



ADDIS ABABA UNIVERSITY
COLLEGE OF NATURAL AND COMPUTATIONAL SCIENCES
SCHOOL OF INFORMATION SCIENCE

**ASSESSING CLOUD ERP ADOPTION IN ETHIOPIAN SHIPPING
AND LOGISTICS SERVICES ENTERPRISE**

By

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JUNE, 2021
ADDIS ABABA, ETHIOPIA



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AND LOGISTICS SERVICES ENTERPRISE

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Declaration

This thesis has not previously been accepted for any degree and is not being concurrently submitted in candidature for any degree in any university.

I declare that this thesis entitled “*Assessing Cloud ERP Adoption in Ethiopian Shipping and Logistics Services Enterprise*” is a result of my own investigation, except where otherwise stated. I have undertaken the study independently with the guidance and support of my research advisor. Other sources are acknowledged by citations giving explicit references. A list of references is appended.

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Abstract

The trend these days is towards Enterprise Resource Planning (ERP) systems as organizations are continuously searching for ways to operate more efficiently in order to remain competitive. ERPs are integrated information systems that transform organizations' internal processes, provide collaboration with partners, external applications and information systems. Extant literature reveal that organizations have interest in transition from an on premise method to the new cloud-based ERP systems because the on premise solutions have many issues and challenges whereas cloud-based ERP systems facilitate extra benefits. Using the technology-organization-environment, diffusion of innovation, and the model of innovation resistance frameworks as lens, this research aims at identifying factors contributing for the actual adoption of cloud ERP in Ethiopian context.

A quantitative approach is adopted and survey was conducted using self-administered online questionnaire using Google Forms to gather data from employees of Ethiopian Shipping and Logistics Services Enterprise. Out of 295 questionnaires distributed, 152 valid questionnaires were collected and considered for the data analysis. The proposed model was tested using a partial least square with the help of the Smart PLS 2.0 software. The proposed model explained 58.5% of variance in cloud ERP adoption factors. The empirical analysis result of the study indicated that Relative advantage, Trust, Information technology skill and External pressure had significant influence ($P < 0.05$) on the adoption of cloud ERP in Ethiopia whereas organizational culture, trialability and observability had no significant impact ($P > 0.05$) on the adoption of cloud ERP service. The research was conducted in the single case organization, Ethiopian Shipping and Logistics Services Enterprise, which may limit the generalizability of the findings. The study provides a comprehensive understanding of the factors which affect the adoption of cloud-based ERP technology in Ethiopia which may help the Ethiopian Shipping and Logistics Enterprise to understand its workforces' intention to adopt the cloud ERP and make strategy accordingly to realize potential benefits of the system. This research has contributed to theory, in that considering the shortage of literature that currently exists in general about cloud technology adoption, it is an addition to enrich cloud ERP service related literatures by exploring different factors which can affect adoption process, and also help as springboard for other researchers for the future work on the area. The study's findings also provide guidance for companies that have interest to adopt cloud-based ERP in the future. Future research works could examine multiple cloud ERP implementing organizations with the research model that incorporating additional constructs in users' cloud ERP adoption.

Keywords: *Enterprise Resource Planning (ERP), Cloud ERP, Critical Success Factors, technology-organization-environment, Adoption*

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List of Acronyms

| | |
|-------|--|
| ASP | Application Service Provision |
| BSP | Business Service Provision |
| CRM | Customer Relationship Management |
| CSF | Critical Success Factors |
| DOI | Diffusion of Innovation |
| EPM | Enterprise Performance Management |
| ERP | Enterprise Resource Planning |
| ES | Enterprise System |
| ESLSE | Ethiopian Shipping and Logistics services Enterprise |
| EXP | External Pressure |
| HCM | Human Capital Management |
| IaaS | Infrastructure as a Service |
| ICT | Information Communication Technology |
| IDT | Innovation Diffusion Theory |
| IS | Information Systems |
| IT | Information Technology |
| MIR | Model of Innovation Resistance |
| MRP | Materials Requirements Planning |
| MRPII | Manufacturing Resources Planning II |
| NIST | National Institute of Standard and Technology |
| OBS | Observability |

| | |
|-------|--|
| ORC | Organizational Culture |
| PaaS | Platform as a Service |
| PLS | Partial Least Squares |
| RAD | Relative Advantage |
| SaaS | Software as a Service |
| SCM | Supply Chain Management |
| SCT | Social Cognitive Theory |
| SEM | Structural Equation Modeling |
| SLA | Service level Agreement |
| TAM | Technology Acceptance Model |
| TOE | Technology, Organization and Environment |
| TPB | Theory of Planned Behavior |
| TRA | Theory of Reasoned Action |
| TRI | Trialability |
| TRU | Trust |
| UTAUT | Unified Theory of Acceptance and Use of Technology |

CHAPTER ONE

INTRODUCTION

This chapter introduces the background of the research, motivation of the research, statement of the problem, research questions and objectives, scope of the research, and significance of the study.

1.1. Background

For the survival and growth of many firms in today's businesses environment, creative use of information technology (IT) and Information systems (IS) is essential. IT and IS together provide new opportunities to redesign their business processes and work practices, while enabling organizational change (Aydinera et al., 2019). Progress in IT in the past decades and, especially, the universal extension and implementation of business software combined with propagation of network technologies (Internet) in recent years have enabled companies to support moderate advantages across traditional borders, including geographical borders (Arasteh et al., 2010).

ERP (Enterprise Resource Planning) systems are defined as complete and packaged software solutions that seek to integrate processes and functions into a holistic view of business from a single IT and information architecture (Costa et al., 2016; Klaus et al., 2000). ERP is an integrated system for automating the flow of materials, information and financial resources using shared information flow by combining business processes (Acar et al., 2017; Junior et al., 2019). ERP systems are designed to provide, at least in theory, seamless integration of processes across functional areas with improved workflow, standardization of various business practices, and access to real-time up-to-date data (Rajnoha et al., 2014).

ERP systems have been popular IT applications since the 1990's (Salim, 2013). Before ERP systems become the standard in many organizations, companies typically processed data and information using several dispersed information systems and packages (Haddaraa & Constantinib, 2017). This demanded development of a custom code which is a tedious process.

Companies used to have departmentalized systems, instead of corporate-wide enterprise systems, which cannot share information easily within the organization. This has resulted in data discrepancies which can cause time taking and inaccurate reports for decisions. This in turn affects organization level enterprise performance due to the absence of integrated information systems (Demeke, 2018).

ERP systems have steadily evolved throughout several decades and these days virtually cover business processes and routine transaction for the whole organization. Cloud-ERP is emerging as the new trend in the ERP market as opposed to on premise ERP systems; this is due to cloud-ERP having the advantages of economies of scale gained from shared resources (Demi & Haddara, 2018). The emergence of cloud computing provided opportunities for creating new business for organizations through technology that provides collaboration and communication in an enhanced way by delivering cloud-based ERP. Furthermore, cloud computing provides up-to-date IT resources and a pay-per-use transaction model instead of upfront investments.

The fundamental technology that cloud-based systems are developed on is cloud computing. Cloud computing is a model for enabling flexible, on-demand network access to a shared pool of configurable computing resources that are delivered and released with minimal management effort from the client side, and with minimal need for client and service-provider interaction (Demi & Haddara, 2018). One advantage of cloud computing is the reduction of computing costs by sharing a large pool of resources, which also could increase reliability, availability and flexibility. It is estimated that the cost of using cloud ERP was 15% lower than the traditional ERP and that implementation time was decreased by 50% to 70% (AlBar and Hoque, 2017). As a user of the cloud-based ERP system, the resources are not be shown from where or how they are provided to the user, as the system's vendor takes responsibility for the IT resources provision (Demi & Haddara, 2018).

Enterprises nowadays are making different investments and the expected Return on Investment (RoI) can be in the form of reducing cost, maximize profits and helping in decision support. One of the investment areas is ERP systems (Elmonem et al., 2016). In a research conducted by Hitt et al. (2002), it was found that firms that adopted ERP systems exhibit better performance in terms of user productivity and firm's performance; sales per employee, profit margins, return on assets, inventory turnover, asset utilization, payable and receivables accounts turnover, etc.

Furthermore, Cloud computing reduces the cost of entry for small companies and businesses in developing countries. By adopting cloud Solutions, small companies can use expensive business analytic software, which requires a high level of IT infrastructure to enhance their business at relatively low cost, while this kind of application was available only for large companies or enterprises previously (Priyadarshinee et al.,2017; Hitt et al., 2002).

Although ERP systems are being used widely all around the world, they bring along many problems as well as benefits. The success of an ERP system is partially dependent on the extent of usage by end-users within the firm (Boudreau & Robey, 1999). The more the usage by the intended users at different levels in the company, the greater the likelihood that such a firm will gain competitive advantage which is one of the key goals of deploying an ERP system (Nwankpa & Roumani, 2014).

Based on the literature evidence from (Ahn & Ahn, 2020; AlBar & Hoque, 2017), it is learned that factors affecting intention to or actual adoption of cloud based ERP can vary from country to country. Hence, this research aims to improve the understanding by using diffusion of innovation, the model of innovation resistance; and Technology, Organization and Environment related constructs that inhibiting or fostering the adoption of cloud based ERP in local organizations context.

1.2. Motivation of the Study

Technology Adoption is a sociological model that describes the adoption or acceptance of a new product or innovation, according to the demographic and psychological characteristics of defined adopter groups¹. It is generally accepted that two different groups of theories are required in order to explain technology adoption at individual level and at organization level. For individuals, behavioral theories including technology acceptance model (TAM), theory of planned behavior (TPB), unified theory of acceptance and use of technology (UTAUT) are frequently used to predict intention and actual behavior. For organizations, diffusion of innovation (DOI) model and technology-organization-environment (TOE) framework are commonly applied for predicting adoption. While this divide appears to be reasonable, the

¹ https://en.wikipedia.org/wiki/Technology_adoption_life_cycle

process of investigating an organization is, inevitably, done through collecting opinions of the people in the organization (Jerry, 2020).

Though Cloud Computing has a number of advantages for enterprises, there are also a number of constraints for adopting it. Service quality, potential outages, loss of control over IT resources, and possible data lock-in in the absence of clearly defined standards are some of the concerns on which enterprises face. However, scholars have indicated that the perceived benefits appear to outweigh these inherent constraints, and appear to compel firms to look towards cloud for their IT resource requirements (Woldegebreal, 2018). Furthermore the adoption and use of ERPs can reshape an organization's culture, structure and processes, as well as change the distributions of power, autonomy, rights and obligations of people inside the organization (Peng & Gala, 2014).

Extant literatures show that the adoption of cloud ERP in developing countries like Ethiopia is still in its infancy. Ahn & Ahn (2020) also studied the factors affecting to cloud ERP adoption intention based on TOE, DOI and MIR frameworks in Korea and they have suggested related future studies because each countries environment is different, the same study can be repeated in another places. It is also known as little study has been conducted on the developing nation's context regarding cloud ERP adoption trends and determinant factors for the implementation. Majority for the earlier literatures focused on the on premise ERP implementation deliberate on critical success factors, deployment challenge and opportunities (AlBar & Hoque, 2017).

This research tries to explore factors that affect Cloud ERP adoption in Ethiopia, a developing nation where there is limitation of financial resource, skilled man power, Information Technology literacy, limited access to the Internet and poor ICT infrastructure. Currently, cloud-based ERP adoption shows trend of expansion in Ethiopia, among government and private organizations. Ethiopian Shipping and Logistics services Enterprise (ESLSE) is one of the government owned public enterprise that recently implemented cloud-based ERP to support its business processes and manage its operational activities. ESLSE has passed through a number of processes to implement Cloud ERP from product selection to project management and bringing the system to live for use. ERP adoption is strategic decision that demands adequate resources and due attention from top management of the organization.

1.3. Statement of the Problem

Organizations in many countries, especially the developed ones, have benefited a lot from ERP systems by highly adopting these systems since early 1990s (Otieno, 2010). Developing countries are adopting ERP systems these days. Despite the ERP systems immense short and long term benefits, developing countries like Ethiopia have not yet adopted and benefited much from such integrative information solutions which are usually suited for organizations with large size businesses or services (Demeke, 2014).

The global cloud ERP market size reached USD 44.83 Billion in 2020 and is expected to register a compounded annual growth rate of 15.6% during the forecast periods 2020 till 2028. Increasing need to streamline business processes is one of the key factors expected to drive global cloud ERP market revenue growth over the forecast period. Businesses globally are focusing on optimizing business processes in order to increase operating efficiency while maintaining control of operating expenses. Businesses are seeking a streamlined approach to handling various business processes, including accounting and finance, marketing, sales, purchasing, and operations management. Cloud ERP provides companies with the agility and optimization they need to optimize their operations and maximize performance. Cloud ERP is among the most important tools a company could use to stay ahead of the competition. Increasing demand for real-time analytics to improve operational efficiency is expected to further propel growth of the global cloud ERP market revenue going ahead (Emergent Research, 2021). Cloud ERP system has enjoyed rapid growth around the world. However, the adoption of cloud ERP in developing countries is still in its infancy, and little research has been done to investigate this issue (AlBar and Hoque, 2017).

Salum & Rozan (2015) have studied the barriers and drivers involved in the cloud ERP adoption decision by Small and medium enterprises (SMEs). The findings indicate that technological, economic and organizational drivers are the critical considerations in cloud ERP adoption decisions by SMEs. Environmental, innovation, human-related and vendor-related issues are the next groups of important drivers.

There are also some local researches on business organization's ERP adoption issues from different perspectives. Demeke (2014), for instance, has identified factors such as project

planning, top management support, project management and leadership, capability of consultants, change management and communication, organizational readiness and overall knowledge transfer are among the factors found to be critical for SAP ERP system implementation in the Ethiopian Airlines. Maschal (2017) has found that user training and education, system provider and/or consultant support, technological infrastructure, change management & effective communication have significant relation with the success of ERP systems implementation and do have high impact on ERP implementation success. System quality, technical support, management support and social capital are found to be significant antecedents that enhanced the users' satisfaction of ERP System (Berhe, 2018).

A study by Woldegebreal (2018) proposed a conceptual cloud adoption model grounded by Technology, Organization and Environment (TOE) and Diffusion of Innovation (DOI) frameworks and the study showed as the adoption of cloud computing by Ethiopian firms is in infancy stage. Many of those firms faced decision challenge on identifying an appropriate cloud deployment model that best fits to their business need while considering implementing cloud solution. Gashaw (2017) also found awareness, willingness, top management support, communication and training as import factors for ERP project accomplishment.

Specific to cloud computing, Abere (2014) has proposed Hybrid Cloud Computing model for Ethiopian Banking Industry. His research result shows that the proposed cloud computing service framework can have a capabilities for reducing IT investment cost and management complexity, efficient IT utilization for delivering banking services and improve collaboration among partners. Another study by Bekele (2014) focuses on exploring factors (technological, organizational, and environmental) that affect the decision to adopt cloud computing in Ethiopian banks and identified complexity, compatibility, employee skills, risk of failure and external factors: customer demand, external pressure, cost, and consistency of cloud computing have a positive influence on decision to adopt cloud computing. However, the internal factors: organizational infrastructure, firm size, relative advantage and the external factors: competition, government rules, regulations, proclamations, security, cloud vendor's support, network bandwidth, and availability of cloud services were found not to have an influence on the adoption of cloud computing technologies in Ethiopian banking sector. As per the knowledge of the researcher and reviews of related literature, little study has been conducted to investigate

factors affecting cloud-ERP adoption in Ethiopia. So the aim of this study is towards identifying the factors significantly affecting the adoption of cloud based ERP in Ethiopian Shipping and Logistics Services Enterprise.

1.4. Research Questions

Dictated by the research gap presented in section 1.3 above, this study examined the factors that influence the adoption of cloud ERP in Ethiopia. Accordingly, the proposed research tries to address the following question:

- What are the key factors that affect cloud ERP adoption in Ethiopian Shipping and Logistics Services Enterprise?
- What are the technology adoption models and constructs considered in Cloud ERP adoption?
- To what extent each constructs affect cloud ERP adoption in Ethiopian Shipping and Logistics Services Enterprise?

1.5. Objective of the Study

1.5.1. General Objective

The general objective of this research is to identify factors that are significantly affecting Cloud ERP adoption in Ethiopian Shipping and logistics services enterprise.

1.5.2. Specific Objectives

The following specific objectives are set to address the research objective of the study:

- To review literature so as to understand about ERP systems in general and Cloud-based ERP adoption factors in particular.
- To formulate research model based on diffusion of innovation (DOI), the model of innovation resistance (MIR) and Technology, Organization and Environment (TOE)-frameworks.
- To formulate hypothesis based on previous studies which reflect relation to Cloud-based ERP adoptions.

- To conduct survey (questionnaire) from selected system users in order to verify the hypothesis formulated.
- To analyze results based on the collected data and identify factors affecting cloud ERP adoption.

1.6. Scope and limitation of the Study

The scope of this research is bound to conducting a study to investigate factors affecting Cloud ERP adoption the case of Oracle Cloud-based ERP implementation project at Ethiopian Shipping and Logistics services Enterprises. The focus of the study is around the five main ERP modules implemented in the company: Oracle ERP- Financial Cloud, Oracle SCM, Oracle order Management, Oracle HCM Cloud, and Oracle EPM Cloud. This study is limited to identifying factors that influence the adoption of cloud ERP System. This study has been conducted based on primary data collected from system users through questionnaire. The study data was collected from employees of the enterprise located at different branches from April 1 to April 15, 2021. The collected data is original and unique data, which is directly collected by the researcher from a source according to the study requirements and research questions at hand to be answered.

1.7. Significance of the Study

This research will systematically identify factors that affect Cloud ERP adoption in ESLSE that will help the management of the enterprise to address determinant areas those needs courtesy to make the system sustainable and efficiently utilize to improve performance of the organization. The findings from the study offer practical guidelines to the successful adoption of cloud ERP in Ethiopia and benefit all business organizations that already implemented cloud ERP as well as those interested to adopt Cloud ERP services. Successful implementation of ERP project by itself does not give assurance of sustainability and proper utilization of Technology to increase operational efficiency. However, it requires full acceptance by the organization. Hence, this research helps potential cloud adopters to evaluate their internal organization and environment to decide on their readiness. ERP vendors need to understand local context of Cloud ERP adoption factors and address the requirements of their customers and align their marketing

strategy accordingly. Government and regulatory bodies can get an insight on the importance of policy issues pertaining to Cloud ERP adoption in government and private organization in the country. The adoption of cloud ERP in developing countries such as Ethiopia is still in its infancy, and little research has been done to investigate this issue (AlBar and Hoque, 2017). This study formulate research module using technology-organization-environment (TOE), diffusion of innovation(DOI) and the model of innovation resistance (MIR) characteristics to investigate the individual, environmental, technological and organizational factors affecting the adoption of cloud ERP adoption in Ethiopia. The findings will provide new insights on cloud ERP adoption and will help both academia and practitioners increase understanding for future research and implementation.

1.8. Organization of the Thesis

This research is organized in five chapters. Chapter one introduces the importance of information technology and ERP systems in business organizations, the operational definitions of Enterprise planning systems, the evolution of ERP and the emergence of cloud computing, the advantages of cloud-based ERP, rational of business to invest in cloud ERP and challenge and benefits of cloud ERP adoption are discussed. This chapter also includes a statement of the problem, research questions, and research objectives, significance of the study and scope of the study. Chapter two presents the review of literature in business value of IT and over views ERP systems, cloud computing Technology, critical success factors of ERP adoption, types of cloud computing service categories, drivers and barriers to Cloud-based ERP adoption, Stakeholders in Cloud Computing and finally discusses and explore some of the technology adoption Models. Chapter three describes the research design and methodology used. Thus, the chapter includes research design, source of data, sampling technique, research population, data collection methods, validity, reliability, and Statistical data analysis. Chapter four presents a summary of the collected data that is analyzed, interpreted, described, and discussed based on the significance of the key findings in light of what was already known about the research problem. Chapter five finally that provides concluding remarks of the research and recommendations for further investigation as per the findings of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1. Overview

The main purpose of the literature review is to understand the notable work done previously in the area of cloud computing adoption and its usability challenges in the world, accordingly this chapter presents a conventional definition of ERP systems, On Premise and Cloud-based ERP systems, business value of IT, Stakeholders involved in cloud computing chain, cloud computing service models , critical success factors of ERP implementation , drivers and barriers to cloud-based ERP adoption, and Cloud computing Technology. Literature on technology adoption models, including the Oracle's True Cloud implementation methodology will also be discussed.

2.2. Business Value of Information Technology

Since the beginning of organizations, methods were researched to improve business processes. This is when computer systems and databases were introduced to the business world. Creating an information system helps the organization to maintain its data and use its processes. At first, it was a great idea to have a computer performs a process much faster than a human can do. It was also unbelievable to store millions of papers into a drive that is smaller than a human's head. However, when businesses started growing more, the need for computer systems has increased (Almgren & Bach, 2014). These days' firms often adopt information systems (IS) to upgrade or improve their business performance and competitiveness (Ruivo et al., 2012).

In particular, as the business environment has been increasingly competitive and globalized, firms are being required to improve their strategic and technological agility and reduce the complexities of their business and IT operations to sustain their competitive advantage in a rapidly changing environment (Son & Lee, 2011). Businesses fast-growing requirements include web access and mobile sales, sourcing, recruitment and contract management, data mobility has become vital for organizations. The ability to utilize the organization's applications and data from different locations and by using different devices is a technology trend that cannot be avoided in the modern Internet era (Majed & Ahmad, 2018).

Business strategy can be characterized as having two key objectives, operational efficiencies, which attempts to reduce costs and increase productivity and speed, and strategic positioning, which aims to extend the existing market by providing customer access and better market practices. Such objectives have been used to link firms' strategic intents for IT (Tallon et al., 2019). In operations-focused firms, IT is primarily implemented to improve the efficiency and effectiveness of the organizational processes; meanwhile in market-focused firms, IT is used to enhance their strategic positioning. Firms that favor strategic positioning over operational efficiencies should achieve superior levels of firm performance. Previous event studies have found that the market reacts more positively to announcements of innovative and transformative investments than non-innovative ones (Son & Lee, 2011).

As the role of Information Technology (IT) has steadily increased and being more center in companies and business so has also the budget for IT investment come to grow. Companies' spend more and more on IT and IT support and in many organizations the Enterprise Resource planning systems consists of the largest part of the IT cost (Johansson et al., 2016). Organizations are also looking forward for replacing their existing IT systems with more adaptable enterprise systems operable in digital business environment (Ahmed et al., 2020). Therefore, cloud ERP systems are exponentially growing, which shows its possible future significance where businesses choose to invest in (Usman et al., 2017).

2.3. ERP System

Enterprise resource planning (ERP) systems include a set of integrated modules comprising functional areas such as finance and cost accounting, sales and distribution, materials management, human resources, production planning and manufacturing, customer management, and supply chain. An ERP system helps in organizing, defining, and standardizing the business processes essential to effectively plan and control an organization so that the organization "can use its internal knowledge to seek external advantage" (Tongsuksai et al.,2019).

Enterprise Resource Planning (ERP) systems sought to address the existence of fragmented legacy systems in organizations by having a system that integrates all business functions into a single system, hence "creating value and reducing costs by making the right information available to the right people at the right time to help them make good decisions in managing

resources productively and proactively. Over the years, ERP systems have continued to evolve due to changing technology and business requirements. The systems evolved from Inventory Control Systems of the 1960s to Materials Requirements Planning (MRP), which became Manufacturing Resources Planning (MRPII) in the later years. In yet another evolution of ERP systems, recent advances in Cloud computing technology have resulted in the development of Cloud ERP systems (Kinuthia, 2015). Intelligent ERP is emerging and becoming highly essential to organizations' future, and to enable smart organization. Applying cognitive properties such as artificial intelligence, machine learning, advance analytics and deep learning would extract value from data and change the decision making approach (Majed & Ahmad, 2018).

The emergence of cloud computing in general and SaaS in particular has, therefore, disrupted the traditional market of enterprise systems (e.g., ERP, Customer Relation Management/CRM, Supply Chain Management/SCM, etc.) Leading IT vendors are heavily investing to change their traditional business models through architectural development to provide systems like ERP using cloud (Ahmed et al., 2020).

2.3.1. On Premise ERP

It is a traditional ERP system that hosts an organization's functional requirements and is required to access the organization's information and communication technology (ICT) infrastructure. These traditional systems, however, become rather inconvenient for acquiring information when accessed remotely; in this case, they show less reliability and flexibility because the information system is not in real-time (Tongsuksai et al., 2019).

Traditional ERP systems have often been considered too clunky, expensive and complex for most organizations, which require on premise deployment implying that ERP resources (data, module applications, and database servers) are hosted internally and maintained by client organizations (Ahmed et al.,2020).

2.3.2. Cloud-Based ERP

Software as a Service (SaaS) is also termed as software on demand is increasingly a popular tool for implementing various business applications. Although on-demand software application delivery models have been in existence since the 1990s, and offered in many forms including

application service provision (ASP) or business service provision (BSP), the SaaS model of software delivery is fast becoming a serious option for enterprises of all sizes and types. The Application Service Provider (ASP) model, popular in the late 1990s, hosts a commercial software application in its secure centrally located servers and licenses the application to multiple customers. With no control over the features and development of commercial applications and no domain knowledge to effectively customize and support the applications to individual customer needs, the cost and innovation benefits of the ASP model were very limited. Compared to the ASP model, the SaaS model has a shorter implementation time, higher intuitive usability, multi-tenant scalability, easy to use web-based programs, and with regular enhancements and upgrades, is considered cost effective (Seethamraju,2014).

2.4. Cloud Computing Technology

Information technologies and systems typically mature and undergo commoditization as new stream of technologies emerges. The concept of cloud computing is said to be relatively new and an emerging paradigm. Kim et al. (2009) on the other hand, argued that cloud computing is not an entirely new concept, noting that it is similar to network computing and grid computing concept of the 1990s. Following this, a number of researchers conjectured that the existence of cloud computing is due to the convergence of earlier technologies such as virtualization, cluster computing, grid computing, broadband marketing and large scale data centers centralized at a low cost locations (Salleh et al.,2012).

Cloud computing is an unconventional IT model to host and share both software and hardware assets over the Internet. It approves businesses to practice a group of IT resources and applications as services essentially through the web, without substantially holding these computing assets within themselves (Priyadarshinee et al., 2017). It can be also referred as service applications delivered on the Internet, and the software and hardware in the center of data which offer those services (Tongsuksai et al., 2019). Ultimately, with the flexibility and capability of Cloud Computing, it enabled Enterprise Systems to be delivered via the Internet and accessible to wide variety of users at a much lower costs (Salleh et al., 2012).

Cloud computing is an emerging new computing model for the organization to support business process solution and the result of a successful information system. With the enormous growth of

users, services, business contents and resources, information systems are facing the challenges of optimizing resource allocations, dealing with energetic concurrency demand, handling rapid storage growth requirement and cost monitoring (Rahimah et al., 2016). With the rapid development of processing and storage technologies and the success of the Internet, computing resources have become cheaper, more powerful and more available than ever before. This technological trend has enabled the realization of a new computing model called Cloud Computing, in which resources are provided as general utilities that can be leased and released by users through the Internet in an on-demand fashion (Avram, 2014).

The Internet is a network of networks, which provides software/hardware infrastructure to establish and maintain connectivity of the computers around the world, while Cloud Computing is a novel technology that delivers many types of resources over the Internet. Therefore, Cloud Computing could be identified as a technology that uses the Internet as the communication medium to deliver its services (Priyadarshinee et al., 2017).

In summary a revolutionary innovation of cloud computing has redefined the way information technologies have been “invented, developed, deployed, scaled, updated, maintained and paid for”. Analyzing the most widely adopted definition provided by the National Institute of Standard and Technology (NIST), the five essential characteristics of cloud computing are: (i) on-demand self- service access (ii) virtualized, shared, and managed IT resources that are (iii) scalable on-demand, (iv) available over a network, and (v) priced on a pay-per-use basis. However, decisions to insource computational resources or locate those outside the organization will have a major shift in organizational roles in controlling and maintaining those resources, relationship management with the service provider as well as other users on the same service platform, therefore, adoption decision is fraught with challenges (Ahmed et al., 2020).

2.5. Stakeholders in Cloud Computing

There are different stakeholders of cloud computing such as consumers, providers, enablers and regulators.

2.5.1. Consumers

In a cloud computing environment, the consumers are effectively subscribers, who now only purchase the use of the system from the providers on an operational expense basis. Corporate users of cloud computing have an active role to play in ensuring that cloud ends up delivering on its promise of revolutionizing corporate computing, by liaising with industry groups as well as national and international regulators. Effective use of cloud computing's potential will reduce the stress on the IT departments as they spend less time maintaining systems and more in developing innovative applications for the organization (Marston et al., 2011).

2.5.2. Providers

Cloud computing service providers own and operate cloud computing systems to deliver service to third parties. The providers will perform the maintenance and the upgrades on the system which consumers were in charge of when they owned the systems. They will also be responsible for maintaining the software used on the cloud, along with the pricing on the cloud services. Most cloud computing provider companies today have been large scale datacenters and software infrastructure. The different providers that we witness today have developed competencies around the different components (software, platform, and infrastructure) that make up the cloud computing service (Marston et al., 2011).

2.5.3. Enablers

The term 'enablers' to describe those organizations that will sell products and services that facilitate the delivery, adoption and use of cloud computing. For corporate customers, enablers are expected to build (and optionally maintain) the infrastructure to the cloud, while the rest of it is maintained in house. Enablers will also include specialized software firms that will provide monitoring software, platform migration software, etc. For large enterprises, it is also important to implement an organization-wide consistent IS policy across the different cloud computing services which that might show great promise but probably not have implemented similar policy management tools. Since many of the cloud computing service providers currently lack the core competencies of interacting with customers and actual implementation, we foresee an increasing important role for the enablers in the cloud computing environment (Marston et al., 2011).

2.5.4. Regulators

All the above stakeholders represent different pieces of the cloud computing “value-chain”. In contrast, the role of the regulator whether it is sovereign government body or an international entity is one that pervades across the other stakeholders (Marston et al., 2011). Government as a regulator body can encourage technology usage by establishing suitable laws and providing incentives. A new policy and regulatory framework are required for development, diffusion, and adoption of technology which should enable the use and admittance to basic infrastructure, technology, business and tax laws, and incentives (Priyadarshinee et al., 2017).

2.6. Cloud Computing Service Models

The existing IT ecosystems have undergone structural changes, where IT infrastructures and resources are being increasingly provided as standardized and virtualized cloud services via the Internet. Since the adoptions of Cloud Services are still at a premature stage, it becomes increasingly important to understand the nature of each type of cloud computing service categories in order for organizations to fully benefit from them (Salleh et al., 2012).

2.6.1. Software as a Service (SaaS)

In the case of SaaS application, the user can access services through Web-based software in the browser without installing or maintaining any software. The cloud requires the users to access via a Web-based browser and pay only for “using time” (Tongsuksai et al., 2019). The software is not licensed or owned by the end user, instead provided as a service of which user paid subscription fees and the service can be accessed from a normal internet connection upon use. This type of deployment method is often referred to as Public Cloud and through SaaS user avoids large upfront capital investment (Salleh et al., 2012).

2.6.2. Platform as a Service (PaaS)

Cloud platform services, or Platform as a Service (PaaS), are used for applications, and other development, while providing cloud components to software. The service of application development and deployment platform delivered as a service. This model operates at a lower level of abstraction comparing to SaaS. Among the services offered to customers is to develop,

deploy and maintain applications based on cloud infrastructure. Developers could write their applications according to the specifications of a particular platform without needing to worry about the underlying hardware infrastructure (IaaS) (Rahima et al., 2016).

2.6.3. Infrastructure as a Service (IaaS)

Infrastructure as a Service (IaaS) refers to infrastructure resources which can be accessed by a user in a virtual computer as a service application along with data center space and storage device to support an organization's operations. Moreover, this infrastructure is normally offered by a third party who vigorously provides, reconfigures and configures servers (Tongsuksai et al., 2019). This model enable user to maximize the flexibility to switch providers and user would only pay rent upon the use of infrastructures. IaaS model can also create a specific operating system combined with user own applications (Salleh et al., 2012). The client may not have control over the arrangement but may transfer the applications. However, flexibility originates with a cost and users are accountable for updating and fixing the operating system at the IaaS level (Priyadarshinee et al., 2017).

2.6.4. Everything as a Service (XaaS)

New IT paradigm is increasingly shaped by various emerging trends especially Cloud Computing and Big Data that can be identified by different "as a Service (aaS)" models. The trend of providing everything as a service (XaaS) depicts a promising scenario where service-oriented architecture and design supports the development & deployment of software applications as services. Virtually any industry is transitioning to a service-oriented business model, including subscription-based models. Organizations are facing operational challenges in their service transformation journey. There is the need for a multidisciplinary approach for a new service operating model to be successful. "Anything as a Service" enables all business processes for a service operating model in a holistic way through specialized capabilities (Duan et al., 2015).

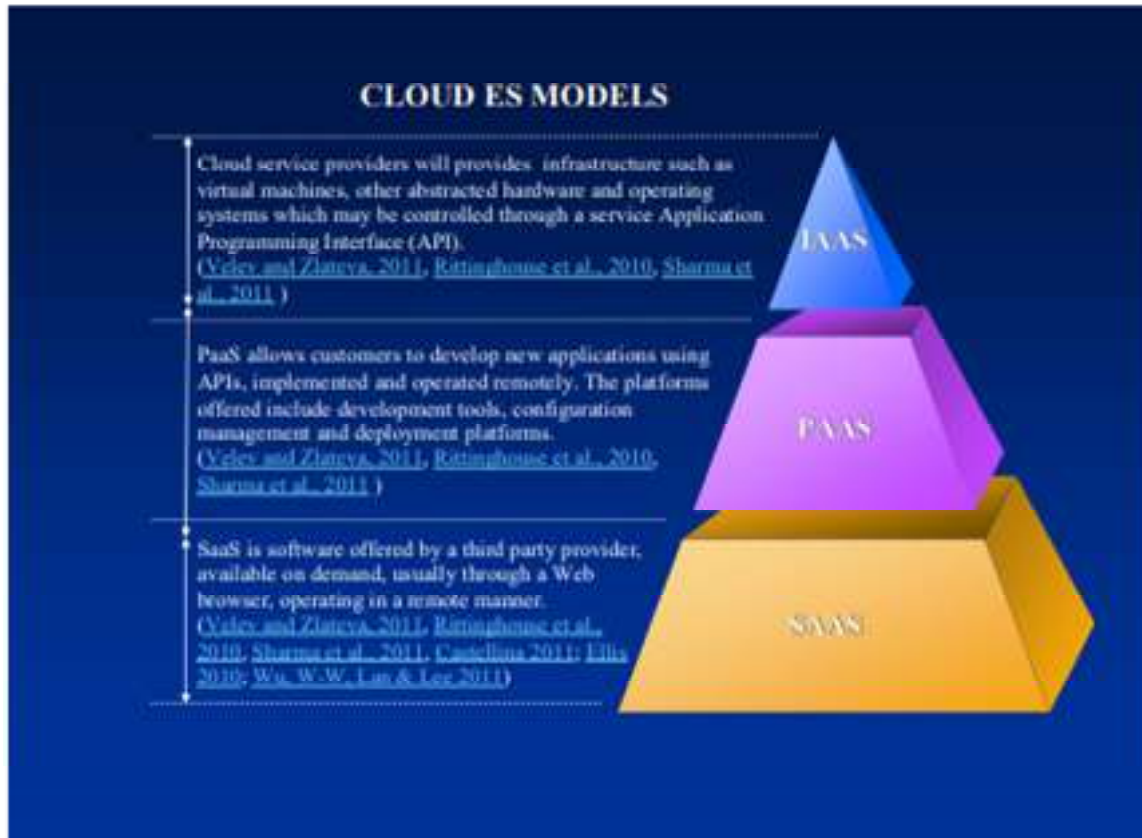


Figure 2.1. Types of Cloud Service Models (Salleh et al., 2012).

2.7. Oracle True Cloud Methodology

ESLSE Oracle Cloud ERP implementation project was conducted based on the Oracle True Cloud methodology which is developed by the oracle company itself and specifically aimed to support Customers to move to the Oracle cloud. The methodology is designed to rapidly deliver a solution based on predefined Solution Sets, Containing implementation accelerators such as oracle reference business process, questionnaires, related application configurations, documentation, common integration pattern designs, data load templates and common use cases. All of the implementation accelerators in the Solution Set are based on many years of implementation experience with Oracle's applications. The use of Solution Sets supports the project team with configuration and validation of the Oracle Solution at the early stages of project implementation. Oracle True Cloud Methodology Consists five stages of Engage, Focus, Refine, Enable and Live-Operate.

A) Engage & Focus

These implementation methodology stages involve overlapping activities of detailed project plan creation for the requirement assessment and creation of high-level designs and refinement architecture. Conduct baseline presentation, including baseline security, reporting, security, reporting, integration and data load capabilities. It is the responsibility of the implementer, Oracle to confirm business architecture includes business objectives, target operation model, current business baseline and target capabilities are among the others.

The key outputs of these activities by the implementer, Oracle are project plan for the Global Template refinement, project charter with defined project roles and responsibilities, architectural principles definition, confirmed business architecture and confirmed Reporting, Security, Data Migration.

B) Refine

Activities under refine stage are performed jointly by Oracle as an implementer and consultant; and ESLSE as a client. Oracle has conducted two rounds of process play back sessions. These sprint iterations were intended to assess the process of the oracle systems with business program objectives of ESLSE. The first process play back was conduct with the objective of indicating any remaining gaps between what is configured in the cloud application and ESLSE program objectives. Oracle functional consultants work with ESLSE respective subject matter experts to verify the list of program objectives that had not been addressed by the configured Cloud Application and assign various remediation actions as per the objective. In the second iteration oracle has elaborated various remediation actions in terms of impact on the overall solution, program budget and time line.

At this stage of Oracle True Cloud methodology, Oracle's cloud adoption lead worked with ESLSE change team and process owners (functional area managers) to identify the impact of change on the existing business process and see any work-around solutions that are selected as outcome of the assessment. Oracle has got confirmed by ESLSE domain area experts list of integration points were common to more than one operating company and defined a canonical data map for each integration points. Here information captured by oracle functional consultants about business objects to be migrated from legacy system those are common to more than one

operation unit and system architect has showed end-to-end architecture of the solution to confirm the alignment of target solution with company's IT strategy.

C) Enable

The Enable stage is the stage where transitioned the configuration with loaded data and integration into a production (Live) state. Oracle has performed final data loading and configuration into the production environment to allow live business operation. Train the trainer sessions conducted into two rounds with selected employees those can train and assist users before, during and after system going-lived. ESLSE was responsible to execute business transition plan to operate under new operating model for processes described in individual solution sets (modules).

Taking cut-over to production system mean to ensure all technical activities are carried out and confirmed all project deliverables are completed. Cloud ERP system going-lived where the solution handed over to ESLSE team and trained end users start using the system as per new business process. Enterprise project team were in place to solve any immediate post-go live issues which might occurred for up to four weeks after go-live together with implementer consultants.

D) Live-Operate

Hyper care is the activity where the user community being supported immediately following go-live. Both functional and technical consultants of Oracle were in place together with ESLSE team to provide support, reinforcing the new or adopted processes and show how the use of the application is enabling these. The key out puts of this stage include delivery of official project completion report and lesson learnt from this specific implementation that can be serve as an input for Oracle's future improvement of methods, materials, plans etc.

2.8. Critical Success Factors of ERP Implementation and Adoption

The term Critical Success Factors (CSF) refers to the required activities to be done by company to ensure the successful technology implementation and adoption. Few of the factors will be discussed in this section.

A) Teamwork & Composition

Teamwork & Composition have been considered by many researchers and practitioners as one of the most critical success factor of ERP system implementation where all functional departments of the enterprise must be involved in the implementation process, and all staff, experts, consultants, and end-users must cooperate with each other to complete the project successfully. The success of the project relies on the skills and the knowledge of the project team members and on the experience of the project manager. Therefore, the selection of the project team members should be appropriate and carefully approached to pick the most skilled and knowledgeable staff with the right experienced manager. Forming the right project team by selecting the right members who deeply understand the business process and have long experience in the organization is crucial (Lynn et al., 2018).

B) Interdepartmental Cooperation and Communication

Another essential factor that is impactful during all the implementation phases for the success of the ERP project is cooperation and communication. Clear communication is needed to align everyone with the different changes and stages of the ERP project. There is a need to create common understanding about the use and benefits of the system while also defining understandable goals to all participants (Shatat & Dana, 2009). The overall communication to create a common understanding amongst participants is important not only for the knowledge but also to help create acceptance to change throughout the organization (Kronbichler, Osterman & Staudinger, 2009).

C) Project Champion/ Empowered Decision Makers

According to Kronbichler, Osterman and Staudinger (2009) a project champion can be defined as an individual that is actively promoting the progress and contributing to the innovation by obtaining support from management and obtaining resources. The champion is a project leader that can act as a decision maker and act as a mediator when it comes to the technology side of the project and the business side (Shatat & Dana, 2009).

D) User Involvement/Training

Training refers to the education provided on new business processes and to what degree that training is provided to the users. In order to apply an ERP system in a firm extensive training of the users is needed in order to gain the most out of the system. For employees to utilize the system they need to be involved from the beginning and gain an understanding of the system's inner workings. Not only is there a need for overall understanding of the ERP system but also its benefits and the technical knowledge needed in order to make smooth transitions without a high level of user resistance. It's important to conduct training programs regularly and keep the users up to date on the ERP system considering the complexity of ERP systems. There are usually large learning curves that users need to overcome (Kronbichler, Ostermann & Staudinger, 2009).

E) Top management support

The top management support CSF has in earlier research been explained in the context of four different dimensions. These different dimensions are concerns that need to be sought by top management and include the following: project dimension, people dimension, process dimension and change management dimension (Kronbichler, Ostermann & Staudinger, 2009). The top management factor is the CSF that has been most frequently noticed in earlier research to contribute with success to the ERP system (Shatat & Dana 2016). According to Kronbichler, Ostermann and Staudinger (2009) there is a need for top management to monitor the project's progress and grant their support for the continuous development of the system.

F) Business process reorganization

The use of ERP systems requires careful planning and alignment with the firm's strategic visions in order to reach successful post implementation of the ERP system. Thus, creating importance of organizing business processes to suit the requirements of the new ERP system or making sure that the ERP system is adapted to suit the firm's business processes (Shatat & Dana, 2016). According to Kronbichler, Osterman and Staudinger (2009) the more customized the system at use, the lower the performance of the system when utilized, thus creating the requirement of ERP systems with low customization which are called "Vanilla Systems". In the definition by Kronbichler, Osterman and Saudinger (2009) the business process reorganization is used as an

umbrella term for earlier definitions of the CSF. These are CSFs such as minimum customization of business process re-engineering, minimal customization, and vanilla ERP.

G) Change management

Change management refers to the overall ability of the firm's environment and culture to adapt and be prepared for change. This is a factor essential in order to be able to utilize ERP systems considering it will be hindering if the process is met by resistance (Shatat & Dana, 2016). In order to get the most out of an ERP system the firm needs employees that can adjust practices and adopt new ones in a changing environment. This is where change management is important in order to change the mindset and attitudes of employees or users of the ERP systems. Users of the systems need to be informed about the potential benefits for themselves and the firm that comes with utilizing ERP systems (Kronbichler, Ostermann & Staudinger, 2009).

2.9. Drivers and Barriers to Cloud-based ERP Adoption

Knowledge about Cloud ES advantages and challenges would enable potential cloud clients to prepare themselves before embarking into this new IT venture (Salleh et al., 2012).

2.9.1. Drivers to Cloud-based ERP Adoption

The greatest advantage that a Cloud Enterprise System (ES) has as compared to on premise ES is that it offers low initial costs, promotes greater emphasis on standardization, provides flexibility for business innovation and allows organization to focus on their strategic activities while leaving the nonstrategic activity to the cloud vendor. In Cloud ES, cloud vendor managed, maintain and deployed IT infrastructure development, hence reduced the IT complexity that users faced when implementing an ES. No further IT investment is required in terms of infrastructure, software and support resources upgrading. Cloud ES is also regarded as utility computing as fee will be charged based on usage. In terms of environmental issues, Cloud ES model proved to be favorable as the entire IT ecosystem footprint is removed (Salleh et al., 2012).

A) Reduced IT Cost for the Enterprise

Cost reduction is a very important factor and opportunity in Cloud Computing. Cost benefits are the strongest driver affecting IT executives' perceptions of SaaS opportunities. Marston et al. (2011) stated that companies need to spend a big part of their balance on the IT infrastructure, while less than 10% of their servers can be really utilized, resulting in a big waste of money. Besides, these servers need to be replaced almost every three years and need to be maintained and administrated, increasing the total cost of IT operations radically. Cloud Computing can reduce these costs remarkably (Marston et al., 2011).

Furthermore, Cloud Computing reduces the cost of entry for small companies and business in developing countries. By adopting Cloud Solutions, small companies can use expensive business analytic software, which requires a high level of IT infrastructure to enhance their business at relatively low cost, while this kind of applications were available only for large companies or enterprises previously (Marston et al., 2011). Cloud computing also represents a huge opportunity to many third-world countries that have been so far left behind in the IT revolution. Some cloud computing providers are using the advantages of a cloud platform to enable IT services in countries that would have traditionally lacked the resources for widespread deployment of IT services (Avram, 2014).

B) Flexibility for Business Innovation

Cloud ERP enables mobility, allowing access from pretty much any device, anywhere, anytime. It reduces barriers to innovation by allowing new classes of applications and services to be delivered that were not possible before. Cloud solutions are new and modern so vendors typically are in a continuous improvement mode, providing better opportunities for IT innovation which paves the way to business innovation (Garverick, 2014).

C) Faster Time to Market for Products and Services

Cloud ERP takes less time to set up since the hardware and software infrastructure are typically maintained by third-party cloud providers. Barring any heavy customization or integration the system can be up and running relatively quickly, benefitting companies by reducing the time to market of their products and services (Garverick, 2014).

D) Scalable on Demand

Scalability is a vital factor that should be considered in terms of performance. As the requirements of the Cloud Computing adopters increase, the cloud provider should be able to scale up their resources and infrastructure to satisfy the adopter's new requirements for storage, processing, and connection bandwidth. On the other hand, scalability in Cloud Computing is one of the main strength points and constitutes an important opportunity for companies. As these companies' requirements change, their infrastructure will be scaled up or down dynamically providing a high level of strategic flexibility (Priyadarshinee et al., 2017).

E) Cloud ERP Vendors Provide Automatic Upgrades

Cloud vendors can upgrade their systems economically because of the single source codes and multi-tenancy features. This increases an organization's capabilities as the upgrades are done automatically by the vendors (Garverick, 2014). Due to multi-tenancy users of cloud services typically do not know (and may not care) where data or code are located; conversely, the same resources (even the same data) may be used by multiple users (even at the same time). This has implications for both infrastructures and the data, applications and services hosted on shared resources but provided to multiple isolated users (Cave, 2012).

F) Environmental Issues

Environmental issues constitute a real concern for companies in this era as more regulations are issued to minimize the carbon footprint organizations leave behind. A previous 'Forrester' survey concluded that most workers in IT departments believe that the efficient use of energy and recycling IT resources are important issues that should be handled properly and these factors constitute the main element of green IT. By migrating the IT functionality into the cloud, companies not only reduce their IT infrastructure but also use the energy in an intelligent way (Marston et al., 2011). However, other researchers suggest that cloud servers are consuming a huge amount of energy and not all cloud providers are following the best standards in energy-efficient consumption, consequently, moving to the cloud does not reduce the global CO2 emissions necessarily. In conclusion, moving to the cloud can reduce the IT infrastructure by sharing with others, and cloud providers can follow best standards in energy-efficient consumption which might not be possible for the small companies as a result of the economy

scale. However, adopters of Cloud Computing should make sure that these providers are applying these environmental standards before adopting their solutions (Priyadarshinee et al., 2017).

2.9.2. Barriers to Cloud-based ERP Adoption

According to Merriam Webster dictionary definition barriers are factors that tend to restrict the free movement, mingling, or interbreeding of individuals or populations. Accordingly, the following are found to be innovation adoption inhibitors in the earlier IS literatures.

A) Security and Privacy

Because cloud computing represents a new computing model, there is a great deal of uncertainty about how security at all levels (e.g., network, host, application, and data levels) can be achieved. That uncertainty has consistently led information executives to state that security is their number one concern with cloud computing. The ability of cloud computing to adequately address privacy regulations has been called into question. Organizations today face numerous different requirements attempting to protect the privacy of individuals' information, and it is not clear (i.e., not yet established) whether the cloud computing model provides adequate protection of such information, or whether organizations will be found in violation of regulations because of this new model (Avram,2014). The physical location of data and its ownership, Service level agreement (SLA) and the data laws and regulations in the country where data is hosted are important factors which become significant with ERP data and functions (Majed & Ahmad, 2018).

B) Vendor Lock-In

Vendor lock-in has been identified as a possible barrier to implementing cloud solutions, and the relationship between the vendor and the consumer of a cloud solution is important in the consumer's decision to move to the cloud. Furthermore, as cloud-based ERP solutions are built on a different service model than the traditional ERP systems, they have consequences for the established control structures within an organization. For example, the IT Department has traditionally controlled the systems and the related infrastructure. When implementing cloud-based ERP solutions, the control is shifted to external suppliers. It follows that the IT

Department will need to adapt and introduce new ways of organizing and training the staff in new skills (Hustad et al., 2020).

C) Government Regulations regarding the Secure Data Storage

Some governmental regulations regarding data storages were made before cloud computing. Since companies are not aware of the data location in the cloud they may be hesitant to use Cloud ERP since they may be in violation of a regulation with which it cannot document compliance. Some cloud ERP systems may not meet strict government regulations or audit requirements for secure cloud data storage (Garverick, 2014).

D) Reliability

Enterprise applications are now so critical that they must be reliable and available to support 24/7 operations. In the event of failure or outages, contingency plans must take effect smoothly, and for disastrous or catastrophic failure, recovery plans must begin with minimum disruption. Each aspect of reliability should be carefully considered when engaging with a Cloud Service Provider, negotiated as part of the Service level Agreement (SLA), and tested in failover drills. Additional costs may be associated with the required levels of reliability; however, the business can do only so much to mitigate risks and the cost of a failure. Establishing a track record of reliability will be a prerequisite for widespread adoption (Avram, 2014).

E) Standardized Software Packages not Easily Customizable

Cloud ERP solutions are often difficult to customize as they come in standardized packages. Customization in cloud ERP refers to the degree to which the software packages are customized to fit the specific requirements of the organization. The cloud infrastructure is owned and management by the cloud services provider and the users have thus very limited control over the system. Therefore, cloud ERP may not be suitable for companies with very specific requirements. For example, existing cloud computing platforms are not designed to accommodate specific requirements such as having distributed data centers at specific locations. This kind of requirements contradicts with the characteristics of cloud computing of having a centralized infrastructure (Zhong & Rohde, 2014).

F) Lack of early adopters because of cloud ERP's low awareness

Cloud ERP is new technology and companies may not be aware of its existence or benefits. Also, cloud ERP products may not have a solid enough track record or reputation for companies to risk such a huge investment in their company's primary information system (Garverick, 2014).

G) Slow Speed (or Loss) of Internet Connection & down time of Cloud Servers

Due to the Cloud ERP system being located at a remote location accessible only over the internet, unavailability of the cloud provider servers or outage of internet service can become a big disaster. Thus, the potential lack of internet speed, connectivity and server availability can be a big obstacle for Cloud ERP adoption (Garverick, 2014).

2.10. Technology Adoption Models

Before diving into theories and models for innovation adoption and innovation diffusion, it is worth taking a step back to understand what is meant by innovation, innovation adoption, and diffusion. Damiano, (2011) refers to the Merriam-Webster dictionary definition which defines it innovation as "the introduction of something new" where that something could be an idea, process, or product. Straub (2009) describes adoption as when an individual integrates a new innovation into their life and diffusion as "the collective adoption process over time". "Technology adoption", according to Fichman and Kemerer (1993), is a broader spectrum of activities, which starts from awareness of the technology through to the widespread deployment of the technology in the organization.

2.10.1. Technology-Organization-Environment (TOE)

According to Tornatzky and Fleischer (1990), adoption of technology is influenced by factors that can be identified through and the environmental contexts as it can be seen on Figure 2.2 below. According to the authors, the technological context refers to how organizations make the technology adoption decision based on the availability of the technology and how it fits with the firm's current technology; organizational context looks at the characteristics of the organization such as its structure, quality of human resources, or the extent to which its size impacts the technology adoption decision; and environmental context refers to the arena of a firm's business

operation which may include such factors as its industry, competitive pressure, and government regulations (Kinuthia,2015).

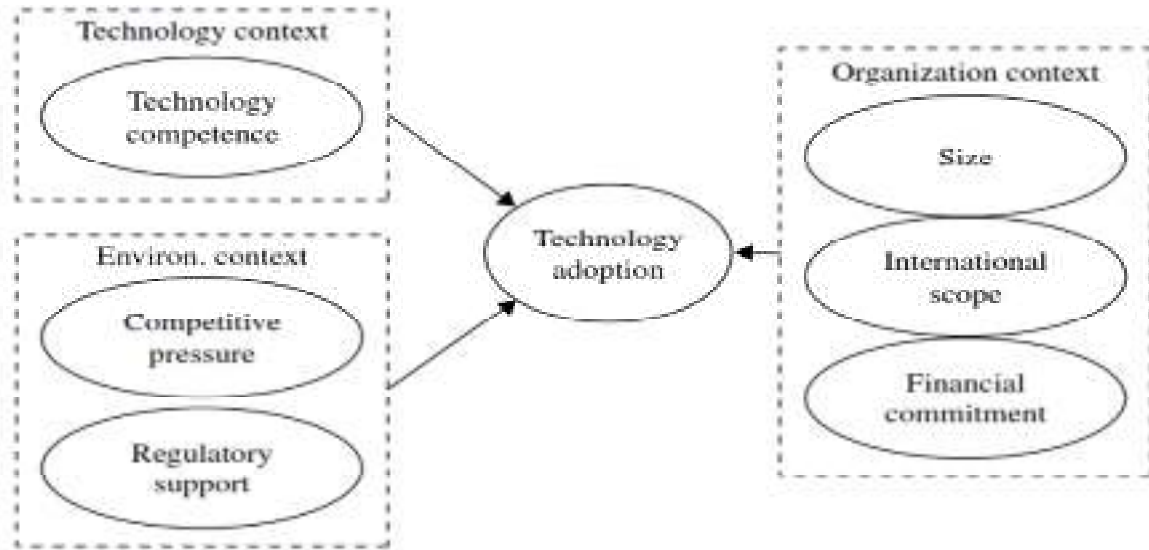


Figure 2.2. TOE Research Model proposed by (Tornatzky and Fleischer, 1990)

2.10.2. Diffusion of Innovation Theory (DIT)

Rogers (1995) proposed that the theory of ‘diffusion of innovation’ was to establish the foundation for conducting research on innovation acceptance and adoption. Rogers synthesized research from over 508 diffusion studies and came out with the ‘diffusion of innovation’ theory for the adoption of innovations among individuals and organization. The theory explicates “the process by which an innovation is communicated through certain channels over time among the members of a social system” (Rogers, 1995). Basically, it’s the process of the members of a social system communicated an innovation through certain channels over time known as diffusion. The Rogers’ (1995) diffusion of innovation theory explained that the innovation and adoption happened after going through several stages including understanding, persuasion, decision, implementation, and confirmation that led to the development of Rogers (1995) S-shaped adoption curve of innovators, early adopters, early majority, late majority and laggards as shown in Figure 2.3. (Lai, 2017).

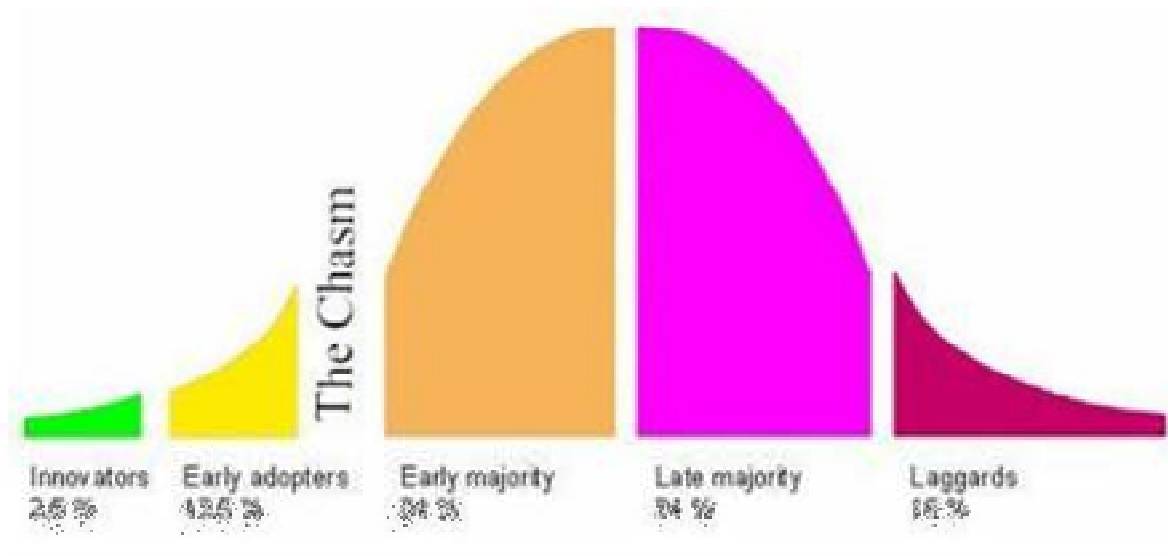


Figure 2.3. Innovation Adoption Curve (Roger, 1995)

2.10.3. The Technology Acceptance Model (TAM)

The technology acceptance model, proposed by Davis (1989) is still one of the most frequently cited frameworks to explain why a particular IT is embraced (or rejected) by users. According to TAM, a specific IT is likely to be accepted by potential users when this technology is perceived to be potentially useful and relatively easy to use. In other words, this model assumes that a prospective user of technology weighs the potential benefits of using a given technology against the challenges in using it, and then adopts or rejects it (Al-Jabri & Roztocki, 2015).

Technology acceptance and adoption is well documented in the IS literature. Although several factors influence the acceptance and use of technologies, TAM, grounded in Fishbein and Ajzen's (1975) research on beliefs, attitudes, and behaviors, indicates that perceived usefulness and perceived ease of use predict attitudes and actual behaviors (Davis, 1993; Nair & Das, 2011). Essentially, TAM captures the user's overall attitude toward technologies. Davis (1993) hypothesized that one's attitude toward using technology is a function of two beliefs: perceived ease of use and perceived usefulness. Perceived ease of use is the degree to which a person believes that using the system would require minimal effort, whereas perceived usefulness is the extent to which the information system enhances job performance (Lederer et al., 2000). Two

other constructs of TAM are a person's attitude toward the use of the system (which is the user's desire to employ the system) and behavioral intention (which is the likelihood of a person will use the system; Davis, 1993; Lederer et al., 2000). Scholars have argued that perceived ease of use of the technology and perceived usefulness determines one's attitude toward a new technology (Davis, 1993; Padmavathi, 2016; Teo, 2011), such as Naviance (Deslonde & Beccerram, 2018).

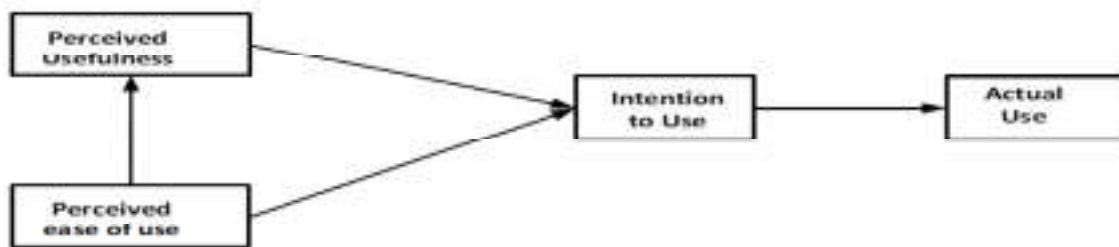


Figure 2.4. The Technology Acceptance Model (TAM) (Davis 1989)

2.10.4. Theory of Reasoned Action (TRA)

The theory of reasoned action (TRA) was developed by Ajzen and Fishbein (1975), largely used to analyze how attitudes consciously influence individual behavior, to explore the attitude formation process of cognitive information as shown in Figure 2.5. The basic assumption of the model is that people are rational, and before performing an action they would synthesize the information they get, consider the significance and consequences of their action. TRA is also widely applied model in the field of social psychology, to explore the actual behavior and behavioral intentions, attitudes, subjective norms, relationship between beliefs and assessments (Lee et al, 2016).

The most proximal cause of behavior is behavioral intention (what one intends to do or not to do). Behavioral intention, in turn, is determined by attitude (one's evaluation of the behavior) and subjective norm (one's evaluation of what important others think one should do), either of which might be the most important determinant of any particular behavior. Usually, this is

revealed empirically by the beta weights obtained from multiple regression analyses, where behavioral intention is regressed on to attitude and subjective norm. If the result is a larger attitude than subjective norm beta weight, the behavior is deemed to be more under attitudinal than normative control, but if the reverse is true, then the behavior is deemed to be more under normative than attitudinal control. In either case, then, it is desirable to know what determines attitude or subjective norm, respectively, if a researcher wishes to influence the behavior. Attitude is determined by behavioral beliefs (beliefs about the likelihood of various consequences) and evaluations of how good or bad it would be if those consequences happened. Subjective norm is determined by beliefs about what specific important others think one should do and how much one is motivated to comply with those important others. Both attitude and subjective norm are assumed to be determined by summative processes. Thus, to form an attitude, people are assumed to sum behavioral belief-evaluation products (attitude = $\sum b_i e_i$), whereas to form a subjective norm, people are assumed to sum normative belief-motivation to comply products (subjective norm = $\sum n_i m_i$) (Trafimow, 2009).

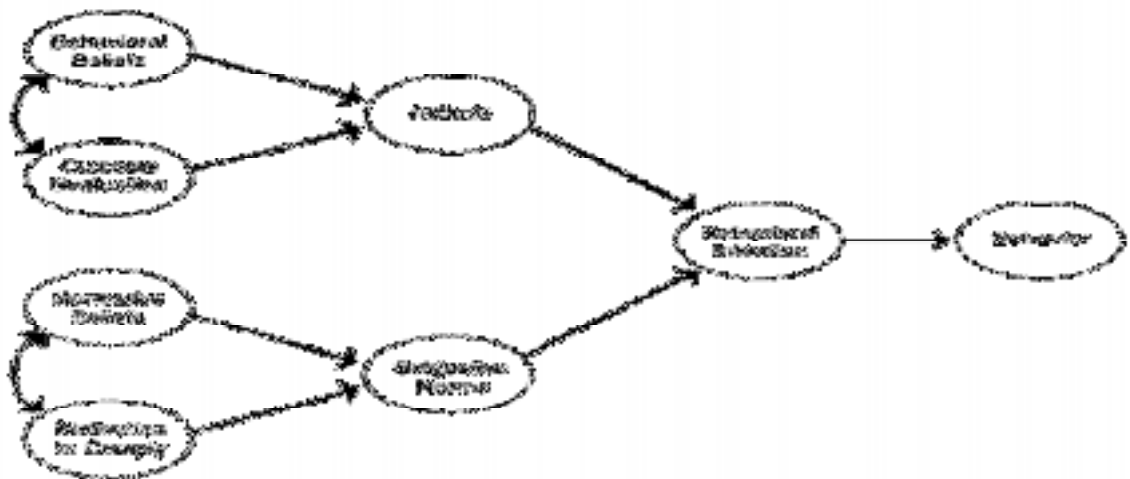


Figure 2.5. The Theory of Reasonable Action (Fishbein and Ajzen, 1975)

2.10.5. Unified Theory of Acceptance and Use of Technology (UTAUT)

The UTAUT (Figure 2.6) suggests that four core constructs (performance expectancy, effort expectancy, social influence and facilitating conditions) are direct determinants of behavioral intention and ultimately behavior, and that these constructs are in turn moderated by gender, age,

experience, and voluntariness of use (Venkatesh et al., 2003). It is argued that by examining the presence of each of these constructs in a “real world” environment, researchers and practitioners will be able to assess an individual’s intention to use a specific system, thus allowing for the identification of the key influences on acceptance in any given context. The theory was developed through the review and integration of eight dominant theories and models, namely: the Theory of Reasoned Action (TRA), the Technology Acceptance Model (TAM), the Motivational Model, the Theory of Planned Behavior (TPB), a combined TPB/TAM, the Model of PC Utilization, Innovation Diffusion Theory (IDT), and Social Cognitive Theory (SCT). These contributing theories and models have all been widely and successfully utilized by a large number of previous studies of technology or innovation adoption and diffusion within a range of disciplines including information systems, marketing, social psychology, and management.

The four theoretical constructs of UTAUT and their moderators:

Performance Expectancy (PE) - is the degree to which an individual believes that using the system will help him or her to attain gains in job performance. The five key variables derived from Technology Acceptance Models that match Performance Expectancy are Perceived Usefulness, Extrinsic Motivation, Job-Fit, Relative advantage and Outcome Expectations.

Effort Expectancy (EE) - the degree of ease associated with the use of the system. The three key variables derived from Technology Acceptance Models that match Effort Expectancy are Perceived Ease of Use (the degree to which the prospective user expects the target system to be free of effort), Complexity and Ease of use (the degree to which an innovation is perceived as being difficult to use).

Social Influence (SI) - Social Influence is the degree to which an individual perceives that important others believe he or she should use the new system. The three key variables derived from Technology Acceptance Models that match Social Influence are Subjective Norm, Social Factors and Image, the degree to which use of an innovation is perceived to enhance one’s image or status in one’s social system.

Facilitating Conditions (FC) - is the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system. There are three

key variables derived from Technology Acceptance Models that match Facilitating Conditions are Perceived Behavioral Control, Facilitating Conditions and Compatibility.

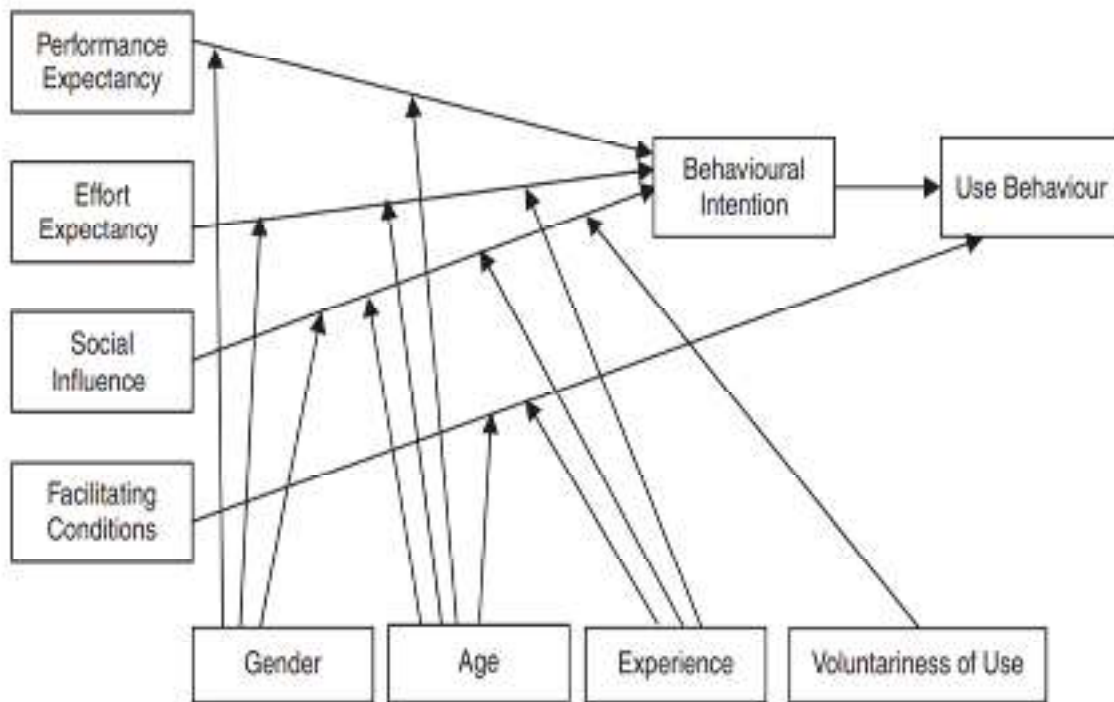


Figure 2.6. Unified theory of acceptance and use of technology (Venkatesh, 2003)

2.10.6. Theory of Planned Behavior (TPB)

Ajzen (1991) developed Theory of Planned Behavior which is about one factor that determines behavioral intention of the person's attitudes toward that behavior as shown in Figure 2.7. The first two factors are the same as Theory of Reasonable Action (TRA) (Fishbein and Ajzen, 1975). The third factor that is known as the perceived control behavior is the control which users perceive that may limit their behavior (Pc Lai, 2017).

As in the original theory of reasoned action, a central factor in the theory of planned behavior is the individual's intention to perform a given behavior. Intentions are assumed to capture the motivational factors that influence a behavior; they are indications of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behavior. As a general rule, the stronger the intention to engage in a behavior, the more likely

should be its performance. It should be clear, however, that a behavioral intention can find expression in behavior only if the behavior in question is under volitional control, i.e., if the person can decide to perform or not perform the behavior. Although some behaviors may in fact meet this requirement quite well, the performance of most depends at least to some degree on such non motivational factors as availability of requisite opportunities and resources (e.g., time, money, skills, and cooperation of others). Collectively, these factors represent people's actual control over the behavior. To the extent that a person has the required opportunities and resources, and intends to perform the behavior, he or she should succeed in doing so.

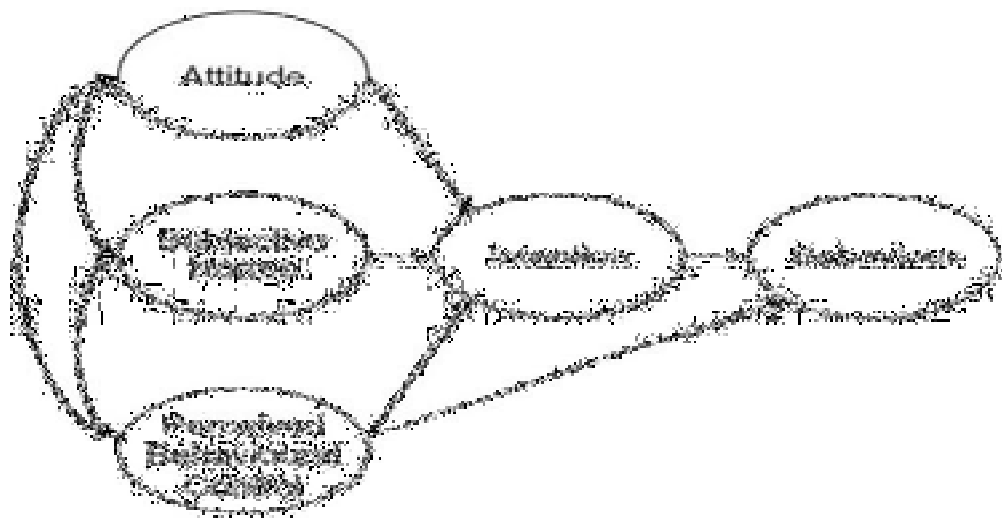


Figure 2.7. The Theory of Planned Behavior (Ajzen, 1991)

2.10.7. The Model of Innovation Resistance (MIR)

The model of innovation resistance (MIR) was introduced by S. Ram (1987). He stated that innovation resistance is not the obverse of innovation adoption. Instead, for innovation to be adopted, it must overcome some initial resistance. Thus, the length of time of resistance demonstrates whether or not the innovation will be well-received. If resistance is too high, the innovation dies, and adoption will fail. Furthermore, resistance and adoption can coexist during the stages of innovation (S. Ram et al., 1987). Ram identified two main causes of innovation resistance: perceived risk and cognitive resistance (S. Ram et al., 1987). Yoo and Lee (1989) , who used MIR as the main acceptance theory, shows that with anxiousness and risk-awareness about wrong purchases, consumers feel that they are losing money due to innovation, or that

their confidence is threatened. When the information or belief about innovation is unclear and confusing, the consumer becomes psychologically defensive and can resist. Benlian and Hess (2011) identified that security threats are the dominant factors influencing IT executives' overall risk perceptions.

2.11. ERP Adoption in Ethiopia

The ability to access computing resources or develop robust IT infrastructure in developing countries has been difficult. Cloud computing as a new computing paradigm can now provide remote access to these resources that were otherwise inaccessible. The emergence of cloud computing will change the stakes for entrepreneurs, small and large businesses, and researchers and governments (Solomon et al., 2017). However, broadband network access was identified as the main essential service for a successful cloud computing offering (Mujinga & Chipangura, 2011). Despite Cloud computing promises to bring substantial benefits to businesses in Ethiopia, to the best knowledge of this researcher there are limited number of studies conducted on cloud computing specifically Cloud ERP adoption issues (Solomon et al., 2017).

Solomon (2017) study has explored the emergence and adoption of cloud computing by enterprises in sub Saharan Africa, Specifically in Ethiopia. The Grounded theory research methodology has been followed in the study. The research has applied qualitative techniques and analyzed data from nine enterprises regarding the adoption of cloud computing as an IT strategy. Exploratory research method were employed, the qualitative data were collected through open-ended face-to-face semi-structured interviews, supported by observations was analyzed using 'Glasserian' grounded theory approach. These enterprises were span the finance, information and communication technology (ICT) training, research, construction and manufacturing sectors in Ethiopia. The study found that contrary to the literature on cloud computing adoption in the global north, these enterprises are yet to adopt cloud computing as an IT provisioning method and they lack awareness of the advantages and disadvantages of adopting the cloud. The enterprises were also concerned with challenges like security, privacy and trust issues as well as government telecommunications infrastructure policies and cloud technology skills acquisition. This research has created awareness on the challenges and potential benefits of cloud adoption in Ethiopian Private and Public enterprises.

Estifanos (2020) in his recent doctoral study has explored the factors that caused lack Trust in Cloud Computing by a Governmental Organization in Ethiopia. The purpose of this qualitative, single case study was to provide a deeper understanding of how a governmental organization in Ethiopia overcame the factors that adversely influenced managers of government organizations to the extent that they distrusted and decided against adopting cloud computing. The population for this study was comprised of 12 managers from a governmental organization in Ethiopia who had successfully overcome the negative factors, distrust and, consequently, decided to trust and adopt cloud computing. The conceptual framework for this study was derived from the technology-organization-environment model. Data were collected using semi-structured interviews, observing meetings, and reviewing organizational documents. Thematic analysis techniques were used in coding the data and developing themes. The emergent factors that helped managers to overcome negative factors included building trust in, and forming agreements with cloud service providers; being a good follower; having senior management support; and meeting customers' demands. The study has recommended to a telecom regulatory authority to improve the infrastructure of the country. Government decision-makers should consider policies to enhance the success of cloud-based service implementations. The results of the study believed to contribute to economic growth by firms in adopting cloud computing to automate their services which could lead to positive social change within the population.

Abere (2015) has discussed the factors and challenges of cloud computing adoption in some selected organizations in Ethiopia. The study has investigated the cloud computing adoption readiness of 7 selected Organizations from four different sectors. The study has used the Technology Organization Environment (TOE) framework. Research data were collected through interviews. The data was analyzed using qualitative data analysis methods. The researcher has also validated the guideline by different experts in the works at managerial and Technical level. The result of this study can use the strategic guideline to organizations to determine the direction, strategy, and resource allocation when they decided to migrate from traditional to cloud-based environment. The researcher also suggested if organizations followed the guidelines proposed by the study, their cloud computing readiness level will be improved and they will benefit from a successful cloud computing implementation.

Bekele (2014) has explored the factors that affect the decision to adopt cloud computing technology by Ethiopian banking sector. The study was aimed to explore the internal and external factors that have influenced IT executives and expert's decision on the adoption of cloud computing focusing on the Ethiopian banking sector. Mixed research methods, utilizing both qualitative and quantitative methodologies were used. Interview was used to gather qualitative data and survey was used to gather quantitative data. Principal Component Analysis (PCA) was used for analysis of the responses.

The result of this study indicated that the internal factors: complexity, compatibility, employee skills, risk of failure and external factors: customer demand, external pressure, cost, and consistency of cloud computing were found to have a positive influence on decision to adopt cloud computing. However, the internal factors: organizational infrastructure, firm size, relative advantage and the external factors: competition, government rules, regulations, proclamations, security, cloud vendor's support, network bandwidth, and availability of cloud services were found not to have an influence on the adoption of cloud computing technologies in Ethiopian banking sector.

2.12. Review of Related Works

The existing IT ecosystems has undergone structural changes, where IT infrastructures and resources are being increasingly provided as standardized and virtualized cloud services via the Internet (Karabek et.al., 2011). To enhance the sustainability of business operations, enterprises have interests in enterprise resource planning (ERP) transitions from an existing on premise method to a cloud-based system (Ahn & Ahn, 2020). However, the adoption of cloud ERP in developing countries is still in its early stages, and little research has been conducted to investigate this issue (AlBar and Hoque, 2017). Ahn & Ahn (2020), in a recent study, based empirical analysis has found that the factors of organizational culture, regulatory environment, relative advantage, trialability, and vendor lock-in all had a significant influence on the intention to adopt cloud-based ERP, while information and communications technology skill, complexity, observability, data security, and customization had no significant influence on the intention to adopt cloud-based ERP. A survey was conducted to verify the research model. Data were collected from chief executive officers and key stakeholders such as IT directors who represented each company's adopting and operating ERP systems. The population targeted was

CxOs and key stakeholders of enterprises, because they have the authority to make cloud-based ERP system adoption decisions. The study has conducted a comprehensive analysis using the technology-organization-environment, diffusion of innovation, and the model of innovation resistance frameworks. Measured items regarding TOE and innovation characteristics were selected from prior studies. The study's findings expected to provide meaningful guidance for companies that want to adopt cloud-based ERP, governments that support enterprises digitalization, and vendors who sell cloud-based ERP systems products (Ahn & Ahn, 2020).

Leow et.al (2016) in their research, have investigated the effect of cloud security and data privacy, cost effectiveness, Internet reliability, top management support, and competitive pressure factors on the intention to adopt cloud-based ERP system by Small and Medium Enterprises (SMEs) in Penang, Malaysia. The study has employed a survey method where 300 SMEs in both manufacturing and service sectors were selected from a list taken from the SME Corporation Malaysia (SME Corp) website. Statistical Package for Social Science (SPSS) was used to analyze the collected data. There were 51 valid data records from the manufacturing sector as well as 51 valid data responses from the service sector. The study has developed a theoretical model using the Technological Organizational Environmental (TOE) framework and formulated several hypotheses. The results of this study have revealed that the top management support factor significantly and positively correlates with the intention to adopt cloud-based ERP system in manufacturing SMEs only. In addition, the analyses have found that all the factors have no significant impact on the intention to adopt cloud-based ERP system in both sectors. The output of the research has served as guidelines for cloud-based ERP providers, SMEs, as well as the Malaysian government in order to encourage the application of cloud-based ERP systems by SMEs (Leow et al., 2016).

Kinuthia (2014) in his doctoral study has determined the differences between organizations that adopted Cloud Enterprise Resource Planning (Cloud ERP) systems and organizations that did not adopt Cloud ERP systems based on the Technological, Organizational, and Environmental (TOE) factors. Relevant technological factors were identified as relative advantage of Cloud ERP systems, compatibility of Cloud ERP systems, and security concern of Cloud ERP system environment. Organizational factors included top management support, organizational readiness, and size of the organization, centralization, and formalization. External environment factors were

identified as competitive pressure and vendor support. A survey was developed using constructs from existing studies of technology adoption and modified to fit the research. Using the survey, data were collected from individuals throughout the United States of America who identified themselves as working in an Information Technology (IT) job. Analysis from 159 respondents indicated that all the proposed TOE factors were significant predictors of Cloud ERP systems. In comparison to organizations that did not adopt Cloud ERP systems, organizations that adopted Cloud ERP systems had the following characteristics: higher level of relative advantage, higher level of compatibility, higher level of security concern, higher top management support, higher level of organization readiness, bigger sizes, more centralized, more formalized, higher competitive pressure, and perceived Cloud ERP system vendors as offering more support (Kinuthia, 2014).

A study by Ahmad & Waheed (2015) has tried to create theoretical understanding about cloud benefits, to explore the applications and issues related to cloud computing in IT and Telecom companies of developing countries. TOE framework has been employed to investigate the factors affecting cloud computing adoption; and qualitative research approach is used to analyze this exploratory phenomenon. Structured interviews were conducted and quotations of the interviewees were used for developing relevant themes of study. Factors identified through this research were classified according to TOE framework. Emerging features such as online games, data backup, social media, remote access, storage, and ease of use are discussed under the domain of technology. However, knowledge management, CRM, documents collaboration and licensing are the new features in organizational context. Moreover, awareness, user training and electricity shortfall were major environmental issues faced by developing countries for using cloud services.

2.13. Research Gap

Cloud computing being a relatively recent phenomenon, the research on issues concerning the adoption of cloud based ERP by both organizations and individuals is still in a nascent stage. Among the research studies on the adoption of Cloud ERP technologies conducted so far, quite a few have approached the problem from the perspective of organizations and not from individual user's perspective (Tashkandi and Al-Jabri, 2015). Thus, this research study fills an important

research gap by identifying the key factors that influence the adoption of Cloud ERP by users in business organizations in Ethiopia based on case enterprise considered for this study.

2.14. Chapter Summary

In this Chapter, literatures relevant to Cloud ERP adoption are reviewed. The overall cloud computing technologies and ERP related topics have been discussed including business value of IT, cloud computing technologies and service models, cloud based Vs. on premise ERP systems features described. Critical success factors of ERP implementation and adoption has been presented with drivers and barriers of cloud ERP adoption by organizations. The Oracle's True Cloud implementation methodology incorporating 5 major stages have been discussed. Technology adoption models including the TOE framework has been discussed in this chapter. Finally pertinent local and international researches have been reviewed.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1. Overview

Research methodology is the set of processes, methods, tools and techniques deployed and used to conduct a research and help to reach to the final output of the study. The research model and hypothesis, research design, research method, study population and sampling techniques, data source and collection methods, and data analysis are discussed in more detail in this section. All the elements in this chapter are constructed based on the research intent which identifies the factors affecting cloud based ERP adoption in Ethiopia.

3.2. Research Design

A research design is the procedures for collecting, analyzing, interpreting and reporting data in research studies (Robson, 2002). It is the overall plan for connecting the conceptual research problems with the pertinent (and achievable) empirical research. In other words, the research design sets the procedure on the required data, the methods to be applied to collect and analyze this data, and as to how all of this is going to answer the research questions. As explained by Creswell (2014), there are four possible forms of research design: descriptive, explanatory, correlational and exploratory. His base of classification relies on the purpose of the research area as each design serves a different purpose.

The purpose of a descriptive study is to provide a picture of a situation, person or event or show how things are related to each other and as it naturally occurs. However, descriptive studies cannot explain why an event has occurred. The purpose of correlational research is to examine whether there is a relationship between two or more aspects of a situation or phenomenon. It is aimed to discover or establish the existence of a relationship/ association/ interdependence between two or more aspects of a situation. On the other front, an explanatory study sets out to explain and account for the descriptive information. So, while descriptive studies may ask ‘what’

kinds of questions, explanatory studies seek to ask ‘why’ and ‘how’ questions. It builds on exploratory and descriptive research and goes on to identify actual reasons why a phenomenon occurs. Explanatory research looks for causes and reasons and provides evidence to support or refute an explanation or prediction. It is conducted to discover and report some relationships among different aspects of the phenomenon under study. Exploratory research is conducted when enough is not known about a phenomenon and a problem that has not been clearly defined (Creswell, 2014).

As presented in section 1.5.1, the main objective of this study is to assess factors influencing cloud ERP adoption. To that end, it aims to explore the relationship between diffusion of innovation, innovation resistance; and technology, organization and environmental constructs to cloud ERP adoption in Ethiopia. To achieve this, an empirical research method with a deductive approach is employed. This method is applied to obtain and analyze information about factors affecting cloud ERP adoption with a focus on users of Oracle Cloud ERP at Ethiopian Shipping and Logistics Service Enterprise head office and nine local branch dry ports, on vessels and foreign Djibouti office. In order to successfully address the aim, and come up with valid and reliable results, this is a correlational research.

3.2.1. Research Approach

The research approach is an inquiry strategy that revolves around the underlying assumptions based on which the research design, as well as data collection, is developed (Myers, 2009). The selection of a research approach is also based on the nature of the research problem or issue being addressed, the researchers’ personal experiences, and the audiences for the study. As per the most known classification, there are mainly three research approaches: qualitative, quantitative, and mixed methods. Unquestionably, the three approaches are not as discrete as they first appear. Qualitative and quantitative approaches should not be viewed as rigid, distinct categories, polar opposites, or dichotomies. Instead, they represent different ends on a continuum (Newman & Benz, 1998).

Qualitative research is an approach for exploring and understanding the meaning individuals or groups ascribe to a social or human problem. The process of research involves emerging questions and procedures, data typically collected in the participant’s setting, data analysis

inductively building from particulars to general themes, and the researcher making interpretations of the meaning of the data. Quantitative research is an approach for testing objective theories by examining the relationship among variables. These variables, in turn, can be measured, typically on instruments, so that numbered data can be analyzed using statistical procedures. The final written report has a set structure consisting of introduction, literature and theory, methods, results, and discussion. Whereas mixed methods research is an approach to inquiry involving collecting both quantitative and qualitative data, integrating the two forms of data, and using distinct designs that may involve philosophical assumptions and theoretical frameworks. The core assumption of this form of inquiry is that the combination of qualitative and quantitative approaches provides a more complete understanding of a research problem than either approach alone (Creswell, 2014). As noted by Addo & Eboh (2014), a quantitative method is best suited when the emphasis is on testing and verifying a hypothesis. Therefore, a quantitative research approach is used in conducting this research.

3.2.2. Research Method

Research methods may be understood as all those methods/techniques that are used for conducting research. Research methods or techniques, thus, refer to the methods the researchers use in performing research operations. They involve the conduct of experiments, tests, surveys, case study and the like. In other words, all those methods which are used by the researcher during the course of studying his research problem are termed as research methods (Kothari, 2004).

Surveys are concerned with describing, recording, analyzing and interpreting conditions that either exist or existed. The researcher does not manipulate the variable or arrange for events to happen. Surveys are only concerned with conditions or relationships that exist, opinions that are held, processes that are going on, effects that are evident or trends that are developing. Whereas, Experimental research provides a systematic and logical method for answering the question, “What will happen if this is done when certain variables are carefully controlled or manipulated?” In fact, deliberate manipulation is a part of the experimental method. In an experiment, the researcher measures the effects of an experiment which he conducts intentionally. Similarly, case study method is a very popular form of qualitative analysis and involves a careful and complete observation of a social unit, be that unit a person, a family, an

institution, a cultural group or even the entire community. It is a method of study in depth rather than breadth. The case study places more emphasis on the full analysis of a limited number of events or conditions and their interrelations (Kothari, 2004).

As noted by Kothari (2004), a survey method is best suited when the emphasis is on hypothesis formulation and testing the analysis of the relationship between non-manipulated variables. Therefore, a survey research method is employed in conducting this study.

3.3. Sources of Data

There are many ways of classifying data. A common classification is based upon who collected the data. Data that has been collected from first-hand-experience is known as primary data. Primary data has not been published yet and is more reliable, authentic and objective. Primary data has not been changed or altered by human beings; therefore its validity is greater than secondary data. Data collected from a source that has already been published in any form is called as secondary data. Secondary data is essential, since it is impossible to conduct a new survey that can adequately capture past change and/or developments (Kabir, 2016). This research has used primary data collected through questionnaires from randomly selected Oracle Cloud based ERP system users of study organization, ESLSE.

3.4. Study Population and Sampling

The entire set of cases from which researcher sample is drawn is called the population. Since, researchers neither have time nor the resources to analysis the entire population so they apply sampling technique to reduce the number of cases and select representative sample (Taherdoost, 2016). For this study, as of April 2021, the number of Oracle Cloud ERP system users at head office and local branch offices including foreign Djibouti branch office were 1130. Users are the employees of the organization who have attended user training on the application and with minimum of single role in the system and expected to interact with the Oracle ERP system to perform their daily routines.

In order to determine the sample size, the researcher used the formula recommended by (Yamane, 1967)

$$n = \frac{N}{1 + N * e^2}$$

Where,

- n is a sample size
- N is a total population
- e2 is a probability of an error

Thus, the sample size for this study is determined as follows:

$$n = 1,130 / (1 + 1,130 * 0.05^2)$$

$$n = 295$$

Since this research is aimed to identify and analyze factors affecting Cloud ERP adoption in Ethiopia, considering all organizations and cloud ERP users in the country would have been better. However, due to time, money and other constraints, only the Ethiopians Shipping and Logistics Services Enterprise, case organization users have been selected for this study. To make sure the manageability of the research process and guarantee the achievement of the reliable outcome, a stratified random sampling technique was used for the selection of the users. In stratified random sampling method, each unit of the strata or group of population at head office and branch offices from local and foreign has an equal chance of inclusion in the study. Accordingly, the population of this study consists of Oracle Cloud ERP users who have at least one role and data access in the system and using it to perform their daily routines. The enterprise has nine dry port offices at different parts of the country and one office at Djibouti, main corridor port to Ethiopian import and export trade. The questionnaire has been distributed to head office, local branch offices and Djibouti foreign office respondents based on their proportion of study population. This believed to avoid the bias and increase the representativeness of the research outcome.

3.5. Data Collection Instrument

Data collection is the process of gathering information on variables of interest in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes. The goal for all data collection is to capture quality evidence that translates to rich data analysis and allows the building of a convincing and credible answer to questions that have been posed (Kabir, 2016).

The purpose of this quantitative case study was to explore the factors that affect Cloud base ERP adoption in Ethiopia. The overarching research question was: what are key factors that affect cloud adoption in Ethiopia? Data collection process pertaining to the research questions resulted from structured questionnaires. Questionnaire is a self-report data collection instrument that each research participants complete as part of a research study. Researchers use questionnaires to obtain information about the thoughts, feelings, attitudes, beliefs, values, perceptions, personality, and behavioral intentions of research participants (Abbas et al., 2020). Questionnaires have advantages over some other types of surveys in that they are cheap, do not require as much effort from the questioner as verbal or telephone surveys, and often have standardized answers that make it simple to compile data. As a type of survey, questionnaires also have many of the same problems relating to question construction and wording that exist in other types of opinion polls (Kabir, 2016).

The questionnaire was adopted from previous similar studies and a personal experience of the researcher has also been included. As stated, this research has used a closed questionnaire as a primary data collection instrument. The subject questionnaire had two components one for demographic data and another for main items to measure each variable. The demographic component is composed of educational level, and experience using the Enterprise Systems which are likely to influence Cloud ERP adoption. The five-point Likert scale is used for statements of the second category ranging from strongly disagree to strongly agree, where [1= strongly disagree, 2= disagree, 3= neutral, 4= agree, and 5= strongly agree].

The questionnaire was first outlined using the English language as it is the language used for writing this research and the original constructed items adapted from Ahn & Ahn (2020). However, Amharic, which is one of the dominant languages spoken in the country, is the national language of Ethiopia where this questionnaire managed in both languages. Hence, the original questionnaire prepared in the English language translated into the Amharic language by a licensed official language translator. Furthermore, the Amharic version was translated back into the English language for equivalency and the two versions were confirmed for meaning consistency.

3.6. Data Analysis Method

Yin (2018) noted that the purpose of data analysis is to characterize, understand, and interpret the data, and then generate quality results. Data analysis started once the questioners have been collected from participants. It involves the major activities of data editing, data coding, data entry and data cleaning (Christelle, 2007). Questionnaire data has been encoded to the computer system with the help of MS Excel 2010 and MS Word 2010. Once the excel data get ready, it was converted to CSV format which is compatible to load to Smart PLS. The researcher has mainly used Smart PLS for data analysis and SPSS (Statistical Package for the Social Sciences) used to measure the frequency and demographic distribution of respondents. Structural Equation Modeling (SEM) using Partial Least Squares (PLS) has been used for path coefficient modeling due to its capability of testing the effects of several interaction items. SEM is a statistical technique for testing and estimating causal relationships between variables based on statistical data and qualitative causal assumptions while PLS is a component-based approach for testing structural equation models (Fornell & Larcker, 1981; Henseler, et al., 2016).

3.7. Conceptual Framework (i.e. including Hypotheses)

A hypothesis is a statement of the researcher's expectation or prediction about relationship among study variables. The three basic aspects important in the hypothesis are: difference that we are trying to find out, relationship, and the interactions. In relationship, we are trying to understand statistically significant relationship that means the difference in result did not occur by chance but due to statistical reasons (Dayanand, 2018).

This study is aimed to identify factors those affect cloud-based ERP adoption in Ethiopia. In Information systems research, several theories have been used to explore new technology adoption. For this study, the researcher used diffusion of innovation, the model of innovation resistance and TOE frameworks to conceptualize the cloud ERP adoption in government owned public enterprise, ESLSE established to provide logistics services to customers. Tornatzky and Fleischer (1990) described that the TOE model as a process of technological innovation with the features of technology, organizational readiness, and the environmental condition of an organization that drives the adoption of new technologies (innovation). Several researchers also asserted that the TOE model provides an excellent theoretical foundation to explore information

system adoption behavior in the context of business organizations. Review of extant literature demonstrates that the organizational-level theory has different elements to influence cloud computing adoption decisions includes (a) the technological context, (b) the organizational context, and (c) the environmental context (Estifanos, 2020).

In this study, the researcher synthesized the elements from the diffusion of innovation, innovation resistance and technological, organizational, and environmental contexts based on pervious relevant literatures.

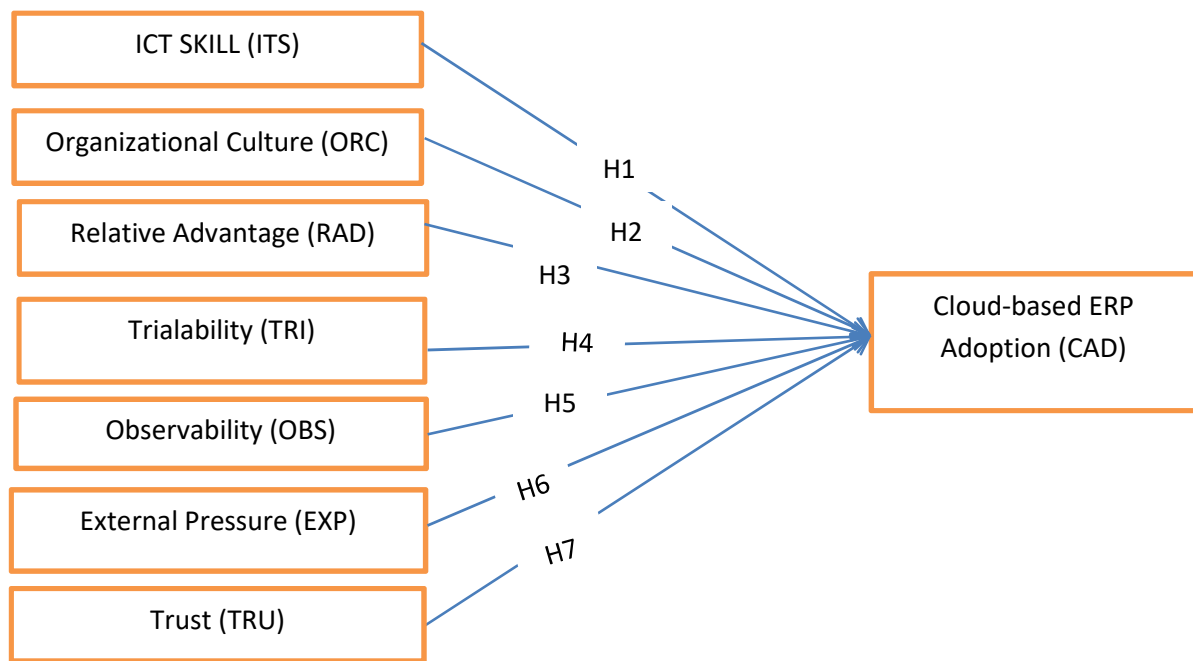


Figure 3.1. Conceptual Framework (Adopted from Ahn & Ahn, 2020)

TOE, Innovation, and Resistance Characteristics of Research Model

The adopted research model combines TOE, innovation, and resistance characteristics of technology acceptance and empirically examines the impact on cloud-based ERP adoption. The conceptual framework includes Cloud-Based ERP Skill (ICT Skill) from technology context, Organizational Culture from organization context, relative advantage, trialability and observability for innovation context, external pressure from environmental context and trust from resistance context (Estifanos,2020 ; Ahn & Ahn, 2020).

Cloud-Based ERP Skill (ICT Skill) - The technological context comprises employees' ICT skills and the ICT infrastructure. Though a cloud-based ERP is unquestionably a labor-saving and innovative technology, adoption is challenging and confusing due to the fact that it needs essential ICT skills. Lutovac and Manojlov (2012) found that if an organization's employees lacked certain ICT skills, they would be distressed and eventually lose motivation, investing more time and energy in the adoption of ERP solutions. Business owners that have poor ICT skills might be declined to adopt ICT, and thus perceive IT adoption as difficult. Deficiencies in or a lack of ICT skills and knowledge is a critical challenge affecting most of organizations. Based on the mentioned previous studies, it is hypothesized that cloud-based ERP skill positively impacts cloud-based ERP adoption intention (Ahn & Ahn, 2020).

Hypothesis 1 (H1). Cloud-based ERP skill (ITS) is positively (+) related to the adoption of cloud-based ERP (CAD).

Organizational Culture - One of the most critical challenges faced by firms in ensuring the success of ERP is that of organizational culture (Al-Ma'aitah Atwah Mohammad, 2017). Organizational culture could be strongly associated with technology adoption in general, and cloud computing in particular (Senarathna, 2016). The low user adoption was mainly because of that culture of the company has impacted negatively on the ERP system implementation successes. The negative culture of the company was evidenced with unfavorable beliefs, attitudes, assumptions, norms, values and behavioral patterns of its employees which hindered their behavioral intention towards the ERP adoption. In addition, lack of top management support, poor leadership style, poor change management, and lack of training and discipline of users have also caused low user adoption of the ERP system (Senarathna, 2016). Cultural attributes such as collaboration, consensus and cooperation are essential ingredients to achieve successful adoption of an ERP system (Al-Ma'aitah Atwah Mohammad, 2017). Based on these findings, this researcher developed the following hypothesis.

Hypothesis 2 (H2). Organizational Culture (ORC) is positively (+) related to the adoption of cloud-based ERP (CAD).

Relative Advantage – Rogers (1983) defines relative advantage as the degree to which an innovation is perceived as being better than the idea it supersedes. This clearly shows the link

between innovation and value creation. These value creations can be achieved through reducing costs, improving business knowledge, creating new and appropriate services, etc. Moreover, innovations that are perceived by individuals as possessing greater relative advantage display a more rapid rate of adoption (Alhajaj M Khaled, 2018). Low et al. (2011) revealed that relative advantage, competitive pressure, firm size, relative advantage, top management support, and business partner pressure characteristics had a significant effect on the adoption of cloud computing. In light of these findings, this study hypothesizes the following:

Hypothesis 3 (H3). Relative advantage (RAD) is positively (+) related to the adoption of cloud-based ERP (CAD).

Trialability - Trialability refers to whether the innovation can be tried out for a limited time period before an actual outlaying of the particular innovation. Trialability reduces the perceived risk of purchasing (an unsuitable) new innovation and the adoption rates will rise substantially. This is more significant for early adopters rather than later adopters as the latter can get an indication of how the innovation performs from previous adopters. Therefore, when it comes to exploring new innovations, trialability is more significant for early adopters and innovators (Rogers 1995). Thus, the following hypothesis is put forth:

Hypothesis 4 (H4). Trialability (TRI) is positively (+) related to the adoption of cloud-based ERP (CAD).

Observability - Observability is defined as “the degree to which the results of an innovation are visible to others” (Rogers 2003). The innovation’s observability, as seen by members of any social system, pertains to the rate of adoption. The study by Alhajaj, 2018 has found that organizations that well aware of ERP system’s use in their industry had relatively faster rate of adoption. Therefore, observability has a strong significant positive relationship with computer adoption and use (Alhajaj M Khaled 2018). Based on these findings, the following hypothesis is put forth:

Hypothesis 5 (H5). Observability (OBS) is positively (+) related to the adoption of cloud-based ERP (CAD).

External Pressure - Wang and Lo (2016) noted that the external pressure that influences the success of an organization in adopting new technologies includes government entities, customers, and service providers. There is a positive relationship between external pressures, such as regulatory pressure, and the success of adopting cloud computing for organization services. When the external pressure is elevating, the chance of organizations adopting new technologies is very high. Thus, the previous empirical findings lead us to hypothesize the following:

Hypothesis 6 (H6). External pressure (EXP) is positively (+) related to the adoption of cloud-based ERP (CAD).

Trust - Trust is a critical success factor for adopting cloud computing. For instance, for governmental organizations to adopt new technology needs system security, a TOE framework technology element, and trust that must exist among users, service providers, and consultants based on goodwill, contractual agreements, and competency. Contractually, the service providers are required to deliver an organization with all information, including its capabilities and limitations. For managers to make an informed decision, the relationship between the organizations and service providers should be built based on trust (Estifanos, 2020). Thus, the previous study findings lead us to hypothesize the following:

Hypothesis 7 (H7). Trust (TRU) is positively (+) related to the adoption of cloud-based ERP (CAD).

3.8. Validity and Reliability

Although the concepts of validity and reliability are closely related, they express different properties of the measuring instrument. Generally, a measuring instrument may be reliable without being valid, but if a measuring instrument is valid, it is also likely to be reliable. However, reliability alone is not sufficient to ensure validity. Even if a test is reliable, it may not accurately reflect the desired behavior or quality. For this reason, researchers must test both the Validity and Reliability of the measuring instrument they intend to use. The measuring instrument must satisfy these two conditions. Otherwise, it will not be healthy for researchers to interpret the research findings.

Validity refers to whether the measuring instrument measures the behavior or quality it is intended to measure and is a measure of how well the measuring instrument performs its function. Validity is determined by the meaningful and appropriate interpretation of the data obtained from the measuring instrument as a result of the analyses. Whiston (2012) defined validity as obtaining data that is appropriate for the intended use of the measuring instruments. Reliability refers to the stability of the measuring instrument used and its consistency over time. In other words, reliability is the ability to measure instruments to give similar results when applied at different times.

Convergent and discriminant validity are two main techniques to measure validity. Convergent validity states that the expressions related to the variables are related to each other and the factors they create, and this means that the measuring instrument designed to measure particular construct measures this intended construct correctly. In order to provide convergent Validity, AVE values must be less than the composite Reliability (CR), and each AVE value must be greater than 0.5. AVE is obtained by dividing the sum of squares of the covariance loadings of the expressions related to the factor by the number of expressions. CR, which is formulated by Werts et al. (1978), refers to the level of Reliability of the relationship between observed variables and latent variables of a measurement instrument. Another method for determining convergent validity is based on the square root value of AVE being smaller than the CR, Cronbach's alpha and AVE. In this case, it is stated that the scale provides convergent validity. The scale is considered to be reliable when the CR value is more significant than 0.70, as with the Cronbach's alpha value. In determining the convergent validity, a separate evaluation should be made for each factor construct. Discriminant validity was assessed by examining whether or not the squared roots of AVE exceed the correlations between constructs, and the reliability was evaluated by examining internal consistency reliability (ICR), as suggested by Venkataesh et al. (2003).

3.9. Chapter Summary

In this chapter, a detailed description of overall research methodology to answer the research questions, research design, and research method followed for data collection, sampling technique, data source, research technique, data collection instrument, procedure of data collection, data analysis method have been discussed. A conceptual framework is presented that

bases the diffusion of innovation, the model of innovation resistance and TOE frameworks and incorporated constructs of Cloud-Based ERP Skill, Organizational Culture, Relative Advantage, Trialability, Observability, External Pressure and Trust.

CHAPTER FOUR

DATA ANALYSIS AND PRESENTATION

4.1. Overview

This chapter deals with the analysis of data and the presentation of the result. To find the major out puts of the study and to give important recommendations, the collected data should be analyzed and discussed. Accordingly the analysis and important findings from the collected data are discussed in this chapter. Data Analysis is in short a method of putting facts and figures to solve the research problem. It is vital to finding the answers to the research questions. Another significant part of the research is the interpretation of the data, which is taken from the analysis of the data and makes inferences and draws conclusions. Often times it becomes difficult to deduce the raw data, in which case the data must be analyzed and interpret the result of the analysis (Ashirwadam, n.d).

4.2. Data Collection and Analysis Context

Out of the total 295 questionnaires shared via Google Form to ESLSE staffs that at least took training on the Oracle Cloud ERP System and privileged to access the system to perform their daily tasks at different work position and locations of the enterprise, 155 were returned. During the pre-processing step, incomplete three questionnaires with missing values and conflicting choices have been rejected. Finally, 152 responses were considered valid for further data processing that makes 51.53% valid response rate. The survey response rate has declined because the questionnaire was shared to participants through online Google form to avoid contacts and be safe from COVID 19. However, it was time demanding to remind respondent's scattered at different location of the enterprise and show them how the form can be accessed from their email, filled and submitted. Online survey questionnaires are not as such widely practiced mechanism by researchers and thus many respondents were not familiar how to attend it. So they were showing reluctance to respond in time that assumed to negatively affect the response level. Time allotted for data collection was very limited and on top this majority of the respondents were busy on their daily routines. The research participants include the ICT staffs

those who participated in the system implementation project and give assistance to the users on regular bases.

A Partial Least Square (PLS) analysis was used to test the proposed research model and hypotheses. In evaluating the factors that affecting Cloud-based ERP adoption, the Partial Least Square Structural Equation Modeling (PLS-SEM) was used and a conceptual model designed. PLS-SEM is used for causal predictive analysis and both reflective and formative variables. This method is nonparametric in nature, which means that this method does not need any supposition concerning the distribution of the data. The PLS-SEM is common multivariate analysis method to calculate variance-based structural equation models, particularly in social science and information system fields (Hussain et.al. 2018).

PLS-SEM presents an opportunity to resolve multifaceted procedure of associations and causal relationships that are otherwise hard to uncover. It handles the data to assessment the path coefficient. The most commonly used application for PLS-SEM in current era is more suitable for the analysis of quantitative data. In addition, PLS-SEM handles a distribution from the data using bootstrapping technique to find out the significance value of path coefficient. The aim of this study is to apply PLS-SEM to better understand the Cloud-based ERP adoption influencing factors.

The proposed conceptual framework is analyzed in two different stages, first the models comprises of latent variables (measurement models) that define the relationships between latent indicators and their manifest variables, and second, a structural model comprises of the relationships between the latent variables. The conceptual framework explicated the relationships between the latent variables and their related manifest variables. By using the SEM technique, a model was developed, and a total of 31 factors affecting adoption were identified from extant literature and categories into seven groups. The seven groups were called exogenous latent constructs such as the cloud-based ERP skill (ICT skill), organizational culture, relative advantage, trialability, observability, external pressure and trust. Whereas, the last endogenous latent variable (Cloud-based ERP adoption) consisted of five observed variables. The conceptual framework presenting the relationship between the exogenous latent constructs and endogenous latent constructs are exhibited in Figure 3.1 above.

Online survey was used for the data collection. Google Forms is used for the online survey. This tool is provided by Google Inc. and freely available on the web to anyone to use and create web-based questionnaires. In addition to anywhere-anytime-access, the major advantage of Google form is respondents' data is available in the format suitable for analysis (Vasanth & Harinarayana, 2016). The Google Forms records the respondent data in its spreadsheet and provide an opportunity to export in CSV formats which is compatible to SPSS and Smart PLS statistical packages. To ensure Smart PLS can import the CSV data properly, the names of those indicators (ORC1, ORC2, ORC3, ORC4, ITS1...) and Likert scale response values has been changed to numbers for the packages manipulation.

4.3. Respondents Demographic Characteristics

The demographic features of respondents used in this study comprises Educational level, Application (module) using in the system and Cloud-based ERP experience of respondents (see Table 4.1). Based on the obtained demographics information, majority (96.1%) of the respondents were work in the enterprise head office and local branch offices, 3.9 % of the study participants were from on board of enterprise vessels and Djibouti office. The highest number of respondents (69.10%) had first degree education level and most of the participants (76.3%) had from 1 to 3 years' experience in cloud-based ERP Systems. Oracle Financial Cloud service users were 30.3% from the total respondents followed by Logistics (WMS) module users 13.2%. The least number of respondents were Governance Risk & Control module users which was 3.3%.

Table 4.1. Demographic Characteristics

| Variables | Classification of Variables | Frequency | Percentage |
|-----------------------------------|--|------------------|-------------------|
| Educational Level | Secondary school | 0 | 0% |
| | Diploma degree | 8 | 5.3% |
| | First Degree | 105 | 69.1% |
| | MA/MSc Degree | 39 | 25.7% |
| Work Location in the Enterprise | Ethiopia Head office/Branch offices | 146 | 96.1% |
| | Vessel on board | 2 | 1.3% |
| | Djibouti MTS Office | 4 | 2.6% |
| Experience Using Cloud ERP System | Never | 20 | 13.2% |
| | 1-3 years | 116 | 76.3% |
| | 3-5 years | 7 | 4.6% |
| | 5-10 years | 6 | 3.9% |
| | More than 10 years | 3 | 2.0% |
| Module/Application use or support | Logistics (WMS) | 20 | 13.2% |
| | Oracle Supply Chain (Procurement & Inventory Management) | 24 | 15.8% |
| | Human Capital Management | 16 | 10.5% |
| | Governance Risk & Control | 5 | 3.3% |
| | Oracle Financial Cloud service | 46 | 30.3% |
| | Oracle Project Cloud Service | 3 | 2.0% |
| | Container Demurrage Application | 7 | 4.6% |
| | Multimodal Transport Payment Application | 14 | 9.2% |
| | Order Management | 17 | 11.2% |

4.4. Measurement Model Results

4.4.1. Reliability Test

Reliability was examined using composite reliability (CR) or Cronbach's alpha for each construct of this study. Reliability test tells whether data derived from one sample of a population would also be derived from another sample of the same population, if the same techniques and instruments were employed again (Young, 2016). Composite reliabilities in our measurement model ranged from 0.848 to 0.946 (see Table 4.2). In this cases the scores are above the recommended cutoff of 0.70 (Fornell and Larcker 1981; Nunnally and Bernstein 1994), so high levels of internal consistency reliability have been demonstrated among all reflective latent variables.

Table 4.2. Composite Reliability

| Construct | Composite Reliability |
|--------------------------|------------------------------|
| Cloud-based ERP Adoption | 0.946 |
| External Pressure | 0.941 |
| ICT Skill | 0.851 |
| Observability | 0.848 |
| Organizational Culture | 0.851 |
| Relative Advantage | 0.928 |
| Trialability | 0.867 |
| Trust | 0.863 |

4.4.2. Validity Test

Validity refers to whether the measuring instrument measures the behavior or quality it is intended to measure and is a measure of how well the measuring instrument performs its function (Anastasi and Urbina, 1997). In order to determine the validity of the measuring instrument, different types of validity have been suggested in the literature (Oluwatayo, 2012). Construct validity comprises two elements namely, convergent validity and discriminant validity. Convergent validity states that the expressions related to the variables are related to each other and the factors they create, and this means that the measuring instrument designed to measure particular construct measures this intended construct correctly (Oluwatayo, 2012). Convergent validity requires a factor loading greater than 0.70 and an AVE not less than 0.50 (Fornell and Larcker 1981). For all the constructs with multiple reflective measures, all the items having lower loadings have been removed. Thereafter, the Smart PLS is executed again and the generated results were summarized in (Table 4.3, Table 4.4 and Table 4.5) with all values above the threshold values, therefore demonstrating convergent validity.

Table 4.3. Summary for Reflective Outer Loadings

| Construct | Indicator | Outer Loadings |
|--------------------------|------------------|-----------------------|
| Cloud-based ERP Adoption | CAD1 <- CAD | 0.925 |
| | CAD2 <- CAD | 0.936 |
| | CAD3 <- CAD | 0.910 |
| ICT Skill | ITS1 <- ITS | 0.826 |
| | ITS2 <- ITS | 0.832 |
| | ITS3 <- ITS | 0.768 |
| Organizational Culture | ORC1 <- ORC | 0.705 |
| | ORC2 <- ORC | 0.729 |
| | ORC3 <- ORC | 0.806 |
| | ORC4 <- ORC | 0.826 |
| Relative Advantage | RAD1 <- RAD | 0.929 |
| | RAD2 <- RAD | 0.939 |
| | RAD3 <- RAD | 0.787 |
| | RAD4 <- RAD | 0.832 |
| Triability | TRI2 <- TRI | 0.758 |
| | TRI4 <- TRI | 0.828 |
| | TRI5 <- TRI | 0.893 |
| Observability | OBS1 <- OBS | 0.970 |
| | OBS2 <- OBS | 0.733 |
| Trust | TRU2 <- TRU | 0.892 |
| | TRU3 <- TRU | 0.734 |
| | TRU4 <- TRU | 0.838 |
| External Pressure | EXP3 <- EXP | 0.935 |
| | EXP4 <- EXP | 0.650 |

Discriminant validity is utilized to ensure whether the observed variables used in the measurement model measure the latent variable. It defines that the manifest variable in any construct is distinct from other constructs in the path model (Hussain, 2018 & Sürücü, L. &

Maslakçı, 2020). Cross-loadings and Fornell and Larcker criterion were used to evaluate and determine the discriminant validity.

1. Cross-loading of all observed variables were more than the inter-correlations of the construct of all the other observed variables in the model. Therefore, these findings confirmed the cross-loadings assessment standards and provided acceptable validation for the discriminant validity of the measurement model.

Table 4.4. Factor Structure Matrix of Loadings and Cross-loadings

| Indicators | CAD | EXP | ITS | OBS | ORC | RAD | TRI | TRU |
|-------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| CAD1 | 0.925 | 0.230 | 0.187 | 0.214 | 0.226 | 0.632 | 0.129 | 0.574 |
| CAD2 | 0.936 | 0.294 | 0.101 | 0.239 | 0.293 | 0.619 | 0.133 | 0.553 |
| CAD3 | 0.911 | 0.226 | 0.132 | 0.238 | 0.261 | 0.541 | 0.092 | 0.515 |
| EXP3 | 0.239 | 0.935 | -0.006 | 0.237 | 0.012 | 0.148 | 0.192 | 0.299 |
| EXP4 | 0.270 | 0.950 | -0.032 | 0.300 | 0.000 | 0.107 | 0.180 | 0.318 |
| ITS1 | 0.110 | -0.165 | 0.826 | 0.205 | 0.384 | 0.196 | 0.332 | 0.244 |
| ITS2 | 0.147 | 0.034 | 0.833 | 0.039 | 0.412 | 0.179 | 0.282 | 0.242 |
| ITS3 | 0.103 | 0.069 | 0.768 | 0.165 | 0.328 | 0.247 | 0.384 | 0.251 |
| OBS1 | 0.272 | 0.258 | 0.117 | 0.970 | 0.366 | 0.221 | 0.286 | 0.241 |
| OBS2 | 0.097 | 0.267 | 0.208 | 0.733 | 0.252 | 0.150 | 0.266 | 0.067 |
| ORC1 | 0.176 | -0.087 | 0.496 | 0.152 | 0.705 | 0.224 | 0.324 | 0.160 |
| ORC2 | 0.224 | -0.044 | 0.408 | 0.282 | 0.729 | 0.358 | 0.256 | 0.280 |
| ORC3 | 0.243 | 0.098 | 0.288 | 0.345 | 0.806 | 0.232 | 0.252 | 0.165 |
| ORC4 | 0.213 | 0.025 | 0.279 | 0.330 | 0.826 | 0.251 | 0.266 | 0.199 |
| RAD1 | 0.614 | 0.149 | 0.243 | 0.258 | 0.383 | 0.929 | 0.297 | 0.343 |
| RAD2 | 0.624 | 0.108 | 0.234 | 0.237 | 0.280 | 0.939 | 0.277 | 0.351 |
| RAD3 | 0.450 | 0.120 | 0.224 | 0.094 | 0.234 | 0.787 | 0.217 | 0.315 |
| RAD4 | 0.557 | 0.092 | 0.178 | 0.164 | 0.309 | 0.832 | 0.164 | 0.304 |
| TRI2 | 0.102 | 0.152 | 0.416 | 0.321 | 0.322 | 0.259 | 0.758 | 0.090 |
| TRI4 | 0.071 | 0.187 | 0.231 | 0.259 | 0.304 | 0.108 | 0.828 | 0.137 |
| TRI5 | 0.131 | 0.161 | 0.327 | 0.206 | 0.265 | 0.273 | 0.893 | 0.134 |
| TRU2 | 0.562 | 0.294 | 0.248 | 0.196 | 0.164 | 0.384 | 0.138 | 0.892 |
| TRU3 | 0.372 | 0.266 | 0.226 | 0.158 | 0.134 | 0.208 | 0.147 | 0.735 |
| TRU4 | 0.508 | 0.255 | 0.274 | 0.177 | 0.342 | 0.310 | 0.080 | 0.838 |

2. Fornell and Larcker (1981) criterion test of the model where the squared correlations were compared with the correlations from other latent constructs. Table 4.5 shows that all of the correlations were smaller relative to the squared root of average variance exerted along the diagonals, implying satisfactory discriminant validity. This proved that the

observed variables in every construct indicated the given latent variable confirming the discriminant validity of the model.

Table 4.5 AVEs, Square rooted AVEs and Correlation of latent variables

| | AVE | CAD | EXP | ITS | OBS | ORC | RAD | TRI | TRU |
|-----|-------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| CAD | 0.854 | 0.924 | | | | | | | |
| EXP | 0.888 | 0.271 | 0.942 | | | | | | |
| ITS | 0.655 | 0.151 | -0.021 | 0.809 | | | | | |
| OBS | 0.739 | 0.249 | 0.287 | 0.155 | 0.860 | | | | |
| ORC | 0.590 | 0.281 | 0.006 | 0.468 | 0.370 | 0.768 | | | |
| RAD | 0.764 | 0.648 | 0.134 | 0.251 | 0.223 | 0.348 | 0.874 | | |
| TRI | 0.686 | 0.129 | 0.197 | 0.402 | 0.309 | 0.352 | 0.276 | 0.828 | |
| TRU | 0.679 | 0.593 | 0.328 | 0.302 | 0.216 | 0.263 | 0.375 | 0.144 | 0.824 |

From the above analysis made on measurement of each constructs, this study has reached a satisfactory level regarding reliability and validity. The following section explains the next step, where the calculated case values are used as input in a set of regression equations. This method provides the way to determine parameters for structural relations. Results of the calculations are presented in the structural model.

4.5. Structural Model and Hypothesis Test

It is confirmed above that the measurement model was valid and reliable. The next step was to measure the Inner Structural Model outcomes. This incorporated observing the model's predictive relevancy and the relationships between the constructs. The Path coefficient (β value), coefficient of determination (R^2), Effect size (f^2), Predictive relevance (Q^2) and T-statistic values are the key standards for evaluating the inner structural model.

To determine statistical significance a complete bootstrapping was carried out in Smart PLS for collected sample data of 152. The bootstrap used 152 cases and 5000 subsamples. Concerning

values for the estimated path coefficients of variables, item loadings of each measurement item, and the coefficient of determination (R^2) of the other variable are significant at the 5% significance level providing strong support for the hypothesized relationships. Based on the above parameter the results of the model analysis are presented in (Table 4.6, Figure 4.1& Figure 4.2.) below.

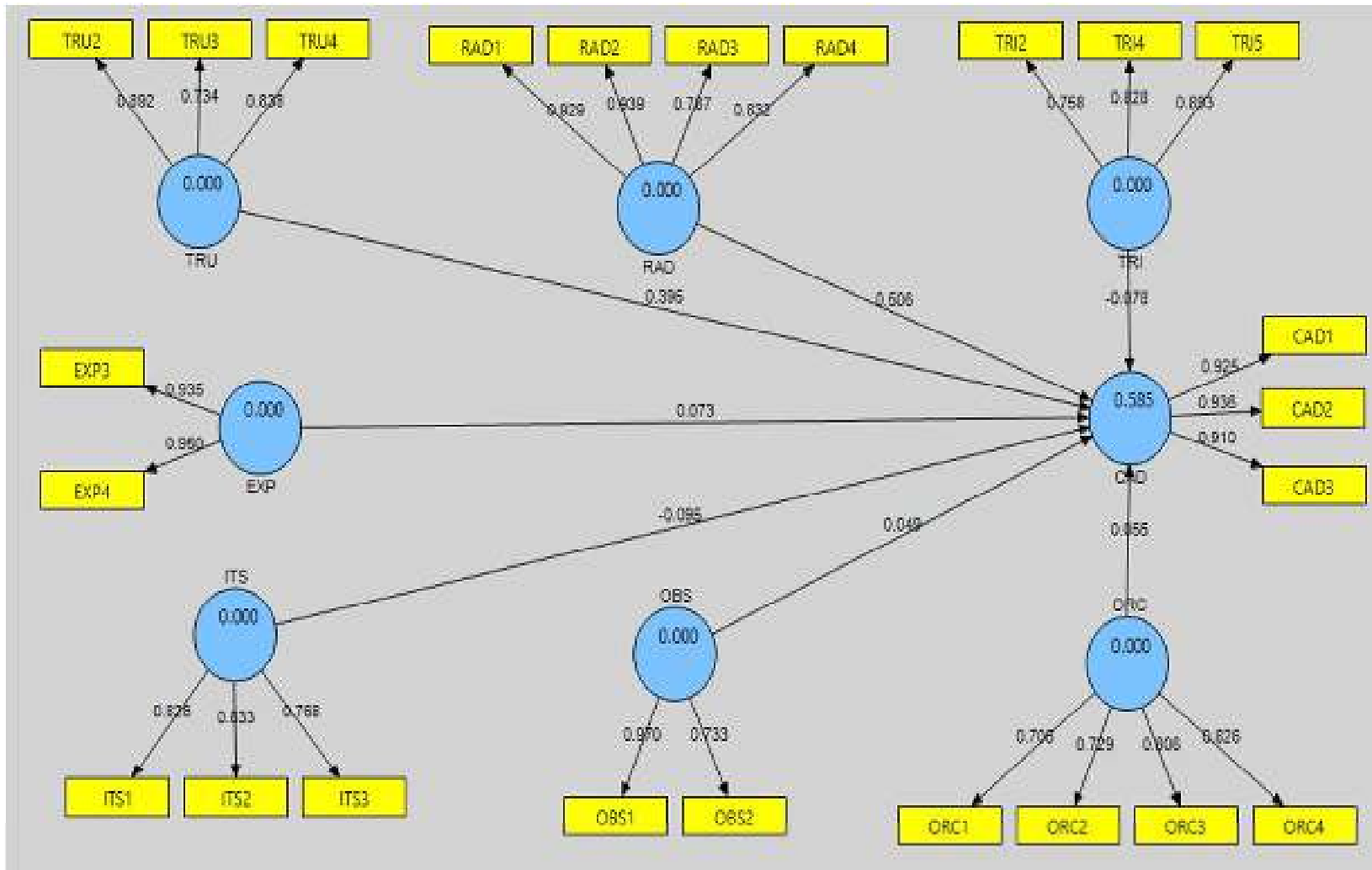


Figure 4.1. Combined Structural and Measurement Models

Table 4.6. Path coefficient and T-statistics.

| Hypothesis | Constructs | Path Coefficient | Sample Mean (M) | T Statistics (O/STDE V) | P Values | Status |
|------------|------------|------------------|-----------------|---------------------------|----------|------------------|
| H1 | ITS->CAD | 0.095 | 0.095 | 2.0662 | 0.014 | Supported |
| H2 | ORC->CAD | 0.055 | 0.055 | 1.1806 | 0.440 | Not Supported |
| H3 | RAD->CAD | 0.506 | 0.506 | 9.5946 | 0.000 | Supported |
| H4 | TRI->CAD | 0.078 | 0.078 | 1.6761 | 0.453 | Not Supported |
| H5 | OBS->CAD | 0.049 | 0.049 | 1.2181 | 0.353 | Not Supported |
| H6 | EXP->CAD | 0.073 | 0.073 | 1.9971 | 0.042 | Supported |
| H7 | TRU->CAD | 0.395 | 0.359 | 7.9734 | 0.000 | Supported |

T-values again justify the significance of relations: only relations possessing significant correlation should be taken into account (Hair et al., 2014). This study sets a limit to significance at 5%, thus, only relations exceeding 1.96 in t-values are considered significant. As indicated on Table 4.6 above, the adoption of users to accept and use cloud based ERP was impacted by relative advantage ($p=0$, or $t=9.5946$), trust ($p=0$, or $t=7.9734$), IT Skill ($p=0.014$, or $t=2.0662$) and External pressure ($p=0.042$, or $t=1.9971$). The coefficient of determination measures the overall effect size and variance explained in the endogenous construct for the structural model and is thus a measure of the model's predictive accuracy. In this study, the inner path model was 0.585 for the cloud adoption endogenous latent construct. This indicates that the seven independent constructs substantially explain 58.5% of the variance in the adoption, meaning that about 58.5% of the change in the cloud ERP adoption was due to seven latent constructs in the model. According to Henseler et al. (2009), and Hair et al. (2013), an R2 value of 0.75 is considered substantial, an R2 value of 0.50 is regarded as moderate, and an R2 value of 0.26 is considered as weak. Hence, the R2 value in this study was above moderate.

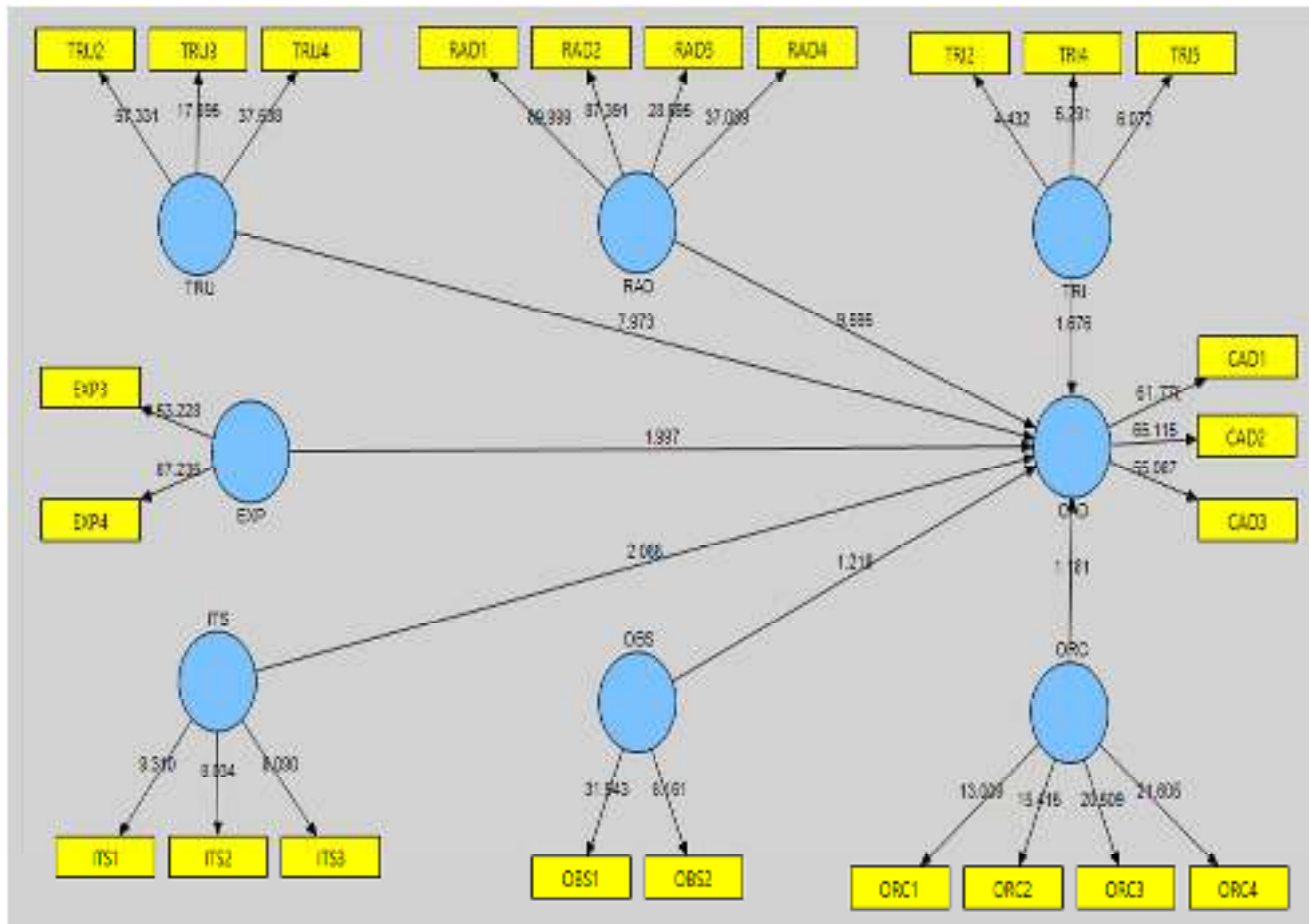


Figure 4.2. Models T statistics and bootstrapping result

Measuring the Effect Size (f^2)

The f^2 is the degree of impact of each exogenous latent construct on the endogenous latent construct. When an independent construct is deleted from the path model, it changes the value of the coefficient of determination (R^2) and defines whether the removed latent exogenous construct has a significant influence on the value of the latent endogenous construct. The f^2 values were 0.35 (strong effect), 0.15 (moderate effect), and 0.02 (weak effect) (Cohen 1998). Table 4.7 shows the f^2 from the SEM calculations. As shown in Table 4.7 below, the effect size for relative advantage, IT skill, trialability, trust, external pressure, organizational culture and observability on the adoption of Cloud based ERP system were 0.475, 0.301, 0.268, 0.265, 0.257, 0.240 and 0.194, respectively. Hence, according to Cohen's (1998) recommendation, the f^2 of all seven exogenous latent constructs on the cloud ERP adoption had a strong and moderate

effect on the value of R^2 . Furthermore, all the seven independent latent constructs in this study participated relatively to the greater R^2 value (58.5%) in the dependent variable.

Table 4.7. Effect Size.

| Exogenous Latent Variables | Effect Size f^2 | Total Effect |
|-----------------------------------|-------------------------------------|---------------------|
| Relative Advantage | 0.475 | Strong |
| IT Skill Trust | 0.301 | Moderate |
| Trialability | 0.268 | Moderate |
| Trust | 0.265 | Moderate |
| External Pressure | 0.257 | Moderate |
| Organizational Culture | 0.240 | Moderate |
| Observability | 0.194 | Moderate |

Predictive Relevance of the Model (Q^2)

Predictive relevance (Q^2) statistics are used to measure the quality of the PLS path model, which is calculated using blindfolding procedures (Hussain et.al. 2018), and cross-validated redundancy was performed. The Q^2 criterion recommends that the conceptual model can predict the endogenous latent constructs. In the SEM, the Q^2 values measured must be greater than zero for a particular endogenous latent construct. As a rule of thumb, Q^2 values higher than 0, 0.25 and 0.50 depict small, medium and large predictive relevance of the PLS-path model. Similar to the f^2 effect sizes, it is possible to compute and interpret the Q^2 effect sizes. From Figure 4.3, it shows that the Q^2 values for this study model was equal to 0.441, which was higher than the threshold limit, and supports that the path model's predictive relevance was adequate for the endogenous construct.

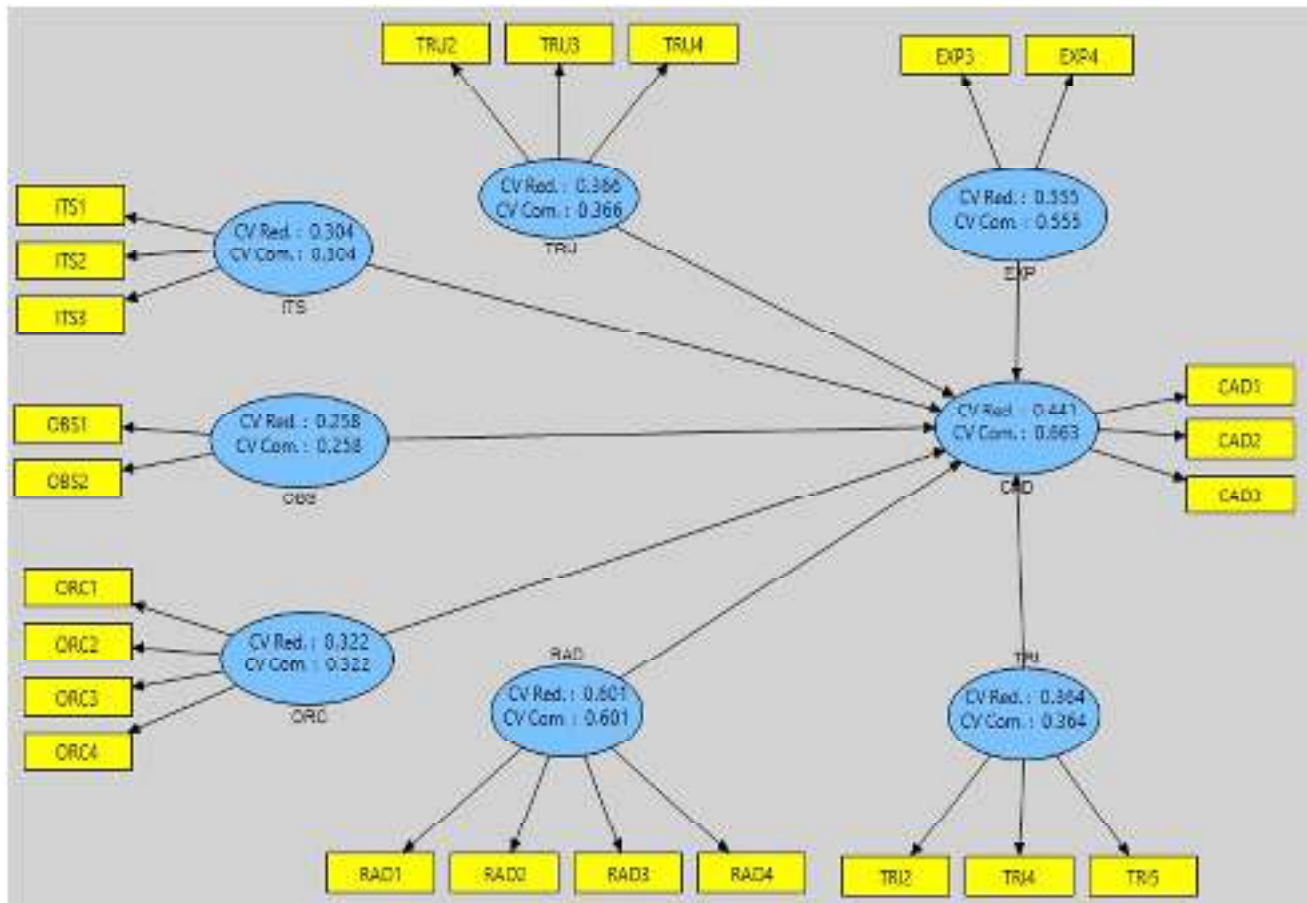


Figure 4.3. Predictive relevance of the model.

4.6. Discussion of Major Findings

The key contribution of this study was to empirically reveal the constructs that affected the cloud based ERP adoption by using the PLS-SEM technique and a closer examination of the fundamental adoption affecting constructs observed by employees of Ethiopian Shipping and logistics Services Enterprise. PLS-SEM is a very effective technique for developing and analysis of complex models, and it also validates the complex model, and social science investigators should develop latest techniques to manage more complex model relationship of their current and future studies (Hussain et.al. 2018). The conceptual paths were tested using SEM based on the PLS technique. The results of the study revealed that the relative advantage, trust, IT skill and external pressure had a significantly positive effect on cloud-ERP adoption ($R^2 = 0.585$, $p =$

0.000) and predictive relevance ($Q^2 = 0.441$). The final SEM results revealed that the system relative advantage had the highest path coefficient ($\beta = 0.506$) with the overall affecting cloud ERP adoption. Therefore, the consumers like ESLSE and service provider (ERP Vendors) should pay more attention to show relative advantage of cloud-ERP systems to improve the adoption of the application. Trust was found to be the second utmost factor ($\beta = 0.395$) of the overall factors affecting cloud ERP adoption. Among the four essential adoption influencing factors, the external pressure ($\beta = 0.073$) was found to have a minimum direct effect on the adoption, while the IT skill ($\beta = 0.095$) was found to have a moderate effect on the cloud ERP adoption. The findings of this study showed that four of the seven suggested hypotheses were supported, and the adoption of cloud based ERP adoption was affected by four constructs, i.e., relative advantage, trust, IT skill and external pressure.

Empirical results of the study revealed that the relative advantage, IT skill, external pressure and trust had a significant effect ($P < 0.05$) on cloud-based ERP adoption, while trialability, organizational culture and observability had no significant influence ($P > 0.05$) on the adoption of cloud-based ERP. Since cloud-based ERP is emerging technology in Ethiopia, ICT skill was considered to be important variables on the adoption of cloud-based ERP, accordingly the empirical result of the analysis confirmed that it is statistically significant. Therefore, ICT Skill (H1) is found supported. As for resistance characteristics, only considered construct trust is statistically valid; and organization and Innovative characteristics of organizational culture, observability and trialability, which are generally in question are insignificant.

Second organizational culture refers to the beliefs, attitudes, assumptions, norms, values and behavioral patterns of employees in the organization which either hindered or fostered their behavioral intention towards the cloud-ERP adoption. The empirical evidence of the study indicates that organizational culture has been verified not to influence ($\beta = 0.055$, $T < 1.96$) to adopt cloud ERP services, there by not supporting Hypothesis H2. The obtained result is consistent with the findings of Venkatesh et al. (2012). The result indicates that employees of ESLSE are found positively influenced by norms and values of the enterprise in the cloud ERP adoption.

Third, the study revealed that relative advantage was identified to be very important, and it shows that user's faith have to be improved that enterprise's effectiveness and efficiency can be

improved through the adoption of cloud-based ERP. It has to be confirmed that cloud ERP system can provide complete and timely information for decision making. In addition to the cost reduction contribution, this study revealed that as cloud-based ERP vendor's assertion has to get acceptance and cloud-based ERP has an advantage of quick responsiveness and flexibility to address businesses expansion and pay as much as they use. The obtained result is consistent with the findings of Ahn & Ahn (2020) which highlighted that relative advantage influenced the chief executive officers and key IT stakeholders on the cloud-based ERP adoption intention. Thus, H3 is supported because the cloud ERP adoption can be fostered by increasing user's awareness on how enterprises operational effectiveness and efficiency can be improved by using cloud-based ERP.

Forth, in this research, Trialability refers to whether the cloud ERP system can be tried out for a limited time period before an actual outlaying of the Cloud ERP service. It was hypothesized to have a significant positive effect on employees' toward cloud-based ERP adoption. From the empirical evidence shown above, trialability has been verified that this was not important factor among the innovation factors to influence ($\beta = 0.078$, $T < 1.96$) employees adoption of cloud-based ERP service. The result indicates that employees are influenced by the process playback sessions (business process demos) held before oracle cloud ERP system went going lived and the provision of trial environment for exercise. Thus, H4 is not supported.

Fifth, in this study, Observability is defined as the degree to which the results of oracle cloud ERP system is visible to the others. It was hypothesized to have a significant positive effect on Oracle's Cloud based ERP adoption (H5). But results in this study suggested that observability is not influencing ($\beta=0.049$, $P<1.96$), the adoption behavior of employees, there by not supporting Hypothesis H5. The results obtained indicate that, employees were exposed to visualize the system and its benefits.

Sixth, external pressure that influences the success of an organization in adopting new technologies includes government entities, customers, and service providers. External Pressure was hypothesized to have a significant positive effect on cloud ERP adoption (H6). The empirical evidence of the study has indicated that pressure from various stakeholders has no effects on ESLSE employees' attitude to adopt cloud ERP service with a path coefficient of 0.073 and a P value > 0.05 (or t-value >1.96) Thus, it is stand to support the H6. This suggests

that the effect of External parties' pressure on ESLSE cloud ERP adoption is statistically significant. Therefore, H6 is accepted.

Seventh, since the trust is identified as an important factor in the adoption of cloud-based ERP, it is important to building trust in and forming agreement with cloud service provider. Leadership support and follow up is important to overcome distrust from users and foster confidence to accept the system to use. The role of government is also important in forming policy and enhance telecom infrastructure since cloud-based ERP is fully dependent on the internet availability. Any concern over the quality of internet service will decrease the availability of the system by which increase distrust on the system by users. This finding aligns with findings of Estifanos (2020). Thus, H7 is supported.

4.7. Chapter Summary

In Chapter 4, the data collected from the online survey questionnaire on items affecting cloud ERP adoption, were assessed using descriptive statistics, reliability and validity analyses, factor analysis and regression analysis. Initially, how the questionnaire is shared to research attendants and the response level were described. Next, the reliability and validity of the survey questionnaire's measurements were assessed using composite reliability, factor loadings, cross loading and square root of AVE. The questionnaire demonstrated a high level of internal reliability and construct validity. Then, the research model was assessed, and the hypothesized relationships developed in Chapter 3 were tested using regression analyses. Out of seven hypotheses, H1, H3, H6 and H7 were supported. Finally, the coefficient of determination, R^2 was used to measure of the model's predictive accuracy.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

This chapter concludes the study. It presents the conclusions drawn from the findings of the study, recommendations forwarded and implications of the study.

5.1. Conclusion

This study aimed at exploring factors that affecting cloud ERP adoption in Ethiopia, in the case of Ethiopian Shipping and Logistics Services Enterprise. Therefore, the investigation aimed at answering the questions: What are key factors that affect cloud ERP adoption in Ethiopia? What are the technology adoption models and constructs considered in Cloud ERP adoption? To what extent each constructs affect cloud ERP adoption in Ethiopian Shipping and Logistics Services Enterprise? To answer these research questions, the study mainly focused on the effects of the following factors or constructs on the adoption of cloud-based ERP: Cloud ERP Skill, Organizational culture, Relative advantage, Trialability, Observability, Trust and External Pressure.

In this research, the key determinant factors that influence the adoption of cloud ERP has been examined by using the proposed research model adopted for this research combining the TOE framework, innovation characteristics, and resistance characteristics. This study was conducted based on the data gathered from employees of Ethiopian Shipping and Logistics Services Enterprise that are using Oracle cloud ERP system at head office, branch offices, on board of enterprises owned vessels and Djibouti office. Survey was conducted using self-administered questionnaire. Out of 295 questionnaires that have been distributed to customers, 152 valid questionnaires were collected and used for data analysis. The proposed conceptual model was tested using a partial least square with the help of the Smart PLS software. The proposed model explained 58.5% of variance in Cloud ERP adoption.

The empirical analysis results revealed that Relative advantage was found to be the most significant factors to positively influence cloud-based ERP adoption, followed by trust, IT skill and external pressure. This result suggests that for the adoption of cloud-based ERP, users should

perceive it as better innovation than the current system they are using and understand how it can facilitate better communication, save money and time, and lead to the efficient synchronization of new application of business ideas. To fully accept and use cloud based ERP, users should develop a lot of trust on the cloud service vendor. Clients raised concerns around trusting vendors with their mission-critical software solutions. Therefore, vendor should ensure through service level agreement (SLA) that clients/users data will be kept securely. Cloud ERP users should believe that cloud-based ERP is easy to understand and use, and they could be more skillful at using it. Therefore, it can be concluded that cloud-based ERP will be adopted and potential benefits utilized when its cost effectiveness understood and trust developed.

Conversely, organizational culture, trialability and observability are found to be insignificant to influence the adoption of cloud ERP. The result shows that for the adoption of cloud-based ERP, the influence of organization culture, triability and observability was negligible, hence study result found that organizational culture was responsive and flexible, systems was provisioned in test environment to be experimented on the limited basis and enabled employees see whether it fits organization requirements or not, user had a chance to observe the system benefits. Overall, the outcome of this study is indeed helpful to the organization planning to up-take cloud ERP services.

5.2. Recommendation

Based on the findings of the research, the following recommendations are forwarded for Ethiopian shipping and logistics services Enterprise to improve cloud-based ERP adoption by employees.

- ✓ The study indicated that relative advantage has a very high and positive impact on employees' attitudes towards the adoption of cloud ERP service. Therefore, Ethiopian shipping and logistics services Enterprise is advised to work on enhancing the awareness of employees about the relative advantage of the cloud ERP system. This could be achieved by explaining how the new system works in an integrated manner and avoid redundant tasks at different business units though it seems shifting work load to one business process as compared to old practices.

- ✓ Ethiopians Shipping and Logistics Services Enterprise could consider taking the advantage of innovative characteristics of Oracle cloud ERP in promoting the new cloud service over the existing legacy system. In particular, the enterprise should continue to work on enhancing the awareness of employees about the system's relative advantage and show how efficiency and effectiveness can be achieved by using cloud ERP system. This can be achieved by grouping employees from related business departments together and explaining how their operational activities interconnect and flow in the system and show how it becomes better of as the result of ERP shift.
- ✓ Based on the findings, trust on the vendor is a key factor affecting the adoption of cloud-based ERP. Thus, Cloud ERP service providers must work on enhancing the perceived security, reliability, and privacy of cloud ERP Services. The support from top management and IT technical personnel could contribute significantly to overcome the lack of trust and improve the adoption/acceptance of the system.
- ✓ The study indicated that trust has an impact on the employee's adoption of cloud ERP services. The complete interruption of internet connection and the low level of bandwidth can affect the trust of the users on the cloud ERP system. Therefore, Ethiopian shipping and logistics ICT Department shall assess the required minimum bandwidth required to effectively use the cloud ERP system and get assurance the connectivity at branch offices located outside meets the minimum requirements.
- ✓ It is understood that business critical applications of the enterprise has been moved to cloud service. Here the availability of the system and operation flow becomes fully dependent on the reliable internet connectivity. Therefore, the management of the enterprise should look for alternative satellite internet connectivity out let as an alternative to build better trust on the cloud service.
- ✓ Ethiopian Shipping and logistics services enterprise is advised to give continues training to employees on the ERP technologies and functionalities that will enable them to utilize the system at the expected level. Employees of the enterprise shall be encouraged to explore and use new technologies as much as possible.

- ✓ IT department of the ESLSE is advised to revise organization of its team based on the new requirement of the cloud ERP. Since major functions of the IT department outsourced to cloud service provider, IT staffs shall focus the innovation and improvement of the company's business processes.
- ✓ ESLSE advised to work on the development of qualified IT staff that can run the system and give expected level of support to the users of the cloud ERP application.
- ✓ Concerned government bodies shall give attention to ERP system implementation in the government offices and give assistance for the successful implementation. It is observed that pressure from external parties like customers, suppliers was minimal on the adoption of cloud ERP system.

5.3. Implications of the Study

Cloud ERP technology is changing rapidly and has enjoyed fast growth worldwide (AlBar and Hoque, 2017). So this study is only a milestone in a long journey, not a final conclusion. The following implications are recommended to ESLSE management, to cloud ERP users and to researchers regarding cloud ERP service to help them assess adoption factors to achieve the potential benefits promised by the system.

5.3.1. Theoretical Implication of the Research

To the best of researcher knowledge and based on review of the literature, this study is the first exploratory study that integrates DOI, MIR with TOE in determining factors influencing cloud ERP adoption in Ethiopia. It attempted to identify the significant relationship between innovation characteristics, innovation resistance and technological, organizational and environmental frameworks; and acceptance of cloud ERP in Ethiopia. This study has successfully investigated the factors that influence the adoption of cloud ERP in Ethiopian shipping and logistics services Enterprise. The effect of factors, such as relative advantage, trust, IT skill and external pressure towards cloud ERP adoption is an important topic that should be considered further in the future. The results also provide further support for the utility of the DOI, MIR and TOE in technology adoption such as cloud ERP.

5.3.2. Practical Implication of the Research

The findings of this study will facilitate the adoption of cloud ERP in both public and private organizations in Ethiopia. This study identified and analyzed the determinants of cloud ERP adoption in Ethiopia, which will help build awareness regarding the adoption of cloud ERP of the owners and investors in different sectors. This study will also help the organization leaders identify the factors that will facilitate cloud ERP adoption, as well as threats. The study will also facilitate greater acceptance and adoption and use of cloud ERP by the owners and investors of organizations for the benefit of the company. The findings can give cloud ERP vendors an insight about the factors that influence the cloud ERP adoption. Cloud ERP vendors can use the result of this study to support decision making and marketing. Thus, this study will provide the necessary support for policymakers, vendors and the government in the adoption of cloud-based ERP as well as facilitating ways of implementing the cloud ERP. Thus, the findings of this research will provide practical guidelines for the successful adoption of cloud ERP in Ethiopia and assist other developing countries in similar circumstances in the planning and up-take of cloud ERP services.

5.4. Future Research

The study was conducted to explore factors that influence the adoption of cloud-based ERP systems. As such, there are still rooms for further investigation into the adoption of cloud ERP services. The following are areas that could be considered for future research.

- ✓ From the result obtained on the analysis of the structural model, the research model demonstrates an explanation power or coefficient of determination: R^2 value of 58.5% (see chapter 4-the data analysis and presentation part of this research). The unexplained 41.5% of the overall research model indicates that some important factors influencing the adoption of cloud-based ERP may have been ignored in the research. Thus searching for additional new variables may improve the accuracy relating to the expected acceptance of cloud ERP services in the further studies.

- ✓ Understanding of the system may change over time when users have gained more experience. It may be useful to redo and re-evaluate this research and the study after a certain period of time as the results may be affected by the passage of time.
- ✓ This study attempted to measure the impact of the most salient factors in the adoption of cloud ERP rather than including a complete list of all possible influencing factors. Future research could look into other factors and examine how they can explain the impact on cloud ERP adoption.
- ✓ This study was conducted in Ethiopian Shipping and Logistics Services Enterprise, the findings of which cannot represent the overall situation of the country, Ethiopia. Further research should be done to collect data from different public and private enterprises in the country.

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APPENDIX

ተግባራዊነት ቢኒያም ፍቃዱ ነው። ይህ ቅሬታ የተዘጋጀው ስለዚህ ጥናት ስለርስዎ ለማሳወቅ ነው።

ዓላማው ምን ድን ነው?

በዚህ ጥናት ውስጥ ዘከላው ድ.ኢ.አር.ፒ. ስርዓቶች ተቀባይነት ላይ ተጨማሪ የሚያሳድሩ ጉዳዮች ተመርገዋል። ፖስታዎቹ ከተመረመሩ በኋላ ተጠቃሚዎች በከፊት ድ.ኢ.አር.ፒ. ስርዓቶችን ተቀብሎ ተግባራዊ ከማድረግ ጋር የተዛመደ ሞዴል ለማዘጋጀት የታለመ ነው።

አገልግሎት የሚገልግል ገባዎች ማንነታችሁ?

በጥናቱ ሂደት ውስጥ ለመተሳተፍ ከተሰማሙ በርካታ ምርጫዎችን ያካተተ መጠይቅ እንዲሞሉ አገልግሎት ለገጽ 20 ደቂቃ ያዘል ይጠሰዳል ተብሎ ይጠበቃል።

ከእርስዎ ያገኘናቸውን መረጃዎች እንዴት እንጠቀማለን?

ተሳትፎዎ ሙሉ በሙሉ በይዘታዎን ላይ የመሰረተ ነው። እናም እንደ ሰው ምንም አይነት ጠጠት ላያስከትልበት ዘግንኛለን። ጊዜ ለጊዜዎች መልስ መስጠቱን ማቆም ይችላል። ከግንኙነት ወይም ከሰራተኛ ቦታ ጋር የሚዛመድ ማንኛውንም መረጃ እንዲያጋሩ እንጠይቃለን። የእርስዎ መልስ በሚሰጥሮ የተጠበቁ ይሆናሉ እናም እነሱ በጥናት እከናዎቻችን ብቻ ይገመገማሉ። የተገኘው መረጃ ዘጠቅላላው ይገመገምና በሰነድ ላይ ይረጃ ሊታተም ይችላል።

ማዕቅ ያለብዎት ነገር።

ስጥቀሙ መልስ ሰጪዎች ምንም የተተነበዩ አደጋዎች የሌሉም። ተሳትፎዎ ሙሉ በሙሉ በፍቃድ ነት የተመሰረተ ሲሆን እንደ ሰው መጠየቁን በተጥታ በመዘጋት ጥያቄዎችን በማንኛውም ጊዜ መመለሱን ማቆም ይችላል።

ስለ ከላው ድ.ኢ.አር.ፒ ስርዓቶች

በዚህ ምርመራ አውድ ውስጥ የከላው ድ.ኢ.አር.ፒ ስርዓት እርስዎ በርሳዎች የተዘጋጁ የመረጃ ስርዓቶች ቅንጅት ለሆን የድርጅቱን የተለያዩ የስራ ክፍሎች የሚያገናኝና በተመጣጣይ ጊዜም የመረጃ ትይዘር እንዲያደርጉ የሚያስችል ስርዓት ነው ተብሎ ሊገለጽ ይችላል። በተጨማሪም ይኒሳው ድ.ኢ.አር.ፒ ስርዓት የኢንተርኔት አገልግሎት ባለበት ዘግንኛለን ጊዜና ቦታ መጠቀም የሚቻል ይሆናል። የከላው ድ.ኢ.አር.ፒ ስርዓት የፋይናንስ ጥሰው ሃይል አስተዳደርና ልማትን ግዢና ንብረት አስተዳደርን ሽያጭን ጥንቅቅን ስራዎችን ከሌሎች የሙሉ ጥገና ላይ ይጠቀማል።

* Required

1. 1. What is your level of education? (የትምህርት ደረጃዎ/ሽ ምን ድንጋግ?) *

Mark only one oval.

- a. High school graduate (የከፍተኛ ትምህርት ምዕታ)
- b. Diploma degree (ዲፕሎማ ዲግሪ)
- c. Bachelor's degree(ባችለር ዲግሪ)
- d. Master's degree or more (ማስተርስ ዲግሪ እና በላይ)

2. 2. Choose the location of the Enterprise you are working in? (የምትሰራበትን/ረቦትን የድርጅት መገኛ ስፍራ ምረጥ/ጩ) *

Mark only one oval.

- a. Ethiopia Head office / Branch offices. (የኢትዮጵያ ዋና መስሪያ ቤት/ ቅርንጫፍ መስሪያ ቤቶች)
- b. Vessel on board (መርከበኛ)
- c. Djibouti MT's office (ጅቡቲ ኤምቲኤስ መስሪያ ቤት)

3. 3. How long have you been using Cloud based ERP system?(የከላውድ መስሪያ ያለው የኢ.አር.ፒ ስርዓትን መጠቀም ከጀመርኩ/ሽ ምን ያህል ጊዜ ሆነዎ/ሽ) *

Mark only one oval.

- a. I have never used cloud ERP systems before. (የኢ.አር.ፒ ኮሎውድ ስርዓትን ከዚህ በፊት ተጠቅሜ አላሁትም)
- b. 1-3 years(1-3 አመታት)
- c. 3-5 years(3-5 አመታት)
- d. 5-10 years(5-10 አመታት)
- e. More than 10 years(10 አመት በላይ)

4. Select the ERP module/Application you are currently using/Supporting: (አዎን ላይ እየተጠቀሱት/የሚጠቀሱትን የሊ.አ.ር. ሲ. ስርዓት መተግበሪያ ያረጩ) *

Mark only one oval

- a) Logistics (WMS) (የጀስቲስ (ደብዳቤ ለምሳሌ))
- b) Oracle Supply Chain (Procurement & Inventory Management) (የሊ.ሪ.ኤል. አቅርቦት/የገቢ እና ንብረት አስተዳደር)
- c) Human Capital Management (የሰው ሀብት አስተዳደር)
- d) Governance Risk & Control (የአስተዳደር አደጋ እና ብቁነት)
- e) Oracle Financial Cloud service(የሊ.ሪ.ኤል. የፋይናንስ ክፍል አገልግሎት)
- f) Oracle Project Cloud Service (የሊ.ሪ.ኤል. ፕሮጀክት ስግግር አገልግሎት)
- g) Container Demurrage Application(የኮንቲኔር ዲሜሪድ መተግበሪያ)
- h) Multimodal Transport Payment Application(መልቲሞድል የትራንስፖርት መክፈያ መተግበሪያ)
- i) Order Management (አርደር ማእዘን)

5. Scale: 1 – Strongly Disagree, 2 – Disagree, 3 – Neutral, 4 – Agree, 5 – Strongly Agree
1-ፈጽሞ አልሰማም, 2-አልሰማም, 3- ባለልተኛ ነኝ, 4-አሰማለሁ 5-ፈጽሞ አሰማለሁ

7. Organizational Culture - ድርጅታዊ ባህሪ *

Check all that apply.

| | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 6. Our company is responsive and flexible in adopting cloud-based ERP. (ድርጅታችን ክፍለ-ጊዜ ለ.አር.ፒን ዘመቀበል ረገድ ምላሽ ስለገና ያቀጣጥባል።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. There is a high level of agreement about how we operate in this company. (ድርጅታችን ጭሰታ ስራዎችን ለንግድ ማከናወን ለንግድብን ክፍለ-ጊዜ የሚቀጥብ ስራ ስለሌለ።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Our company has an open and receptive organizational culture in adopting cloud-based ERP. (ድርጅታችን ዘመቀ-ጊዜ ለ.አር.ፒን ለመቀበል ክፍት የሆነና አዳል ነገርን የሚቀበል ድርጅታዊ ባህሪ አለው።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Our company has an organizational culture suitable for cloud-based ERP adoption. (ድርጅታችን ዘመቀ-ጊዜ ለ.አር.ፒን ለመቀበል የሚገባ ምላሽ ድርጅታዊ ባህሪ አለው።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

8. Relative Advantage-አንጻራዊ ተቃታኝነት

Check all that apply

| | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 10. Cloud-based ERP will enhance the efficiency of our company. (የክፍለ ወይዘት ሊ.አር.ፒ የድርጅታችንን ውጤታማነት ያሻሽላል።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Cloud-based ERP will improve the performance of our company. (ክፍለ ወይዘት ሊ.አር.ፒ የድርጅታችንን ዕንጻዥ ያሻሽላል።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. Cloud-based ERP will provide timely information for decision making. (ክፍለ ወይዘት ሊ.አር.ፒ ወሳኝ ስራዎች ለማድረግ ጊዜ ላይ ያስገኛል።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. With cloud-based ERP adoption, we expect to see cost savings effect. (ክፍለ ወይዘት ሊ.አር.ፒን መጠቀም ለውጭ የሚጠበቅ ደንበኞችን ለማስጠበቅ ይረዳል።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. With cloud-based ERP adoption, we will be able to respond quickly and flexibly to our business expansion and pay only for what we use. (ክፍለ ወይዘት ሊ.አር.ፒን መጠቀም ለውጭ ስተላኖች ለገደብ ለማስጠበቅ ይረዳል።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |



9. Complexity - ልዩ-በስብስብነት *

Check all that apply

| | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 15. We believe that cloud-based ERP is difficult to use. (ከሎይ አ.አር.ፒ ለአጠቃቀም አስቸጋሪ ነው ብልን እናምናለን።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 16. Integrating cloud-based ERP in our work practices will be difficult. (ከሎይ አ.አር.ፒ ን ከአሰራር ልማቶቻችን ጋር ግንባታ አስቸጋሪ ይኖራል።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 17. Our company may encounter some difficulties in maintaining the cloud-based ERP platform. (ድርጅታችን ከሎይ አ.አር.ፒን ይዞ ለመተግበር አንዳንድ አስቸጋሪ ዕድገቶች ሊገጥሙት ይችላሉ።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 18. Cloud-based ERP is complex to use. (ከሎይ አ.አር.ፒ ለአጠቃቀም ልዩ-በስብስብ ነው።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 19. Our company is expected to have a long stabilization period for stable use after cloud based ERP adoption. (ድርጅታችን ከሎይ አ.አር.ፒ በላምታ ለመጠቀም ረዘም ያለ የማረጋገጫ ጊዜ ያስፈልጋል።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

12. Data Security - የመረጃ ደህንነት *

Check all that apply.

| | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 29. There are poor data protection practices adopted by companies and cloud vendors. (በኩሎም ድ.ረ.ጅ.ጅ.ጅ የጠቃሚዎችና አገልግሎት ስልጠናዎች ስንድ ዝቅተኛ የመረጃ ጥበቃ ልምቶች አሉ።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 30. We have seen unauthorized data access occurred in various companies. (የደንበኞች ድርጅቶች መረጃ ባልተፈቀደላቸው አካላት ጣልቃ ገብነት ሲፈጸምበት አይቻልም።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 31. We have seen unauthorized data access occurred in cloud providers. (የኩሎም አገልግሎት አቅራቢ ድርጅቶች መረጃ ባልተፈቀደላቸው አካላት ጣልቃ ገብነት ሲፈጸምበት አይቻልም።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 32. Cloud-based ERP's data security is a concern because it is unclear where the data storage is located. (የመረጃ ጥበቃን የሚያስፈልግ የልዩ ባለመሆኑ ምክንያት የኩሎም ድ.ረ.ጅ.ጅ.ጅ መረጃ ደህንነት ያሳስበኛል።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 33. We are concerned about the privacy of sensitive data held by our company due to inconsistent data protection laws. (በግንደጣጣሙ የመረጃ ጥበቃ ስንድ ማንኛውንም ስርዓቶችን በተያዘ ግብዓቶች መረጃዎች ደህንነት ያሳስበኛል።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

13. Vendor Lock-in- በሻዎቹ ቁጥጥር ስር መሆን ል

Check all that apply

| | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 34. We can experience variance in the service quality of different cloud vendors. (የተለያዩ የክላውድ አገልግሎት አቅራቢዎችን የአገልግሎት ጥራት ልዩነትን ግኛት እንችላለን።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 35. We can face the high cost of ERP re-migration after using cloud-based ERP. (አንድን ክላውድ አ.አር.ፒን መለቀጥ ከተሻመረ ዘመን በኋላ አ.አር.ፒ መተየር ከፍተኛ መጠን ያስጠጣል።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 36. It would be very difficult to change a cloud vendor due to legal and contractual restrictions. (በሆኖ ሁለት ገደቦች ምክንያት የክላውድ አ.አር.ፒ አቅራቢ ድርጅትን በተላላ መተየር ያስቸግራል።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 37. When adopting a cloud-based ERP of a specific vendor, it is unavoidable to accept the guidelines of the vendor even if it is unreasonable. (የአንድን የክላውድ አ.አር.ፒ ድርጅትን አገልግሎት ለማስተም፣ ምክንያታዊ በይዘትም የአቅራቢውን መመሪያ መቀበል ግድ ይሆንብናል።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 38. After adopting a cloud-based ERP of a specific vendor, there is no choice but to follow the product roadmap of the vendor. (የአንድን የክላውድ አ.አር.ፒ አቅራቢ ድርጅትን አገልግሎት መስጠት ከጀመርን በኋላ።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

14. Customization- ግበጆን/መቻላት *

Check all that apply:

| | Strongly disagree | Disagree | Neutral | Agree | Strongly Agree |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 39. We have customization limitations on cloud-based ERP. (የክፍት ሊ.አር.ፒን አሰራር ከድርጅቶችን አሰራር አንጻር የመቻላት መቅናቀስ አልተገኘም።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 40. The customization ability of cloud based ERP is very limited. (የክፍት ሊ.አር.ፒ አንዳስግግሮ ሆኖ አንዳያገለግል የመቻላት ሃሳብ ታላቅ ስግግር መሰጠት ነው።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 41. We believe it is not easy to migrate to cloud-based ERP due to heavy customization. (ከባድ የግስግሚያ የመቻላት ስራ የሚዘጋጅ ይመስለኝ። ወይ ከፋውድ ሊ.አር.ፒ መሸጋገር ቀላል አይደለም።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 42. Developing custom code in cloud-based ERP is expensive. (ከፋውድ ሊ.አር.ፒ ላይ ግስግሚያ የግስግሚያ የኮምፒዩተር ንግድ መገኛ ሙያ ነው።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 43. It is not easy to develop with custom code after cloud-based ERP adoption. (ከፋውድ ሊ.አር.ፒን መጠቀም ከጀመርን በኋላ ግስግሚያ መገኛ የኮምፒዩተር ንግድ መገኛ ቀላል አይደለም።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

15. Trust - አምናት *

Check all that apply.

| | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 44. The Cloud based ERP service provider is trustworthy. (የከፋውድ ኢ.አር.ፒ አገልግሎትን የግለሰብ ድርጅት አምናት የሚባልበት ነው።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 45. I believe Cloud based ERP service is reliable. (የከፋውድ ኢ.አር.ፒ አገልግሎት አስተማማኝ ነው ብዬ አምናለሁ።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 46. I feel secure sharing sensitive information across the Cloud based ERP system. (በከፋውድ ኢ.አር.ፒ ተቆይተው ረጅም ጊዜ ለሌሎች ልቦና ጽንገት ይሰጥኛል።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 47. Cloud based ERP system is safe for me. (ከከፋውድ ኢ.አር.ፒ ለእኔ ይህን ሆኖ አግኝቻለሁ።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

16. External Pressure- ጠቅላይ ጥገና ተጽእኖ *

Check all that apply.

| | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 48. The government policy has a positive impact on cloud based ERP adoption. (ክፍለ- ሊ. ሊ. ፒን ከመቀበል/ከመጠቀም አገጥሞ የመጣ ጥገና ለውጥ ተጽእኖ አለው።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 49. The government drives the use of cloud ERP through incentive programs. (መንግስት የሰነድ ሊ. ሊ. ፒ ተጠቃሚነት ለማስፋፋት የተለያዩ ግብር-ታዳሾችን ያደርጋል።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 50. There was request from enterprise Customers to use Cloud based ERP service. (ድርጅቱ ክፍለ- ሊ. ሊ. ፒን እንዲጠቀም ይጠይቅ ለውጥ ይቀርባል።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 51. There was demand from enterprise Suppliers to use Cloud based ERP service. (ድርጅቱ ክፍለ- ሊ. ሊ. ፒን እንዲጠቀም ይጠይቅ ለውጥ ይቀርባል።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

17. Cloud-based ERP Adoption -ክፍሎ ድረስ ለሊረገግ ተቀባይነት

Check all that apply

| | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 52. We strongly intend to use cloud-based ERP in our company. (ድርጅታችን ክፍሎ ድረስ ለሊረገግ እንዲጠቀም እንቀብታለን ለንባልን።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 53. We like the idea of using cloud-based ERP systems. (ክፍሎ ድረስ ለሊረገግ ሲባቸው የመጠቀም ፀሐፊን እንወደዳለን።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 54. Overall, we have a favorable attitude toward cloud-based ERP implementation. (በቅድሚያ የክፍሎ ድረስ ለሊረገግ ትግበራን በግመልክት መልካም አመለካከት አለን።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 55. Our company is deeply discussing the adoption of cloud-based ERP. (ድርጅታችን ክፍሎ ድረስ ለሊረገግ ለመጠቀም ፀረያ ሰፈራዊ ደረጃ ሊኖር ይችላል።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 56. Our company is preparing for the adoption of cloud-based ERP. (ድርጅታችን ክፍሎ ድረስ ለሊረገግ ለመጠቀም ዝግጅት ሊኖር ይችላል።) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

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ግዕዝ ያለብዎት ነገር

ለጥያቄው መልስ ሰጭዎች ምንም የተተነበዩ አደጋዎች የሉም። ተሳትፎዎች ሙሉ በሙሉ በፍቃደኝነት የተመሰረተ ሲሆን እንደ ሰው መጠየቁን በየጥታ በመዘጋት ጥያቄዎችን በማንኛውም ጊዜ መመለሱን ግብዓት ይችላል።

ልዩ ክፍል ሊ.አር.ፒ ስርዓተቶች

በዚህ ፖርፖዘት አወድ ጸሁፍ፣ የክፍል ሊ.አር.ፒ ስርዓት አርስ በርሳቸው የተጠቀሱ የመረጃ ስርዓቶች ትንደት ሲሆን የድርጅቱን የተለያዩ የሰራ ክፍሎች የሚያገናኝ፣ በተመጣጣይ ጊዜም የመረጃ ቅይዘት እንዲያደርጉ የሚያስችል ስርዓት ነው ተብሎ ሊገለፅ ይችላል። በተጨማሪም የክፍል ሊ.አር.ፒ ስርዓት የኢንተርኔት አልግሎት ባለበት በማንኛውም ጊዜና ቦታ መጠየቅ የሚቻል ይሆናል።

የክፍል ሊ.አር.ፒ ስርዓት የፋይናንስ፣ የሰው ሃይል አስተዳደርና ልማት፣ ገዢና ገብርት አስተዳደር፣ ሽያጭ፣ የትራንስፖርት ክፍያና የመሳሰሉ ሞዴሎችን ይጨምራል።

(የግል መረጃ)

1. የትምህርት ደረጃዎ/ሽ ምንድነው?

- ሀ. የከፍተኛ ትምህርት ምሩቅ
- ለ. ቢፐሎ-ማ ዲግሪ
- ሐ. ባችለር ዲግሪ
- መ. ማስተርስ ዲግሪ እና በላይ

2. የምትሰሩበት/ሪቦትን የድርጅት መገኛ ስፍራ ምንድን ነው?

ሀ. የኢትዮጵያ ሞና መስሪያ ቤት/ ቅርንጫፍ መስሪያ ቤቶች

የግል መረጃ
 ተጠቃሚው ስም
 Tassebachew Dagnaw
 አድራሻ
 Addis Ababa
 የግል መረጃ



ሰ. መርከበኛ

ሐ. ጅቡቲ፣ ኢምፕሪያል መሰሪያ ቤት

3. የክላውድ መሰረት ያለው የኢ.አር.ፒ ስርአትን መጠቀም ከጀመርኩሽ ምን ያህል ጊዜ ሆነህ/ሽ

ሀ. የኢ.አር.ፒ ክላውድ ስርአትን ከቢህ በፊት ተጠቅሜ አላውቅም

ለ. ከ1-3 አመታት

ሐ. ከ3-5 አመታት

መ. ከ5-10 አመታት

ሠ. ከ10 አመት በላይ

4. አሁን ላይ እየተጠቀሙባቸው / እየደገፋችሁ ያላችሁትን የኢ.አር.ፒ ሞዳል መተግበሪያ ምረቡ

ሀ. ሎጀስቲክ (ደብዳቤው ኢም አስ)

ለ. የኦሪ-ክል አቅርቦት (ግዢ እና ንብረት አስተዳደር)

ሐ. የሰው ሀብት አስተዳደር

መ. የአስተዳደር ልደጋ እና ቁጥጥር

ሠ. የኦሪ-ክል የፋይናንስ ክላውድ አገልግሎት

ረ. የኦሪ-ክል ፕሮጀክት ክላውድ አገልግሎት

ሰ. የገንዘብ ሂሳብ መተግበሪያ

ሸ. መልቲሞዲያ የትራንስፖርት መክፈያ መተግበሪያ

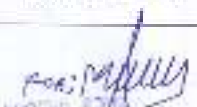
ቀ. አር.ደ.ሮ ማክጅመንት

የግዴታ ማረጋገጫ
የግዴታ ማረጋገጫ
የግዴታ ማረጋገጫ
የግዴታ ማረጋገጫ
የግዴታ ማረጋገጫ



ከዚህ በታች ያሉት ጥያቄዎች ክፍውድን መሰረት ስላደረገው የኢ.አር.ፒ ተከናውኗል ያልሆነን ምልክታ ለማወቅ ነው። ስቡሉም ጥያቄዎች መልሶቹ ከ1 እስከ 5 ደረጃ ተሰጥቷቸዋል። እና እያንዳንዱ የደረጃ ትርጓሜ ምን ማለት እንደሆነ ከዚህ በታች ተሰጥቷል።

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1- ፈጽሞ አልሰማንም, 2- ከልሰማንም, 3- ገለልተኛን, 4- አስማንለሁ, 5- ፈጽሞ አስማንለሁ | | | | | |
| የክፍውድ ኢ.አር.ፒ ክህሎት (የአያ.ሲ.ቲ ክህሎት) | | | | | |
| 1. የድርጅታችን ለራተኞች ክፍውድ ኢ.አር.ፒ ላይ በቱ ስልጠና አካላቸዋል። | | | | | |
| 2. ድርጅታችን በሙያው በልዩ ሁኔታ በሰልጠኝነት እውቀት ባለው የክፍውድ ኢ.አር.ፒ ባለሙያ ድጋፍ ያገኛል። | | | | | |
| 3. የድርጅታችን ሰራተኞች አዳዲስ ተከናውኪዎች ላይ ክፍውድ ኢ.አር.ፒን ጨምሮ ስልጠና እንዲያገኙ በቲ እድል ተመዘኛቸዋል። | | | | | |
| 4. የድርጅታችን ሰራተኞች አዳዲስ ተከናውኪዎች ላይ ክፍውድ ኢ.አር.ፒን ጨምሮ ስልጠና ለመረጣት አላቸው። | | | | | |
| 5. የድርጅታችን ሰራተኞች የክፍውድ ኢ.አር.ፒ አስፈሪ ዜጋዎች ግንባቢ አላቸው። | | | | | |
| ድርጅታዊ ባህል | | | | | |
| 6. ድርጅታችን ክፍውድ ኢ.አር.ፒን በመቀበል ረገድ ምላሽ ሰጪና የተመዘኛ ነው። | | | | | |
| 7. ድርጅታችን ውስጥ ስራዎችን እንደታ ማከናወን እንደሌለን ክፍ ያለ የጋራ መስማማት አለ። | | | | | |
| 8. ድርጅታችን ክፍውድ ኢ.አር.ፒን በመቀበል ክፍት የሆነና አዳስ ነገርን የሚቀበል ድርጅታዊ ባህል አለው። | | | | | |
| 9. ድርጅታችን የክፍውድ ኢ.አር.ፒን በመቀበል የሚሆን ምን ድርጅታዊ ባህል አለው። | | | | | |
| አንጻራዊ ጥቅም | | | | | |
| 10. ክፍውድ ኢ.አር.ፒ የድርጅታችንን ውጤታማነት ያሻሻላል። | | | | | |
| 11. ክፍውድ ኢ.አር.ፒ የድርጅታችንን ክግዥ ያሻሻላል። | | | | | |
| 12. ክፍውድ ኢ.አር.ፒ ውሳኔ መስጠት የሚያስችል፣ ወቅቱን የጠበቀ መረጃ ማቅረብ ይችላል። | | | | | |

For: 
 Tsigeachew Daynew
 አርአዲስ ተወዋይ
 ፎርደም & ፕላንናክሪንግ



| | | | | |
|---|--|--|--|--|
| 13. ክላውድ ኢ.አር.ፒን መጠቀም፡ ወርቢን የሚቆጥብ ውጤት ይኖረዋል ብለን እንጠቁቃለን። | | | | |
| 14. ክላውድ ኢ.አር.ፒን መጠቀሚያን፡ ለተለያዮቹ ተኔታዎች ላይ ፈጣን ምላሽ መስጠትን፣ የንግድ ስራዎችን ማስፋፋትና ፡ ዘተጠቀምንው ልክ ብቻ እንድንከፋል ያስችለናል። | | | | |
| ውስጠስጠት | | | | |
| 15. ክላውድ ኢ.አር.ፒ ለአጠቃቀም እስኪገደድ ነው ብለን እናምናለን። | | | | |
| 16. ክላውድ ኢ.አር.ፒን ከአሰራር ልማቶቻችን ጋር ማቀናጀት እስኪገደድ ይቻላል። | | | | |
| 17. ድርጅታችን ክላውድ ኢ.አር.ፒን ይዞ ለመቀጠል እንዳንድ እስኪገደድ ተኔታዎች ሊገኙሙት ይችላሉ። | | | | |
| 18. ክላውድ ኢ.አር.ፒ ለአጠቃቀም ውስጠስጠብ ነው ። | | | | |
| 19. ድርጅታችን ክላውድ ኢ.አር.ፒ በአግባቡ ለመጠቀም ረዘም ያለ የሚረገገ ዚዩ ያስፈልገዋል። | | | | |
| ተሞካሪነት | | | | |
| 20. ድርጅቱ ክላውድ ኢ.አር.ፒ ለመጠቀም ከመጨረሻ እስከቀድሞ ሲስተሙ ላይ ሙከራዎችን አድርጎልኑ። | | | | |
| 21. የክላውድ ኢ.አር.ፒ አገልግሎትን ከመክራ ያረጃ በቀ ጊዜ ተጠባይ እንድንጠቀምና ፡ እንዲሁም ከድርጅቱ ጋር እንዴት እንደሚሰማግ እንድንረዳ ተጻርጎል። | | | | |
| 22. ክላውድ ኢ.አር.ፒን ስጠቀም የሚገባበቱ ስህተቶችን ማረም ቀላል ነው። | | | | |
| 23. ክላውድ ኢ.አር.ፒን ከመተዘል እስከቀድሞ፡ የድርጅቱ ፍላጎቶች መስተታቸውን ማረጋገጥ ተቻሏል። | | | | |
| 24. ክላውድ ኢ.አር.ፒን ከመተዘል እስከቀድሞ፡ የድርጅቱ ተጨማሪ ፍላጎቶች ማጠቃለያ ተቻሏል። | | | | |
| ተስተዋደንት | | | | |
| 25. የድርጅቱ አገሮች ከክላውድ ኢ.አር.ፒ ያገኙትን ጥቅም በተገልጹ ማስተዋል ይቻላል። | | | | |
| 26. ብዙዎቹ የድርጅታችን አገሮች ክላውድ ኢ.አር.ፒን ሲጠቀሙ አይተናገድም። | | | | |
| 27. በተመሳሳይ ዘርፍ የሚገኙ ድርጅቶች ክላውድ ኢ.አር.ፒን ሲጠቀሙ ተስተውለዋል። | | | | |
| 28. ተመሳሳይ መጠን ያላቸው ስራዎች ድርጅቶች ክላውድ ኢ.አር.ፒን አየተጠቀሙ እንደሆነ ተሰታውሏል። | | | | |

FOR: 
 አብዛኛ ላይ
 Technology Division
 MOFAS ተርጉም
 Education & Training
 አብዛኛ ላይ



| የመረጃ ደረጃ | | | | | |
|--|--|--|--|--|--|
| 29. የክልሉ ኢ.አር.ፒ ተቤቶች ለአገልግሎት ሰጪዎች ዘንድ ዝቅተኛ የመረጃ ጥበቃ ልምዶች አሉ። | | | | | |
| 30. የደንበኛ ድርጅቶች መረጃ ዛልተፈቀደላቸው አካላት ጣልቃ ገብነት ሊፈጸምባት አይችሉም። | | | | | |
| 31. የክልሉ አገልግሎት አቅራቢ ድርጅቶች መረጃ ዛልተፈቀደላቸው አካላት ጣልቃ ገብነት ሊፈጸምባት አይችሉም። | | | | | |
| 32. የመረጃ ማስማማት ዐታው ግልጽ ዛልመሆኑ ምክንያት የክልሉ ኢ.አር.ፒ መረጃ ደረጃ ያሳስባል። | | | | | |
| 33. በማህበረሰቡ የመረጃ ጥበቃ ሀገራት ምክንያት፣ በድርጅቶች በተጣጡ ሚስጥራዊ መረጃዎች ደረጃ ያሳስባል። | | | | | |
| ዘጠኝ ቁጥጥር ስር መዋል | | | | | |
| 34. የተለያዩ የክልሉ አገልግሎት አቅራቢዎች የአገልግሎት ጥራት ልዩነት ማየት አንችላለን። | | | | | |
| 35. አንድን ክልሉ ኢ.አር.ፒን መጠየግ ከተጀመረ በኋላ፣ በልላ ኢ.አር.ፒ መቀየር ከፍተኛ ጠቂቅ ያስመጣል። | | | | | |
| 36. በሀገሩ በውል ገደቦች ምክንያት የክልሉ ኢ.አር.ፒ አቅራቢ ድርጅትን ዘቅላሎ መቀየር ያስቸግራል። | | | | | |
| 37. የአንድን የተወሰነ የክልሉ ኢ.አር.ፒ አቅራቢ ድርጅትን አገልግሎት ስንጠቀም፣ ምክንያታዊ በይዘቱም የአቅራቢውን መመሪያ መቀበል ግድ ይሆንብናል። | | | | | |
| 38. የአንድን የክልሉ ኢ.አር.ፒ አቅራቢ ድርጅትን አገልግሎት መጠየግ ከጀመርን በኋላ፣ የአቅራቢውን ድርጅት የአገልግሎት ጥናት ካርታ ከመክተል ጠቃሚ ለሌላ ምርጫ የለንም። | | | | | |
| ማጠቃለያ/ መቃኘት | | | | | |
| 39. የክልሉ ኢ.አር.ፒን ለሰራተኛ ሰራተኛዎች ለሰራተኛ አገልግሎት የመቃኘት ውስጥ አለብን። | | | | | |
| 40. የክልሉ ኢ.አር.ፒ ተስማሚ ሆኖ አንዲያገለግል የመቃኘት ችሎታው ዘላቂ ውስን ነው። | | | | | |
| 41. ከዘዴ የማስማማትና የመቃኘት ስራ የሚጠይቅ ዘመድ፣ ጠቃሚ የክልሉ ኢ.አር.ፒ መሻገር ተገቢ አይደለም። | | | | | |
| 42. ክልሉ ኢ.አር.ፒ ላይ ማስማማት የሚሆን የኮምፒዩተር ፕሮግራም ማጠቃለያ ወይንም ነው። | | | | | |

FOR: *[Signature]*
 Mulugeta Ayele
 Technology Director
 KCP&S
 Editor to Translation



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|---|--|--|--|
| 43. ከሰው ፈ.አ.ሲ.ሲ.ፕን መስተዋዕት ዘድመርገጃ ወይም ማስተማሪያ ስራ ላይ የሚሰጡት ገንዘብ ለማግኘት ማድረግ ይቻላል። | | | |
| አምነት | | | |
| 44. የሰው ፈ.አ.ሲ.ሲ.ፕን አገልግሎት ለማግኘት የሚገባውን ነገር። | | | |
| 45. የሰው ፈ.አ.ሲ.ሲ.ፕን አገልግሎት ለማግኘት ነገር ላይ ማድረግ። | | | |
| 46. የሰው ፈ.አ.ሲ.ሲ.ፕን መተግበሪያ ወይም ጥበቃ መረጃዎችን ለሌሎች ለማድረግ ይቻላል። | | | |
| 47. ከሰው ፈ.አ.ሲ.ሲ.ፕን ለሌሎች ለማድረግ ይቻላል። | | | |
| ውጤቶች ተጠቃሚ | | | |
| 48. ከሰው ፈ.አ.ሲ.ሲ.ፕን በመቀጠል በመስተዋዕት ለገዢ የሚገኘውን ያልሌ ወገን ተጠቃሚ አድርጎ። | | | |
| 49. መንገድ የሰው ፈ.አ.ሲ.ሲ.ፕን ተጠቃሚነት ለማግኘት የተሰጠውን ማረጋገጫዎችን ያደርጋል። | | | |
| 50. በደርጅቱ ደንቦች የሰው ፈ.አ.ሲ.ሲ.ፕን ለመስተዋዕት ማድረግ ይቻላል። | | | |
| 51. ከሰው ፈ.አ.ሲ.ሲ.ፕን መሰረት ያደረገ ገልጻል። ለመስተዋዕት ለማግኘት ለማግኘት ይቻላል። | | | |
| የሰው ፈ.አ.ሲ.ሲ.ፕን ተቀባይነት | | | |
| 52. ደርጅቱ የሰው ፈ.አ.ሲ.ሲ.ፕን ለመስተዋዕት ለማግኘት ይቻላል። | | | |
| 53. የሰው ፈ.አ.ሲ.ሲ.ፕን ለማግኘት የሚገኘውን ማድረግ ይቻላል። | | | |
| 54. በደርጅቱ የሰው ፈ.አ.ሲ.ሲ.ፕን ተጠቃሚነት ለማግኘት ይቻላል። | | | |
| 55. ደርጅቱ የሰው ፈ.አ.ሲ.ሲ.ፕን በመቀጠል በመተግበሪያ ወይም ለሌሎች ለማግኘት ይቻላል። | | | |
| 56. ደርጅቱ የሰው ፈ.አ.ሲ.ሲ.ፕን ለመቀጠል በመተግበሪያ ወይም ለሌሎች ለማግኘት ይቻላል። | | | |

በሰው ፈ.አ.ሲ.ሲ.ፕን ለማግኘት ለማድረግ ለሚገኘው ማድረግ

/s/ *[Signature]*
 አገልግሎት
 የሰው ፈ.አ.ሲ.ሲ.ፕን
 አገልግሎት

