaS applications is underpinned by the fact that end-users access SaaS applications via the Internet and therefore avoid the lengthy and tedious client-end configurations associated with most on-premise applications. Equally, most SaaS applications come in standard configurable templates that help shorten time-to-value owing to faster implementation lead times. The findings on Rapid Deployment in having a positive correlation with SaaS Adoption by NSE listed companies is consistent with the findings of Lee et al., (2013) that Rapid Deployment and Reduced Costs were the strongest economic factors and drivers of SaaS adoption in South Korea.

Industry Pressure (H_5) consists of the activities of the competitors and those of SaaS vendors that necessitate and/or drive SaaS adoption. Moore (2014) wrote extensively on the need for organizations to focus more on their "core" differentiating activities to create a competitive edge. They further posit that focus on "core" differentiating activities is best enabled when organizations identify and outsource "context" non-differentiating activities, and these include elements of IT infrastructure that they use to run their operations. From the lens of "core" versus "context", it makes sense for organizations to adopt SaaS, particularly for low strategic value applications, in order to maintain their competitive edge in the marketplace. SaaS vendors have equally made significant investments by opening local offices and training local resources in order to make customer journeys to the cloud frictionless. This finding is consistent with Chang et al., (2020) findings that companies are likely to adopt SaaS because of the recommendation and requirement of their business partners, and that if their competitors are using SaaS, they will be forced to follow the crowd to remain competitive in the industry.

5.2.2. SaaS Adoption Inhibitors

The second objective of the study was to investigate the relationships, if any, between SaaS Adoption Inhibitors and SaaS Adoption by NSE listed companies, again whereupon five hypotheses (claims) were formulated based on reviews of previous research. The study established that only Integration Challenges had a moderately negative relationship with SaaS Adoption as it met the cut-off criteria of -0.35 in terms of Spearman's rank correlation coefficient. All the other inhibitors, namely Connectivity Constraints, Limited Customization, Security Concerns and Vendor Lock-In were found to have weak negative relationships with SaaS Adoption, as such their corresponding hypotheses (claims) were not upheld.

The findings on Connectivity Constraints, Limited Customization, Security Concerns and Vendor Lock-In differ with those of Lee at al., (2013), Safari et al., (2015) and Madisha (2012). This may be explained by the continued effort of all actors namely Government of Kenya, SaaS vendors, IT service providers and all other players in the ecosystem, who have organically sought to help confront the traditional inhibitors of SaaS adoption.

Broadband, for example, has become widely available given the six major under-sea fiber cables terminated at the Coast (TEAMS, EASSy, SEACOM, DARE, PEACE and LION2); in-country the

Kenya Government has successfully laid an extensive NOFBI fiber network to all the 47 counties, the telcos namely Safaricom PLC, Airtel Kenya Limited, Telkom Kenya Limited, Jami Telecom, Liquid Telecom and Wananchi, just mention a few, all have extensive fiber networks across the country in their aggressive growth plans to take their services closer to their customers irrespective of geographical locations. On the mobile side of things, 3G, 4G and most recently 5G technologies have extensively been deployed all over the country, and very well augment the fiber networks to make broadband pervasively available. CA on its part, has used the Universal Fund as an equalization fund to champion connectivity in rural and other remote parts of the country. In a sense, therefore, broadband has been "democratized", with previous customer objections around price and reliability, fairly dealt with. The foregoing perhaps explain why Connectivity Constraints (H_6) was viewed by the respondents as not such a significant inhibitor of SaaS Adoption.

Regarding Limited Customization (H_7) as an inhibitor and its weak association with SaaS Adoption, there have been several developments and concessions by SaaS vendors. Most SaaS applications today are highly configurable compared to their less configurable standard predecessors, and this is in realization by SaaS vendors that there is no one size that fits all. Every customer and every industry are unique. SaaS vendors have invested heavily in industry specific solutions that have fueled SaaS uptake, as these speak directly to the customer requirements and therefore limit the need for extensive customizations. There has also been a steady proliferation of highly-skilled software engineers, given the aggressive effort by SaaS vendors to build local skills to support their customers better, this allows for affordable services should customization be needed.

Security Concerns (H_8) has always topped the list of inhibitors when it comes to customer objections against SaaS Adoption, while this is so, the study found that 78% of NSE listed companies were using SaaS-based security and threat intelligence solutions in their operations. Many organizations have come to the realization that it does not help much to be paranoid, and that on-premise security assets backed by highly trained security professionals, are not only expensive and prohibitive, but such investments do not guarantee foolproof security of their IT assets given the fast-evolving IT risks landscape. So much so that, an on-premise investment on security infrastructure can be rendered obsolete in just a couple of months. It makes a lot more sense for many organizations, therefore, to adopt security-as-a-service models and avoid having to deal with the high price of rapid obsolescence. This finding on Security Concerns as a SaaS

Adoption inhibitor is at variance with those of Wu and Lan (2011), Benlian and Hess (2011), Lee et al., (2013) who all found Security to be a significant inhibitor of SaaS Adoption. However, the findings are consistent with those of Oliveira et al., (2014) that posit that recent advances in privacy-enhancing techniques, monitoring mechanisms, and encryption schemes to ensure confidentiality, integrity, and the security of data in the cloud environment have defrayed Security Concerns as an inhibitor of SaaS adoption.

Vendor Lock-In (H_{10}) too has been a major concern for many organizations since traditionally most SaaS vendors entered long contracts with their customers to safeguard themselves from early exits by customers who became disgruntled with their services. It has been opined that the long contracts were largely to enable the SaaS vendors recoup their heavy research and development costs given the annuity-based consumption model of SaaS applications. Majority of SaaS contracts have dropped to as low as one-year subscriptions with money-back guarantees should customers find the services inferior. This flexibility in contracting has helped SaaS vendors address the Vendor lock-In fear which many customers had/have.

Regarding Integration Challenges (H_9) which the study found to have a moderately negative association with SaaS Adoption, it could be that majority of customers still have significant footprints of legacy on-premise applications, and most SaaS vendors have not yet fully embraced open standards in their software development. As such, organizations are forced to make heavy investments on service-oriented architecture IT assets that allow for friction-less integrations. Other approaches include API (Application Programming Interface) based integrations which are equally expensive and require highly-skilled resources to realize. Moreover, SaaS vendors' unwillingness to embrace open standards, make interoperability and integration among different SaaS applications a nightmare. Some of the on-premise applications are developed without factoring modern API-based integration features, as such organizations are forced to resort to achieve integrations with SaaS applications via interfaces, which result in complex, unreliable and expensive architectures. More needs to be done by SaaS vendors and software developers in general to build products that are easy to integrate, by resolving to embrace open standards they will be one step in the right direction in overcoming objections associated with integration challenges.

5.2.3. SaaS Adoption Psychographic Profiles

The third and final objective of the study was to investigate the relationship, if any, between SaaS Adoption Psychographic Profiles (H_{11}) and SaaS Adoption by NSE listed companies. In order to do this, the individual SaaS Adoption Psychographic Profiles of the listed companies were first established using a modified Scales for the Measurement of Innovativeness questionnaire developed by Hurt et al., (1977). The various adopter categories (innovators, early adopters, early majority and late majority, no single laggard was found among the responding organizations) identified in the population respond differently to the marketing activities of SaaS vendors, and explain why the responding organizations were at varying levels of SaaS adoption. The formulated hypothesis, H_{11}, was upheld as it was found to have a moderately positive relationship with SaaS Adoption. This finding would be helpful to SaaS vendors in tailoring their messaging for better uptake of SaaS applications, particularly ERP workloads which stood at an average of 34% adoption rate.

5.2.4. SaaS Adoption

As a dependent variable, it was established that NSE listed companies were at varying levels of SaaS Adoption. This may be attributed to the individual Psychographic Profiles of the NSE listed companies as well as the impact of the SaaS Adoption Facilitators and SaaS Adoption Inhibitors on decision making cycles. This finding presents an opportunity to SaaS vendors in their quest to onboard NSE listed companies to their SaaS offerings. In particular, they need to improve on their offerings to specifically deal with Integration Challenges which was found to be the main inhibitor. While the other inhibitors were found to have weak negative relationships with SaaS Adoption, it would be important that all stakeholders in the IT ecosystem continue to play their roles in addressing them, and other inhibitors not tested in this study. The SaaS Adoption findings affirm the findings of Benlian et al., (20019) that Office and Collaboration applications with lower levels of specificity, strategic significance, and adoption uncertainty had the highest adoption rates, and by contrast, ERP workloads with higher levels of specificity, strategic significance, and adoption uncertainty ranked among the applications with the lowest SaaS adoption rates. The fact that the modal value of 11% of applications budgets were being allocated to SaaS based outsourcing presents an opportunity for SaaS vendors to grow in this market.

5.3. Recommendations

This study makes a contribution to the growing empirical literature on cloud computing adoption in Kenya (e.g., Njaaga, 2019; Mwaniki & Ondiek, 2018; Tiren, 2017; Ondiek, 2016; Oduor, 2016; Bitta, 2012; Kituku, 2012) through the application of multi-theoretical frameworks of DOI (Diffusion of Innovations) and TOE (Technology, Organization and Environment). Previous studies on SaaS and Cloud Computing adoption in Kenya did not seek to establish the psychographic profiles of their target populations. This study, therefore, provides a new theoretical lens which can be used to interpret organizations' propensity to adopt SaaS and other cloud computing offerings.

As with every study, this study had a number of limitations which should lead to new avenues of further research. In particular, the list of SaaS Adoption Facilitators and SaaS Adoption Inhibitors was not exhaustive, and therefore the study can be repeated with a fresh set of SaaS Adoption Facilitators and SaaS Adoption Inhibitors. The study was also limited to testing the existing relationships between the SaaS Adoption Facilitators, SaaS Adoption Inhibitors and SaaS Adoption Psychographic Profiles on one hand and SaaS Adoption on the other. Future studies should test the strength of a cause-and-effect relationship between the dependent and independent variables through suitable regression models. Finally, the key informants for this study were mainly from the IT function, future studies should seek key informants beyond the IT function like Finance and Procurement, to minimize informant bias.

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APPENDICES

Appendix I: Research Facilitation Letter

Ole Sangale Rd, Madaraka Estate,
P/O Box 59857 00200,Nairobi, Kenya.
Cell: +254 703 414/6/7, Twitter: @SBSKenya
Email: info@sbs.ac.ke or visit www.sbs.strathmore.edu

Strathmore UNIVERSITY
BUSINESS SCHOOL

31st May 2022

To Whom It May Concern.

Dear Sir/ Madam.

RE: FACILITATION OF RESEARCH – MOSES OMONDI ALUODO

This is to introduce Moses Aluodo who is a Master of Business Administration student at Strathmore University Business School, admission number MBA/76892/13. As part of our MBA Program, Moses is expected to do applied research and undertake a project. This is in partial fulfilment of the requirements of the MBA course. To this effect, he would like to request for appropriate data from your organization.

Moses is undertaking a research paper on **"Determinants of Software as a Service Adoption Among Nairobi Securities Exchange Listed Companies"** The information obtained from your organization shall be treated confidentially and shall be used for academic purposes only.

Our MBA seeks to establish links with industry, and one of these ways is by directing our research to areas that would be of direct use to industry. We would be glad to share our findings with you after the research, and we trust that you will find them of great interest and of practical value to your organization.

We appreciate your support and shall be willing to provide any further information if required.

Yours sincerely,

Caroline Tiara.
Manager – Graduate Programs.
Strathmore University Business School.

Strathmore Business School is a Proud member of:

Association of African Business Schools AABS EFMD AACSB

Appendix II: Ethics Review Letter

Strathmore UNIVERSITY

30th May 2022

Mr Aluodo Moses,
maluodo@hotmail.com

Dear Mr Aluodo,

RE: Determinants of Saas Adoption Among Nse Listed Companies.

This is to inform you that SU-IERC has reviewed and **approved** your above **SU Masters'** research proposal. Your application reference number is **SU-IERC1353/22.** The approval period is **30th May 2022 to 29th May 2023.**

This approval is subject to compliance with the following requirements:

i. Only approved documents including (informed consents, study instruments, MTA) will be used
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-IERC.
iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-IERC within 48 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to SU-IERC within 48 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days upon completion of the study to SU-IERC.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology, and Innovation (NACOSTI) https://research-portal.nacosti.go.ke/ and obtain other clearances needed.

Yours sincerely,

for: **Dr Ben Ngoye,**
Secretary; SU-IERC

STRATHMORE UNIVERSITY INSTITUTIONAL ETHICS REVIEW COMMITTEE (SU-IERC)
30 May 2022
Email:ethicsreview@strathmore.edu
P.O BOX 59857-00200
NAIROBI-KENYA

Cc: Prof Fred Were,
Chairperson; SU-IERC

Ole Sangale Rd, Madaraka Estate. PO Box 59857-00200, Nairobi, Kenya. Tel +254 (0)703 034000
Email admissions@strathmore.edu www.strathmore.edu

Appendix III: NACOSTI Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 296509

Date of Issue: 02/June/2022

RESEARCH LICENSE

This is to Certify that Mr.. Moses Aluodo of Strathmore University, has been licensed to conduct research in Nairobi on the topic: Determinants of Software as a Service Adoption Among Nairobi Securities Exchange Listed Companies for the period ending : 02/June/2023.

License No: NACOSTI/P/22/18032

296509

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

Appendix IV: Survey Questionnaire

Section A: Respondent Demographics

1. What is your gender? [ ] Male [ ] Female

2. Which one of the following best describes your position?
   [ ] Chief Information Officer
   [ ] Information Technology Manager
   [ ] Business Systems Manager
   [ ] Other

3. What is your level of education?
   [ ] Diploma
   [ ] Bachelor's Degree
   [ ] Master's Degree
   [ ] Doctorate

4. How long have you been in the ICT industry?
   [ ] 2 years or Less
   [ ] 3 – 5 years
   [ ] 6 – 8 years
   [ ] 9 years or More

5. Which industry does your organization operate in?
   [ ] Agricultural
   [ ] Automobiles & Accessories
   [ ] Banking
   [ ] Commercial & Services
   [ ] Construction & Allied
   [ ] Energy & Petroleum
   [ ] Insurance
   [ ] Investment
   [ ] Investment Services
   [ ] Manufacturing & Allied
   [ ] Telecommunication

[ ] Real Estate Investment Trust

6. How many employees does your company have?
   [ ] 100 or Less
   [ ] 101 - 250
   [ ] 251 - 500
   [ ] 501 - 1000
   [ ] 1001 - 2000
   [ ] 2001 - 4000
   [ ] 4001 or More

7. What is the average annual revenue in Kenya Shillings of your company?
   [ ] Less than 1 Billion
   [ ] 1 - 10 Billion
   [ ] 11 - 30 Billion
   [ ] 31 - 60 Billion
   [ ] 61 - 100 Billion
   [ ] More than 100 Billion

8. Does your IT strategy include Cloud Computing and/or SaaS adoption and use?
   [ ] Yes
   [ ] No

Section B: SaaS Adoption Facilitators

How strongly do you agree or disagree with the following statements regarding software as a service adoption facilitators? Please indicate the degree to which each statement applies to you as an organization by marking whether you: Strongly Disagree = 1; Disagree = 2; are Neutral = 3; Agree = 4; Strongly Agree = 5

Facilitator Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Financial Advantage: 9. SaaS allows customers to shift financial model from CapEx to OpEx thus avoid large upfront spend.					
10. SaaS results in reduced total cost of ownership (TCO) compared to on-premise applications.					
Solution Scalability: 11. SaaS delivers freedom to scale up and down depending on demand thus avoid idle capacity.					
12. SaaS enables mobile workforce productivity on any device, any time and from any location.					
Top Management Support: 13. Top management support is critical in successful implementation of SaaS as a business enabler.					
14. Top management support is critical in delineating “core” applications of the firm from “context” ones to be outsourced.					

Rapid Deployment: 15. SaaS enables shorter time-to-value due to readily configurable standard templates that unlock industry best practices.					
16. SaaS applications are accessible via Internet browsers, as such, no lengthy and tedious configurations on client end.					
Industry Pressure: 17. Owing to the competition we face in our industry; we have had to embrace SaaS so that we can focus on our core differentiating activities.					
18. SaaS vendors have played a critical role in creating awareness and knowledge of SaaS business imperatives.					

Section C: SaaS Adoption Inhibitors

How strongly do you agree or disagree with the following statements regarding software as a service adoption inhibitors? Please indicate the degree to which each statement applies to you as an organization by marking whether you: Strongly Disagree = 1; Disagree = 2; are Neutral = 3; Agree = 4; Strongly Agree = 5

Inhibitor Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Connectivity Constraints: 19. Unreliable connectivity would compromise SaaS application performance and overall end user experience.					
20. High-capacity broadband is expensive and would add to our already high operational costs.					
Limited Customization: 21. SaaS offerings are standard and rigid and do not accommodate customer-specific customizations.					
22. SaaS offerings are built with mature businesses in mind paying little regard to those yet to achieve process maturity.					
Security: 23. There is little assurance from SaaS vendors that no third parties could access and compromise customer data.					
24. Enabling access on mobile devices presents additional security					

challenges which must be addressed at incremental spend.					
Integration Challenges: 25. SaaS integration with legacy applications can be daunting where there are no APIs and/or Enterprise Service Bus for integration.					
26. SaaS vendors hardly adopt open standards to support integration and interoperability among themselves.					
Vendor Lock-in: 27. Most SaaS contracts are three to five years, as such, there is fear of being locked-in for the period even when service being received is inferior.					
28. Cost of migration from an existing SaaS vendor offering inferior service can be prohibitive thus sustaining the Vendor Lock-in.					

Section D: SaaS Adoption Psychographic Profiles

Directions: Organizations respond to their environment in different ways. The statements below refer to some of the ways organizations can respond. Please indicate the degree to which each statement applies to you as an organization by marking whether you: Strongly Disagree = 1; Disagree = 2; are Neutral = 3; Agree = 4; Strongly Agree = 5. Please work quickly, there are no right or wrong answers, just record your first impression.

Psychographic Profile Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
29. Our peers often ask us for advice and/or information regarding SaaS adoption and use.					
30. We enjoy trying new innovations like SaaS to uncover potential business outcomes.					
31. We seek out new innovations, like SaaS, to run our business operations better.					
32. We are generally cautious about accepting new innovations like SaaS.					
33. We frequently improvise methods for solving a problem when an answer is not apparent.					
34. We are suspicious of new innovations and new ways of thinking, SaaS being one of them.					
35. We rarely trust new innovations, like SaaS, until we can see the vast majority of firms around us accept them.					

36. We feel that we are an influential member of our industry peer group when it comes to SaaS adoption.					
37. We consider ourselves to be creative and original in our thinking and behavior towards SaaS adoption.					
38. We are aware that we are usually one of the last firms in our group to accept new innovations, SaaS being one of them.					
39. We are an inventive and innovative kind of an organization when it comes to SaaS adoption and use.					
40. We enjoy taking part in the leadership responsibilities of the industry we belong to, including pioneering SaaS adoption and use.					
41. We are reluctant about adopting new ways of doing things, like SaaS, until we see them working for organizations around us.					
42. We find it stimulating to be original in our thinking and behavior as an organization regarding SaaS adoption and use.					
43. We tend to feel that the old way of doing things is the best way. Why fix it if it is not broken?					
44. We are challenged by ambiguities and unsolved problems, and work extra-hard to solve them.					

45. We must see other organizations adopt and use new innovations, like SaaS, before we can consider them.					
46. We are receptive to new innovations, like SaaS, and take short decision cycles to adopt and use them.					
47. We are challenged by unanswered questions in our operations, and as a result, aggressively seek new innovations.					
48. We often find ourselves skeptical of new innovations, like SaaS, and often take long decision cycles to adopt and use them.					

Scoring:

Step 1: Add the scores for items 32, 34, 35, 38, 41, 43, 45, and 48.
Step 2: Add the scores for items 29, 30, 31, 33, 36, 37, 39, 40, 42, 44, 46, and 47.
Step 3: Complete the following formula: II = 42 + total score for Step 2 - total score for Step 1.

Scores above 80 are classified as Innovators.
Scores between 69 and 80 are classified as Early Adopters.
Scores between 57 and 68 are classified as Early Majority.
Scores between 46 and 56 are classified as Late Majority.
Scores below 46 are classified as Laggards/Traditionalists.

In general organizations which score above 68 and considered highly innovative, and organizations which score below 64 are considered low in innovativeness.

Section E: SaaS Adoption

In which of the following areas is your organization today using SaaS applications?

Software-as-a-Service adopted and in use	Currently Using	Plan to use in the next 24 months	No plans to use for now
49. Email If yes, which SaaS based Email?			
50. Team Meetings: If yes, which Team Meetings applications?			
51. Office Productivity: If yes, which Office Productivity Suite?			
52. Instant Messaging: If yes, which Instant Messaging platforms?			
53. Social Media: If yes, which Social Media platforms?			
54. Which of these workloads have you moved to the cloud?			
Finance and Accounting			
Human Resource Management			
Procurement			
Sales Force Automation			
Customer Relationship Management			
Payroll			
Project Management			
Application Development			
Other, please specify:			

55. What percentage of your organization's applications budget is allocated to SaaS-based outsourcing?

[ ] Less than 10 %
[ ] 10 – 20 %
[ ] 21 – 30%
[ ] 31 – 40 %
[ ] More than 40%

Appendix V: NSE Listed Companies

`SECURITIES
AGRICULTURAL
1. Eaagads Ltd
2. Kakuzi Plc
3. Kapchorua Tea Co. Ltd Ord
4. The Limuru Tea Co. Plc
5. Sasini Plc
6. Williamson Tea Kenya Ltd
AUTOMOBILES & ACCESSORIES
7. Car & General (K) Ltd Ord 5.00
BANKING
8. ABSA Bank Kenya Plc
9. BK Group Plc
10. Diamond Trust Bank Kenya Ltd
11. Equity Group Holdings Plc
12. HF Group Plc
13. I&M Holdings Plc
14. KCB Group Plc
15. National Bank of Kenya Ltd
16. NCBA Group Plc
17. Stanbic Holdings Plc
18. Standard Chartered Bank Kenya Ltd
19. The Co-operative Bank of Kenya Ltd
COMMERCIAL AND SERVICES
20. Deacons (East Africa) Plc
21. Eveready East Africa Ltd

22. Express Kenya Plc
23. Homeboyz Entertainment Plc
24. Kenya Airways Ltd
25. Longhorn Publishers Plc
26. Nairobi Business Ventures Ltd
27. Nation Media Group Plc
28. Sameer Africa Plc
29. Standard Group Plc
30. TPS Eastern Africa Ltd
31. Uchumi Supermarket Plc
32. WPP Scangroup Plc
CONSTRUCTION & ALLIED
33. ARM Cement Plc
34. Bamburi Cement Ltd
35. Crown Paints Kenya Plc
36. E.A.Cables Ltd
37. E.A.Portland Cement Co.
ENERGY & PETROLEUM
38. KenGen Co. Plc
39. Kenya Power & Lighting Co Plc
40. Total Kenya Ltd
41. Umeme Ltd
INSURANCE
42. Britam Holdings Plc
43. CIC Insurance Group Ltd
44. Jubilee Holdings Ltd
45. Kenya Re Insurance Corporation Ltd

46. Liberty Kenya Holdings Ltd
47. Sanlam Kenya Plc
INVESTMENT
48. Centum Investment Co Plc
49. Home Afrika Ltd
50. Kurwitu Ventures Ltd
51. Olympia Capital Holdings ltd
52. Trans-Century Plc
INVESTMENT SERVICES
53. Nairobi Securities Exchange Plc
MANUFACTURING & ALLIED
54. B.O.C Kenya Plc
55. British American Tobacco Kenya Plc
56. Carbacid Investments Ltd
57. East African Breweries Ltd
58. Flame Tree Group Holdings Ltd
59. Kenya Orchards Ltd
60. Mumias Sugar Co.
61. Unga Group Ltd
TELECOMMUNICATION
62. Safaricom
REAL ESTATE INVESTMENT TRUST
63. ILAM FAHARI I-REIT

Appendix VI: Respondent SaaS Adoption Psychographic Profiles Tabulation

Respondent ID	29. Our pe	30. We en	31. We se	32. We are	33. We fre	34. We are	35. We ran	36. We fee	37. We co	38. We are	39. We are	40. We en	41. We are	42. We fin	43. We ter	44. We are	45. We mu	46. We are	47. We are	48. We oft	Score	Psychographic Profile
118080450151	4	4	4	4	5	2	2	3	4	1	4	4	4	4	3	4	2	3	5	3	69	Early Adopter
118086837387	2	3	4	5	5	4	4	4	3	1	3	2	2	4	1	5	1	3	5	4	63	Early Majority
118081414004	4	4	5	3	4	2	2	5	4	3	4	4	2	3	2	2	2	4	4	2	71	Early Adopter
118084928938	3	4	4	2	4	2	2	4	4	2	4	4	2	4	2	4	2	4	4	2	73	Early Adopter
118087799925	5	5	5	1	5	1	1	5	5	1	5	5	1	5	1	5	1	5	5	1	94	Innovator
118087993979	3	4	4	2	4	2	2	4	4	2	4	4	2	4	4	4	2	4	4	2	71	Early Adopter
118085927244	5	2	5	5	4	2	2	4	2	3	2	3	5	4	5	5	4	5	5	4	58	Early Majority
118087075113	3	3	5	5	4	4	4	3	4	4	3	3	4	3	4	4	4	3	4	5	50	Late Majority
118086912920	5	4	5	2	5	1	1	5	5	1	4	5	1	4	1	5	1	4	4	1	88	Innovator
118085980549	4	4	4	4	4	3	2	4	4	2	4	4	2	4	2	4	3	4	3	2	69	Early Adopter
118086020567	4	4	5	1	5	1	1	5	5	2	5	5	1	5	2	4	1	5	4	1	88	Innovator
118084211751	4	4	4	2	5	2	1	3	3	2	3	3	2	4	2	4	2	4	4	2	72	Early Adopter
118083554945	4	4	4	3	4	3	4	4	4	2	4	4	3	3	4	4	4	4	4	3	63	Early Majority
118083518299	5	5	5	4	4	4	4	5	5	5	5	5	5	5	2	4	5	4	5	1	69	Early Adopter
118083313684	5	3	4	3	5	3	2	4	4	2	4	4	2	4	2	4	2	3	4	3	71	Early Adopter
118083310743	5	5	5	1	4	1	1	5	4	1	4	5	2	4	1	4	2	4	3	1	84	Innovator
118082328728	4	4	4	3	4	2	2	4	4	2	4	4	1	4	1	4	4	3	4	1	73	Early Adopter
118081779349	5	5	5	2	5	4	1	5	5	1	5	5	1	5	1	5	1	5	5	1	90	Innovators
118080977279	2	3	4	2	4	2	2	3	5	2	4	3	3	3	3	5	2	3	5	3	67	Early Majority
118080715966	4	4	4	2	4	1	1	4	4	1	4	5	1	4	1	2	1	4	4	1	80	Early Adopter
118080530769	4	5	5	3	5	2	2	5	5	1	5	5	1	5	1	5	1	4	4	2	86	Innovator
118080429658	4	4	4	2	4	1	2	3	4	2	3	3	2	4	1	4	2	4	4	4	71	Early Adopter
118074500590	4	4	4	1	4	1	1	4	4	1	4	4	1	4	1	4	1	4	4	1	82	Innovator
118077288597	5	5	4	3	4	2	4	4	4	2	4	4	2	4	2	4	2	4	5	2	74	Early Adopter
118079086186	3	4	4	4	4	2	2	4	4	3	4	4	2	4	2	3	2	4	4	2	69	Early Adopter
118078076920	4	4	5	4	4	2	2	3	3	2	4	3	2	3	2	4	4	2	4	2	65	Early Majority
118077896342	4	5	5	1	5	1	2	5	5	1	5	5	1	5	1	3	1	5	5	1	90	Innovator
118077842686	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	62	Early Majority
118076463219	4	4	4	4	4	4	4	4	4	2	3	3	4	4	2	4	2	4	4	4	62	Early Majority
118073827524	4	5	5	3	5	4	3	4	4	1	5	4	1	4	1	5	3	4	4	1	78	Early Adopter
118072783698	4	4	4	2	2	1	2	5	5	2	4	3	2	4	2	2	2	4	3	2	71	Early Adopter
118072740937	4	4	4	4	5	2	2	2	4	2	4	4	2	4	2	4	2	3	4	3	69	Early Adopter
118071790564	5	4	4	3	4	2	2	4	4	2	4	4	2	4	2	4	3	3	4	2	72	Early Adopter
118071774180	5	4	4	1	5	2	2	5	5	1	5	5	1	5	1	5	1	5	5	1	90	Innovator
118071249069	4	4	5	3	4	2	2	4	3	3	3	3	3	4	2	5	3	3	4	3	67	Early Majority
118071218346	4	5	5	4	4	2	2	3	3	2	4	5	2	4	2	2	3	3	4	3	68	Early Majority
118071131655	2	4	5	5	5	3	3	4	4	3	4	4	3	4	2	4	3	4	4	3	65	Early Majority
118070965222	3	4	3	4	4	4	3	4	4	4	3	4	4	2	3	4	4	4	3	4	54	Late Majority
118070399546	3	3	3	4	4	3	3	2	3	2	3	3	3	3	1	4	3	3	4	4	57	Early Majority
118070371505	5	5	5	2	5	1	1	5	5	1	5	5	1	5	1	5	1	5	5	1	93	Innovator
118069902220	3	3	4	4	3	4	4	3	3	3	4	5	4	4	3	3	3	4	4	4	56	Late Majority
118067682934	5	2	4	4	4	2	2	4	4	2	4	2	2	4	2	2	2	5	4	2	68	Early Majority
118067492358	3	3	4	2	5	1	1	3	3	3	3	3	3	3	2	4	4	3	3	3	63	Early Majority
118067436839	5	5	5	3	3	3	4	4	4	2	4	4	2	4	1	3	3	3	3	3	68	Early Majority
118065769011	2	4	4	4	4	2	4	4	4	2	3	4	4	4	5	4	4	4	3	4	57	Early Majority
118065434148	4	4	4	5	4	2	2	5	5	2	5	5	2	5	2	4	4	4	4	4	72	Early Adopter
118065232516	3	4	4	3	4	1	1	4	5	1	5	5	1	5	1	5	1	4	5	1	85	Innovator
118064312511	4	4	4	3	4	2	1	5	5	1	5	4	2	4	1	4	2	4	5	2	80	Early Adopter
118062734469	4	4	4	5	5	5	5	5	5	5	4	4	5	5	4	4	4	5	5	5	58	Early Majority
118061038751	4	5	4	2	4	2	1	4	5	1	5	4	2	4	2	5	1	3	4	3	79	Early Adopter
Mean	3.94	4.04	4.34	3.06	4.28	2.32	2.3	4.06	4.14	2.08	4.04	4.02	2.34	4.06	2.06	4.00	2.44	3.88	4.16	2.48	71.88	
Standard Deviation	0.8811	0.7473	0.5517	1.2395	0.6337	1.1214	1.1533	0.8102	0.7486	1.0741	0.7473	0.8364	1.2101	0.6756	1.1386	0.8718	1.1859	0.7386	0.6437	1.2368	10.7993	

Appendix VII: SaaS Adoption Facilitators and Inhibitors Response Tabulation

Respondent ID	Financial Adva	Financial Av	Solution Sc	Solution Sc	Top Manag	Top Manag	Rapid Depl	Rapid Depl	Industry Pr	Industry Pr	Connectivit	Connectivit	Limited Cus	Limited Cus	Security: TI	Security: Ei	Integration	Integration	Vendor Loc	Vendor Loc
118080450151	3	2	4	3	3	3	2	2	3	3	4	5	4	5	3	3	4	4	4	5
118086837387	4	3	5	5	5	5	4	4	4	3	4	4	3	4	4	5	4	4	5	5
118081414004	4	4	4	4	4	4	5	4	4	4	4	4	4	4	4	5	4	4	4	5
118084928938	4	4	4	4	4	4	5	4	5	4	4	4	4	4	4	4	4	4	4	5
118087799925	5	5	5	5	5	5	5	5	5	4	5	5	5	5	5	5	5	5	5	5
118087993979	3	3	5	5	5	5	4	3	4	4	4	4	4	5	4	5	4	5	4	5
118085927244	4	4	5	4	3	2	3	3	3	3	5	5	3	3	5	5	5	5	5	5
118087075113	3	2	3	3	5	4	3	2	2	2	4	4	4	5	4	4	4	5	4	5
118086912920	5	4	5	5	5	4	5	4	5	4	5	5	4	4	4	4	5	5	5	5
118085980549	4	4	4	4	3	2	3	2	3	3	4	5	4	4	4	5	4	5	4	5
118086020567	5	5	5	5	5	5	5	5	5	5	4	5	4	5	4	5	4	5	5	5
118084211751	4	3	3	2	3	3	3	3	4	4	4	4	3	4	4	5	4	5	4	5
118083554945	5	5	5	5	4	4	3	2	4	3	3	4	4	4	4	4	3	4	3	4
118083518299	5	4	5	4	5	5	4	4	4	4	4	4	4	4	3	3	4	5	4	5
118083313684	5	5	5	5	5	5	3	3	4	4	4	4	3	3	4	5	4	5	4	5
118083310743	5	5	5	5	5	5	4	3	4	4	5	5	4	4	4	4	5	5	5	5
118082328728	4	4	5	5	3	2	3	2	3	3	3	3	4	4	4	4	3	4	3	4
118081779349	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	5	4	5
118080977279	5	4	3	2	4	4	4	4	4	4	4	4	4	5	4	4	4	5	4	5
118080715966	5	4	5	5	5	4	4	4	4	4	3	3	4	4	4	4	3	4	3	4
118080530769	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	5	4	5	4	5
118080429658	3	2	4	4	3	2	3	2	3	2	4	4	4	4	4	4	4	5	4	5
118074500590	4	4	5	5	5	5	5	5	5	4	4	4	4	5	4	4	4	5	4	5
118077288597	5	4	5	5	5	5	4	4	4	4	4	4	4	4	3	4	4	5	4	5
118079086186	4	4	5	5	4	3	4	4	4	3	3	3	4	4	4	4	3	4	3	4
118078076920	5	5	5	5	5	4	5	5	5	4	4	4	4	4	4	4	4	5	4	5
118077896342	5	5	5	5	4	4	3	2	4	4	4	4	3	4	4	5	4	5	4	5
118077842686	3	3	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
118076463219	5	5	3	5	3	3	3	3	3	3	4	4	4	4	4	4	4	5	4	5
118073827524	5	5	5	5	5	4	4	4	4	4	4	4	5	4	5	4	4	4	5	4
118072783698	5	5	5	5	5	4	5	5	5	4	5	5	5	5	5	5	5	5	5	5
118072740937	5	5	5	4	4	3	4	4	4	4	5	5	3	3	4	4	5	5	5	5
118071790564	3	3	3	3	3	2	3	2	3	3	4	4	3	4	4	5	4	5	4	5
118071774180	5	5	5	5	5	5	5	5	5	5	4	4	4	5	5	5	4	5	4	5
118071249069	3	3	3	3	3	3	3	2	3	3	4	4	3	4	4	5	4	5	4	5
118071218346	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	5	4	5	4	5
118071131655	4	4	3	2	3	2	3	5	3	3	4	4	4	4	4	5	4	5	4	5
118070965222	4	4	5	5	4	4	5	4	5	4	4	4	4	4	4	5	4	5	4	5
118070399546	4	4	4	4	3	3	3	2	3	3	4	4	4	4	3	4	4	5	4	5
118070371505	4	3	5	5	5	5	4	4	4	4	5	5	4	4	4	4	5	5	5	5
118069902220	5	4	3	2	3	2	3	3	3	3	4	4	4	4	3	4	4	5	4	4
118067682934	5	4	5	5	4	4	4	4	4	4	4	4	4	4	5	5	4	5	4	4
118067492358	5	5	5	5	3	3	4	4	3	2	5	5	3	3	5	5	5	5	5	5
118067436839	5	5	5	5	5	5	3	3	3	3	5	5	5	5	5	5	4	5	5	5
118065769011	4	4	4	4	4	4	4	4	5	4	4	4	3	3	4	4	4	5	4	4
118065434148	3	3	3	2	2	2	2	2	3	3	4	5	4	4	3	4	4	5	4	5
118065232516	5	5	5	5	5	5	4	4	4	4	4	4	5	5	4	4	4	5	4	5
118064312511	5	5	5	5	4	4	5	5	5	4	5	5	4	4	4	4	5	5	5	5
118062734469	4	4	3	3	3	3	3	2	3	3	4	5	4	4	4	4	4	5	4	5
118061038751	5	5	5	5	4	3	4	4	4	3	4	4	4	4	4	4	4	5	4	4
Strongly Agree	52%	38%	62%	58%	42%	30%	26%	20%	26%	8%	22%	34%	10%	26%	16%	44%	20%	84%	26%	84%
Agree	32%	40%	18%	22%	28%	34%	36%	40%	42%	52%	70%	60%	70%	64%	72%	52%	72%	16%	66%	16%
Neutral	16%	16%	20%	10%	28%	20%	34%	16%	30%	34%	8%	6%	20%	10%	12%	4%	8%	0%	8%	0%
Disagree	0%	6%	0%	10%	2%	16%	4%	24%	2%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Strongly Disagree	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Mean	4.36	4.10	4.42	4.28	4.10	3.78	3.84	3.56	3.92	3.62	4.14	4.28	3.90	4.16	4.04	4.40	4.12	4.84	4.18	4.84
Standard Deviation	0.7419	0.8775	0.8022	1.0008	0.8775	1.0448	0.8570	1.0613	0.7960	0.7181	0.5295	0.5671	0.5385	0.5783	0.5276	0.5657	0.5154	0.3666	0.5546	0.3666

Appendix VIII: Spearman's Rank Correlation Coefficients Tabulation

	FA	SS	TMS	RD	IP	CC	LC	SC	IC	VLI	PP	SA
FA	1.0000 50											
SS	0.4765* 50 0.0005	1.0000 50										
TMS	0.4036* 50 0.0037	0.6565* 50 0.0000	1.0000 50									
RD	0.3411* 50 0.0153	0.5243* 50 0.0001	0.6339* 50 0.0000	1.0000 50								
IP	0.3616* 50 0.0099	0.5358* 50 0.0001	0.6310* 50 0.0000	0.8796* 50 0.0000	1.0000 50							
CC	-0.1573 50 0.2754	-0.2296 50 0.1086	-0.2010 50 0.1616	-0.2757 50 0.0526	-0.1688 50 0.2413	1.0000 50						
LC	-0.1598 50 0.2677	-0.1729 50 0.2299	-0.3698* 50 0.0082	-0.3234* 50 0.0220	-0.2172 50 0.1297	0.1076 50 0.4571	1.0000 50					
SC	-0.1664 50 0.2480	-0.3598* 50 0.0103	-0.2280 50 0.1113	-0.3362* 50 0.0170	-0.2459 50 0.0852	0.4337* 50 0.0017	0.1355 50 0.3483	1.0000 50				
IC	-0.1232 50 0.3941	-0.2012 50 0.1612	-0.1626 50 0.2591	-0.3263* 50 0.0208	-0.2227 50 0.1201	0.9609* 50 0.0000	0.0307 50 0.8323	0.3688* 50 0.0084	1.0000 50			
VLI	-0.1612 50 0.2634	-0.2847* 50 0.0450	-0.2746 50 0.0536	-0.3232* 50 0.0220	-0.2178 50 0.1287	0.9281* 50 0.0000	0.0476 50 0.7428	0.4110* 50 0.0030	0.8930* 50 0.0000	1.0000 50		
PP	0.2737 50 0.0544	0.3854* 50 0.0057	0.4022* 50 0.0038	0.3643* 50 0.0093	0.4233* 50 0.0022	-0.0907 50 0.5310	-0.1734 50 0.2286	-0.0427 50 0.7687	-0.1136 50 0.4321	-0.0998 50 0.4906	1.0000 50	
SA	0.3909* 50 0.0050	0.5503* 50 0.0000	0.6244* 50 0.0000	0.9175* 50 0.0000	0.9379* 50 0.0000	-0.3265* 50 0.0206	-0.2881* 50 0.0424	-0.2809* 50 0.0482	-0.3757* 50 0.0072	-0.3333* 50 0.0180	0.4244* 50 0.0021	1.0000 50