FACTORS INFLUENCING CLOUD ADOPTION BY THE ORGANIZATION FOR ENTERPRISE SOFTWARE PRODUCT

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By

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Abstract

Enterprise Software products are available in two deployment models: On-Premise and Cloud Computing. Software products installed on computer hardware and available in the customer's premises are known as On-Premise software. Software products installed in the vendor's data center and available to the customer over the internet are known as the Cloud computing model of a software product. There are theories and frameworks like Diffusion of Innovations, DEMATEL, and Technological-Organization-Environment framework which helps in determining factors influencing customer's decision to adopt innovations by the organizations. In this research study, we have proposed a conceptual model by integrating these frameworks to examine factors influencing an organization's decision to adopt either an On-premise or Cloud Computing deployment model of the software product.

The integrated model will help in understanding the adoption of either on-premise or cloud computing model according to the stage of adoption at which the organization is standing. For organizations who are at the stage to adopt either on-premise or cloud deployment model, the integrated research model helps in understanding the advantages and disadvantages of one model over another. For organizations who already have on-premise software product and wants to adopt cloud model, then the integrated research model helps in determining the benefits and risks factors involved in adoption of cloud model. For organizations who already have cloud model and wants to adopt on-premise model, then the factors from integrated research model helps in determining the requirements in adoption of on-premise model of software product.

Using the integrated research model, we have examined the factors influencing an organization's decision to adopt either an on-premise or cloud computing deployment model of the software product. Apart from identifying and assessing the factors which influence organizations to adopt either the on-premise or cloud computing model, we have also identified and examined the critical factors responsible for organizations to re-adopt the on-premise model of the software product from the cloud computing model of the software product. In this research study, mixed-method approach is used. Mixed methods help in the generation of rich data in the initial stages of research which helps in understanding the unexplored areas of the research problem. The primary data is collected using qualitative and quantitative techniques while secondary data is collected using a

review of the literature. Based on the factors resulting from the integrated research model, qualitative analysis is done with the help of focused group discussions and interviews. This approach has improved the understanding of factors influencing organizations to adopt appropriate deployment models of the enterprise software product.

In total, 30 respondents participated during Qualitative data collection, but the researcher incorporated the responses of 20 participants only due to data uniformity issues. The quantitative data is collected using a survey questionnaire. The data was collected using tools like survey monkey and emailing services. In total, 404 organizations participated in the research study. The secondary data was collected from analysts like Gartner, Asia Cloud Computing Association, SMEs in Asia Pacific, and online research reports like Cloud Adoption Statistics for 2021, SMB Cloud Insights, and more. In this research study, the results of qualitative data analysis are presented for the organizations who wants to re-adopt on-premise model from cloud computing model. The results of quantitative data analysis are presented for the organizations who wants to adopt cloud computing model from on-premise model.

Factors from integrated research model are classified into two groups based on the profile of the buyer, and they are the economic buyer, the technical buyer, and the end user. We have examined these factors with different case organizations from industries like Information Technology, Banking, Financial institutions, E-Commerce, and Pharmaceutical to discover the identical patterns among case organizations. The results from the data analysis reveal that organizations of industry types like Information technology, E-Commerce, and Pharmaceutical are adopting a cloud computing model of software products irrespective of the organization size. In contrast, Financial institutions and Banking organizations are not adopting the cloud computing model of a software product. These organizations are adopting only the on-premise model of the software product or a hybrid model where applications run in the cloud and data is stored in on-premise infrastructure.

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LIST OF ABBREVIATIONS

Abbreviation	Full Form
&	And
AVE	Average Variance Extracted
AVP	Assistant Vice President
CD	Compact Disc
COVID-19	Corona Virus
CEO	Chief Executive Officer
CIOs	Chief Information Officer
DEMATEL	Decision making trial and evaluation laboratory
DOI	Diffusion of Innovation
DVD	Digital Versatile Disc
etc	Et Cetera
EFA	Exploratory Factor Analysis
ID	Identity
IT	Information Technology
ICT	Information and communication tools
ISO	Identical Storage Image
IPR	Intellectual property rights
KMO	Kaiser-Meyer-Olkin
MSME	Micro, Small and Medium sized Enterprise
NASSCOM	The National Association of Software and Services Companies
PLS	Partial Least Squares
SD	Standard Deviation
SEM	Structural Equation Analysis
SME	Small and Medium sized Enterprise
TOE	Technological-Organizational-Environmental
TOEHB	Technological-Organizational-Environmental Human and Business
TAM	Technology Acceptance Model
TTF	Task Technology fit
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
VP	Vice President

CHAPTER - I

INTRODUCTION

Chapter - I

INTRODUCTION

1.1. Overview

The information technology industry has seen tremendous changes over the last few decades. During its evolution and with respect to hardware perspective, it was Mainframe by IBM which dominated the industry. The size of these mainframe computers was very big, and they were very expensive too. Personal Computers or Desktops or Microcomputers evolved during the 1970s and 1980s. These were the very least expensive and became the de facto computer of choice for homes and offices during mid-1990s. The most popular operating systems used for these computers are Windows, Linux, Mac OSx. Then came the boom for Mobile computers like Laptops which allowed the user to go mobile. Users can carry this computer with them from one place to another without disturbing work. Smartphones are the recent innovations in the field of IT industry. These are more often called pocket computers and are very small in size.

Figure 1.1: Evolution of computers from Mainframes to Smartphones

Source: Authors own source

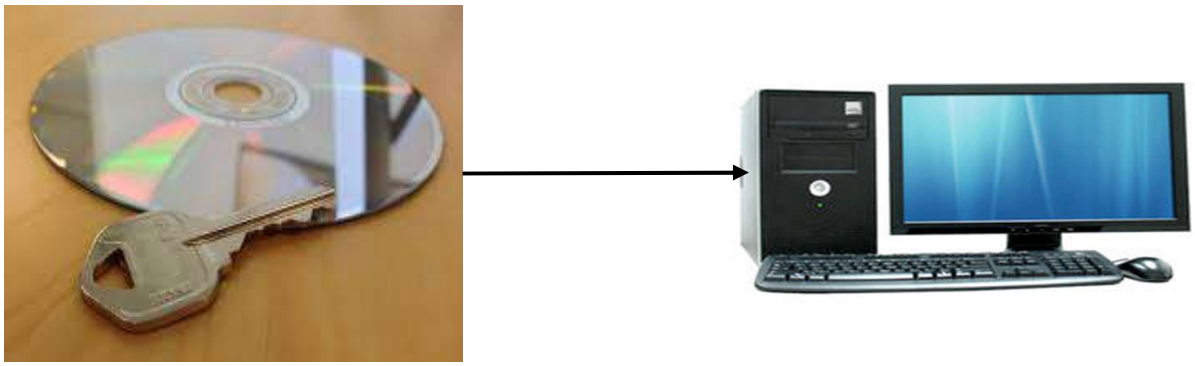
Now with respect to Software, the evolution happened only into two models namely (Embroker, 2022)

I. On-premise
II. Cloud computing

1.1.1 *On-Premise Model of Software product*:

Software products installed on computers or appliances and physically available on the premises of the customer are known as On-Premise software products. These products are available to end customers via downloads, ISOs, DVDs, CDs, etc. The end user needs a license key to use this. Examples include but not limited to operating systems like Linux, windows, Office applications like Microsoft Office, Accounting software like FOCUS, Wings & Tally, etc.

Figure 1.1.1- 1: Software product Installed on the Computer and available in the premises of customer

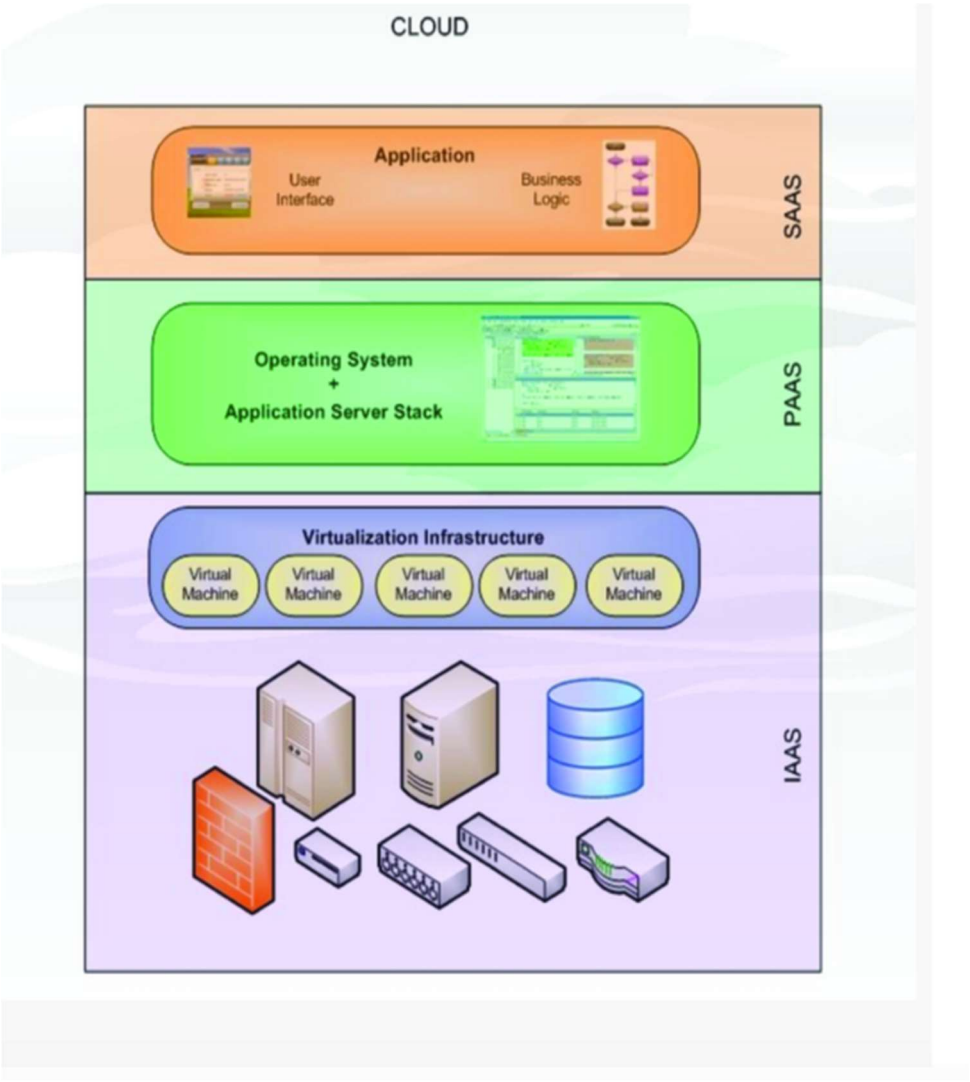


Source: Authors own source

1.1.2 *Cloud Computing Model of Software product*:

In the Cloud Computing model of Software products, the software product is installed in the data center of a vendor who is the manufacturer of the software product. In this deployment model, the software product and its services are available to the customer through the internet.

Figure 1.1.2-1: Three Layers of Cloud Computing Service model



Source: Software-as-a-service and pricing strategy for vendors (Nizar et al., 2010)

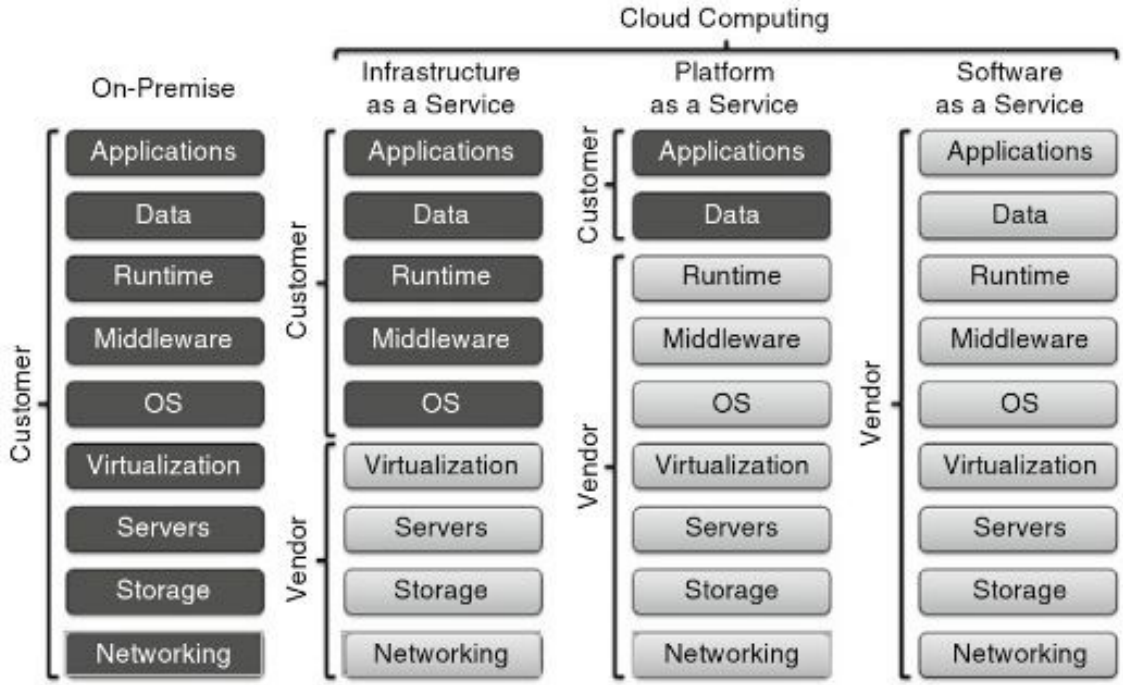
Cloud computing services are majorly available in three forms: Software-as-a-service, *Infrastructure-as-a-service, and Platform-as-a-service.*

- *SaaS (Software-as-a-service)* is a cloud computing service model that provides virtualization of software applications, (Rouse, 2015). Ex: Google Apps, Office 365.

- *PaaS (Platform-as-a-service)* is a cloud computing service model that provides virtualization of Operating systems, (Rouse, 2015). Ex: Windows, Linux.

- *IaaS (Infrastructure-as-a-service)* is a cloud computing service model that virtualizes computing resources, (Rouse, 2015). Ex: Servers, Storage, and Networking hardware.

Figure 1.1.2-2: Comparison between On-Premise and Cloud computing from Vendor's and Customer's Manageability perspective



Source: What Type of Cloud is SharePoint Online, (Apergis, 2012)

The above figure 1.1.2.-2 depicts the typical architecture of the on-premise vs cloud computing deployment model of the enterprise software product. In the on-premise deployment model, the computing resources like storage, memory, central processing unit, application software, and data are managed by the customer themselves. Organizations or customers are solely responsible for maintaining the software product for on-premise model whereas in the cloud computing deployment model, it depends on the cloud service model, (Apergis, 2012). In the software-as-a-service cloud deployment model, all the computing resources, data, and application software are

maintained by the vendor itself, (Rouse, 2015). In the infrastructure-as-a-service cloud deployment model, only computing resources such as storage, and central processing units are maintained by the vendor where as organizations owns the responsibility of maintaining the middle layer software environment such as operating system, application software, and data, (Rouse, 2015). In the platform-as-a-service cloud deployment model, the vendor maintains the computing resources such as storage, central processing unit, and in addition middle layer environment of a software product such as operating systems. The organization owns the responsibility of application software and data, (Rouse, 2015).

The most common information and communication tools (ICT) that are needed for organizations operating in any type of industry are email systems, file sharing systems, human resource information systems, vpn, firewalls, policy management, and device management etc. These types of software products are needed in day-to-day operations for any organization. These kinds of software products are available in all kinds of deployment models. For example, Microsoft Exchange Server is the email system available in an on-premise model and Microsoft office 365 is the email system available as a software-as-a-service deployment model. Microsoft Exchange server email system can also be deployed as infrastructure-as-a-service or platform-as-a-service in cloud vendor's data center such as Microsoft Azure, Amazon web services, etc.

1.2. Objectives

Organizations need IT infrastructure for their day-to-day operations. With the recent advancements in the field of distributed computing, organizations have a choice to adopt the either on-premise model of the software product or the cloud computing model of the software product. Even customers with existing IT infrastructure are adopting cloud computing from an on-premise model. Cloud computing is the new revolution in Information Technology, but it is not a good choice for all organizations. The objective of this research study are listed below and will help organizations in decision-making for the adoption of enterprise software product deployment model.

Objective 1: To identify the factors influencing cloud adoption for enterprise software products.

Objective 2: To assess the influence of factors towards the decision to cloud adoption from an on-premise model of the enterprise software product.

Objective 3: To identify and assess the reasons behind moving from the cloud computing model of the software product to the On-premise model of the software product.

1.3. Research Motivation

Cloud computing is a new innovation in the field of information technology. There are several advantages of the cloud computing deployment model of a software product but at the same time, it is not a good choice for all kinds of organizations operating in different types of industries and environments. Until now researchers has focused their study on the adoption of cloud computing but there are several other factors that influence organizations to adopt the on-premise model of the software product or re-adopt on-premise model of the software product from cloud computing.

There are lots of complexities involved in the process of decision-making for buying an enterprise software product's deployment model. There are different stakeholders and buyers who are responsible for making the decision to buy either an on-premise or cloud computing model of the software product. Miller et al., (2011); Miller & Heiman (1985), in their book have mentioned that sales is a complex process and involves multiple buyers. In any complex sales process, there are four buying roles namely Economic Buying Influence, User Buying Influences, Technical Buying Influences, and Coach. The research done so far has not considered the different scopes of buying decisions. The different scopes are as follows.

- Organizations with new requirement can adopt either on-premise or cloud computing model of software product
- Organizations that already have an on-premise model of software product wants to adopt a cloud computing model.
- Organizations that adopted the cloud computing model want to re-adopt the on-premise model of software product.

The factors differ according to the scopes defined above. Due to these complexities, appropriate research frameworks and theories need to be integrated for studying the influence of various factors in decision-making. These complexities and the perspective of each stakeholder and buyer sparked a special interest in pursuing this research study. The main focus is on identifying and assessing

the factors influencing organizations to adopt cloud service model from on-premise model with respect to stake holders like economic buyer, technical buyer and end user.

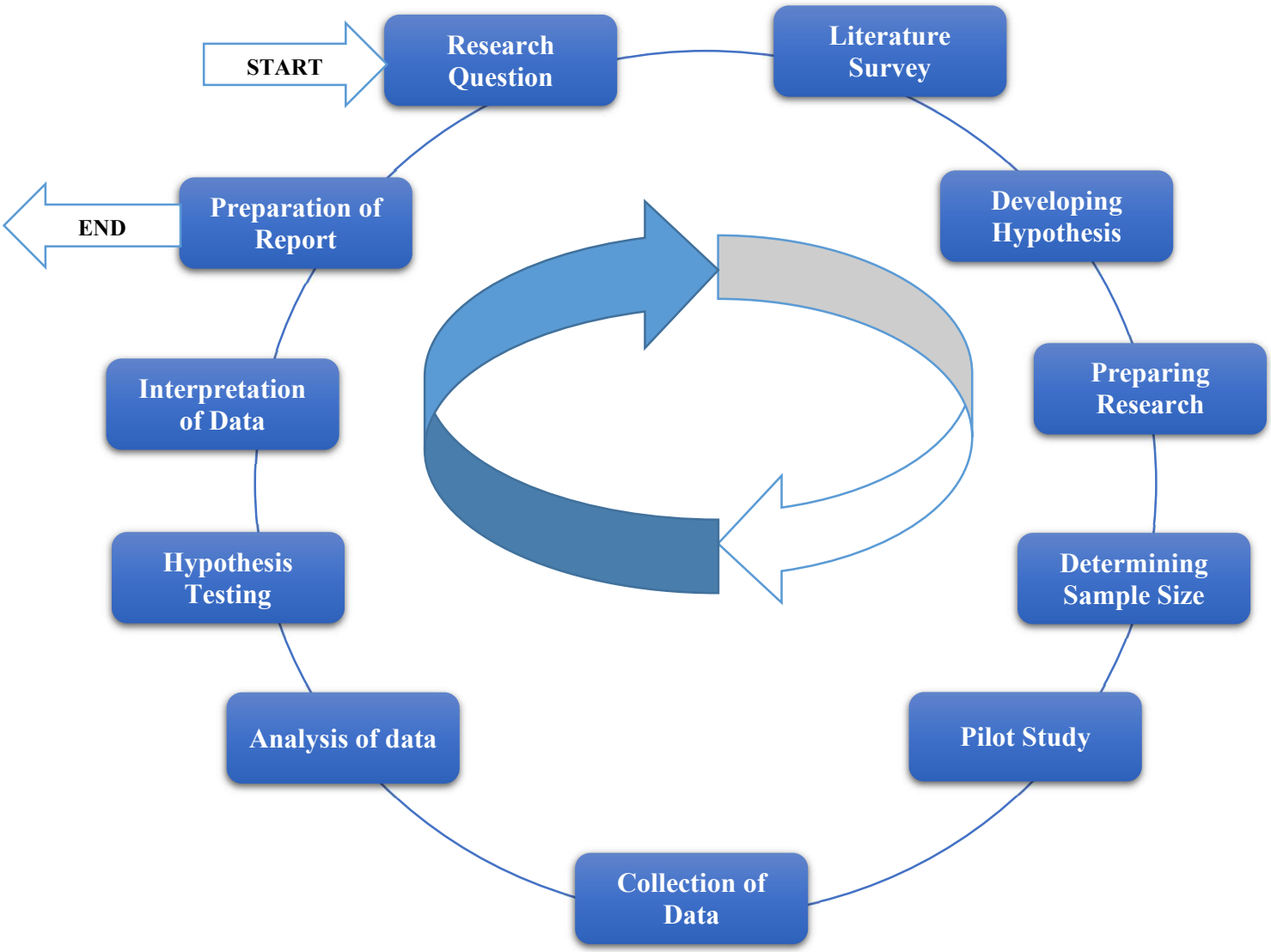
1.4. Overview of Research Approach

The goal of this research is to identify and examine the factors influencing organizations in decision-making for the cloud deployment model. A conceptual framework is developed which depicts the research process followed in this study. This conceptual framework is represented in Figure 1.4-1. It is developed based on the analysis of existing literature and has helped to explain the various stages and research concepts followed in this study.

The research study is broadly divided into two phases depending on data collection and data analysis. The first phase is the qualitative phase of data collection and data analysis. The second phase is the quantitative phase of data collection and data analysis. This is in line with the mixed methodology approach of the research study. This approach has allowed us to generate rich sets of data in relation to the unexplored areas of an organization's decision to buy an On-premise deployment model or cloud service deployment model of the software product. The qualitative phase is the pilot study of research, and it involves data collection using qualitative methods like interviews and focus group discussions. Field notes were used to refine the questionnaires, and interviews repeatedly.

The quantitative phase of this study is the second phase which involved the survey questionnaire development from the outcomes of the qualitative study, and this was meant for a large number of respondents. The actual goal of this mixed method is to explore the various outcomes of the research study (Creswell, 2005). This method has been widely recognized and adopted for research studies. The mixed methodology research approach provides researchers with an opportunity to expand the knowledge gained from qualitative analysis to the quantitative phase of the study

Figure 1.4-1 – Overview of Research Process



Source: Authors own source

The participants were from different levels in the hierarchy of organizations. They included Vice Presidents, Directors, Program Managers, IT Procurement Managers, Senior Managers, and IT Staff during qualitative and quantitative data collection of the research study. INDIA is a growing economy and has a large presence of multi-national organizations distributed across different cities. Researchers have covered organizations of various types in different cities like Bengaluru, Chennai, Hyderabad, and Pune. The different types of industries covered are IT Industry,

Financial Institutions & Banking, E-Commerce, and Pharmaceutical. The main objective of the research study is to determine and examine the factors influencing an organization's decision to adopt a cloud service deployment model of the software product.

1.5. Relevance of the Topic

There are lots of complexities involved in the process of decision-making for buying an enterprise software product model. There are different stakeholders and buyers who are responsible for making the decision to buy either the on-premise or cloud computing deployment model of the software product, (Miller & Heiman, 1985). Most organizations are adopting cloud technologies without understanding the practical implications involved in them. As a result, they are again moving back to the on-premise deployment model of the software product. A lot of research has been done by researchers to just identify and assess the factors that can influence organizations for the adoption of the cloud deployment model. But there is no or little research done so far to address the following relevance.

- Identify the stage at which the organization is standing for adopting the cloud computing deployment model of the software product.

- Identify the different stakeholders who will be involved in the decision process of adopting the cloud computing deployment model of the software product.

- Identify the factors with respect to different stakeholders that can influence organizations to adopt the cloud computing deployment model of the software product.

- Assess the identified factors with respect to different stakeholders that can influence organizations to adopt the cloud computing deployment model of the software product.

1.6. Scope of the Research:

INDIA is a fast-growing economy having the presence of multi-national companies in large numbers. The scope of this research is different types of MNCs located in Bengaluru, Hyderabad, Pune, and Chennai in INDIA. The types of Industries covered are Banking, Financial institutions,

E-commerce, Information Technology, and Pharmaceuticals. The factors are classified according to the type of buyers involved in the decision-making of buying an enterprise software product. There are three types of buyers namely economic buyers, technical buyers, and end users, (Miller & Heiman, 1985). Beveridge (2017) has published in his work that economic buyers are the stakeholders like CEOs, CIOs, VPs, Directors, and Managers who are involved in the decision-making of buying an enterprise software product. The main concerning key factor of these buyers is cost optimization. Technical buyers are the stakeholders like IT Directors, IT Managers, and IT Staff who are involved in the decision-making of buying enterprise software products, (Beveridge 2017). The main concerning factors of these buyers are functionality, performance, security, privacy, and ease of use. End users are the actual consumers of the software product and are never involved in the decision-making of buying an enterprise software product. Generally, Technical buyers will make decisions on behalf of end users. Therefore, the factors are now classified into 2 categories, and they are economic buyers, technical buyers, and end users. The scope is further refined as below:

1.6.1 Organizations with existing on-premise infrastructure adopting the cloud computing model of the software product.

1.6.2 Organizations with existing cloud computing infrastructure moving back to the on-premise model of the software product.

1.7. Outline of Thesis Chapters

Chapter 2 presents the literature that has contributed to this research study and provided the direction toward identifying and examining the factors influencing an organization's decision to adopt either an on-premise or a cloud service model of the enterprise software product. It begins with different theories and scientific models that helped in studying the adoption of innovation by organizations and then focuses on theories related to the adoption of innovation (Diffusion of Innovation, Technology-organization-environment framework, DEMATEL). The remaining half of the chapter presents a chronological order of research work done by researchers. Chapter 2 also presents existing theories, frameworks, and scientific models used in the research study for examining the factors influencing an organization's decision to adopt either an on-premise or cloud

service model of the software product. The researcher then presented the need for an integrated model based on the research scope like the adoption of a cloud computing model or re-adoption of an on-premise software product's deployment model. This chapter then explains the development of the conceptual model and its need to address the complexities involved in the decision process of adopting the correct deployment model of the software product.

Chapter 3 presents a synopsis of the research framework, methodology, and design. The researcher first describes the mixed method approach used in the research study. It focuses on both qualitative and quantitative characteristics of research. The researcher then described the reasons and methods for developing the survey questionnaire. This chapter also provides how the survey is constructed, the selection of scale, and the coding scheme used for the questionnaire. The chapter concludes with the pilot study done in 4 major cities of INDIA – Bengaluru, Chennai, Hyderabad, and Pune with different case organizations from various industry types like Banking, Financial, E-Commerce, IT Industry, and Pharmaceutical. Chapter 3 also presents a detailed justification for using the mixed mode of qualitative and quantitative techniques used in the research study. It then describes the details of the pilot study, how the case organizations are selected, and the techniques used in data collection. The chapter then dives into the data analysis and findings with the help of techniques like with-in-case analysis, qualitative comparative analysis, and across-case analysis. The main goal of this chapter is to refine the conceptual framework developed in Chapter 2 with the help of a pilot study.

Chapter 4 presents the survey analysis of different types of industries in INDIA. The chapter starts with an overview of industries and data preparation. It then presents details on participants or case organization for qualitative analysis and the rate of survey responses for quantitative analysis. The chapter then provides a detailed analysis of qualitative and quantitative data based on qualitative techniques like focused group discussions, interviews, and survey questionnaires.

Chapter 5 concludes the research work. It outlines the summary of research findings, and the contribution of the research study to the various industry types like IT, Finance & Banking, Pharmaceutical, and E-commerce. It also explains the limitations of the research study and provides direction for future research.

1.8. Summary

This chapter has described the objectives of this research study. In summary, the main goal of this research study is to determine and examine the factors influencing an organization's decision for adopting the correct deployment model of the enterprise software product. There are two deployment models of enterprise software products namely on-premise and cloud computing. The scope of this research study is organizations of different types of industries operating in INDIA. The chapter started with an introduction to the theoretical grounding of this research study, including the objectives, motivation, research process, and contributions that it makes to the industry. Finally, the chapter is concluded with an overview of the remaining chapters in this dissertation.

CHAPTER - II

REVIEW OF LITERATURE

Chapter - II

REVIEW OF LITERATURE

2.1. Introduction

A literature review is a systematic analysis of the available research studies done so far in a particular research field. It not only helps provide the research gaps and scope for a research study but also provides an analysis of existing research in a precisely defined research area. Scholarly articles, Online articles, Analyst reports, and research papers are referred while conducting the review of literature because it investigates and helps in identifying the prior work done for a chosen research problem. A literature review is the building block for laying down the foundation for the research topic and further develop on it. It also helps identify the research gaps, limitations, and inconsistencies in previous studies. A literature review also provides the available scientific models, theories, frameworks, and concepts that can help in doing the research.

Based on the researcher's interest in the topic of complexities involved in decision-making for the cloud adoption deployment model of the enterprise software product, the scholar probed the available literature from both national and global perspectives. In order to understand the complexities involved in adopting the enterprise software deployment model, the researcher has studied the various forms of literature available in the research area. The goal of this research is to assess and identify the factors and complexities involved in procuring the deployment model for the enterprise software product.

The literature review for this research study is conducted in several stages. In the first stage, the literature relevant to how the cloud computing deployment model of the enterprise software product is affecting technology, business, and end-user experience is studied because cloud computing is the latest innovation in the field of information technology. The findings of this stage have led to the second stage and the researcher's curiosity to find more details on the basic problems induced by cloud computing technology for both vendors and customers. In the final stage of the literature review, it is concluded that the cloud computing deployment model of the software product is a good innovation in the field of information technology. Still, it is not a good

choice for everyone. With this innovation, organizations are now having difficulty deciding which deployment model of the enterprise software product to be adopted i,e.. either on-premise or cloud computing. Therefore, a thorough study is needed to understand the complexities involved in deciding which deployment model of the software product to be adopted by an organization. The final stage of the literature review has also set the various activities like scale preparation, scientific model selection, and tool validation.

2.2. Overview of Literature Reviewed

Research studies indicate that organizations have performed better when technological innovations are adopted and may succeed over their competitors (Geroski et al., 1993). Innovations in Information and communication technology have been the subject of a lot of research studies and are widely accepted as a critical determinant for high performance (Blundell et al., 1999). Innovation is defined as an idea, practice, or object that is perceived as new by an individual or any other unit of adoption (Rogers, 2003). Innovation in Information and communication technology not only refers to the new idea but also refers to renewing the technology in terms of action and thought (Thong, 1999). At a broad level, Innovations in Information and communication technology include two critical factors and they are:

a) Determining existing innovation in information and communication technology
b) If the existing innovation is not successful, then find more advanced Information and communication technology innovation.

Rogers (1995), also pointed out that innovation goes through five stages of the adoption process:

a) Knowledge or Awareness
b) Persuasion
c) Decision
d) Implementation
e) Confirmation or Continuation

In Knowledge or Awareness, the individual is first exposed to an innovation but lacks information about the innovation. During this stage, the individual has not yet been inspired to find out more information about the innovation. In the persuasion stage, the potential adopter will be more involved as compared to the knowledge stage and begin to actively seek out relevant information.

Individuals or decision-making units generate a positive or negative attitude towards an innovation; an innovative perception will also develop, so the perceived characteristics of innovation are particularly important in the persuasion stage. In the Decision Stage, the individual takes the concept of the change and weighs the advantages/disadvantages of using the innovation and decides whether to adopt or reject the innovation. In the implementation stage, the individual employs the innovation to a varying degree depending on the situation. In the final confirmation or continuation stage, the individual finalizes his/her decision to continue using the innovation.

Thompson (1965), has defined the adoption of innovation involves 3 stages namely:

a) Initiation
b) Adoption
c) Implementation

In the Initiation stage, information about the characteristics of the technological innovation is accumulated and evaluated. During the Adoption stage, the results from the evaluation are observed and a decision is made for the adoption of technological innovation. Finally, In the implementation stage, technological innovation is implemented in the organization.

Miller et al., (2011); Miller & Heiman (1985), in their book have mentioned that sales is a complex process and involves multiple buyers. In any complex sales process, there are four buying roles namely Economic Buying Influence, User Buying Influences, Technical Buying Influences, and Coach. In economic buying influences, the person in-charge acts as an economic buyer and gives final approval to buy. The economic buyer has the power to say yes even when all other buyer has said no, (Miller & Heiman, 1985). In User Buying Influences, the person or a team in charge makes the judgment by using the product or service. These people will study the impact on their job performance by the usage of products and services, (Miller & Heiman, 1985). In Technical Buying Influences, the person or team in charge will find the possible suppliers. Their primary focus is to evaluate the product or service and check whether it meets the objectives and specifications. Technical buyers cannot give a final yes, but they can give a final no, (Miller & Heiman, 1985). The Coach is a special role, and the person in charge connects the supplier to all other buyers in the organization, (Miller & Heiman, 1985).

Burke (2022), in his research report on CIO strategy, has said that an economic buyer is a person who controls the budget to buy the new technology, and the persons who are in charge of this role are CIO, IT Department's Managers and more often project or program managers. On the contrary, the person who scrutinizes the technical features of the technology are IT professionals like IT Managers, IT Admins, Engineers, and Architects, (Burke, 2022). End User buyers are professionals who work inside and outside of IT teams. The focus of this team is to test the new product from the viewpoint of administrators, and engineers, (Burke, 2022). Coach is the person who advocates the new technology and the persons who are responsible for this role are CTO, CIO, IT Engineer, IT Admin, and End-user, (Burke, 2022).

Beveridge (2017), has explained different buyer personas involved in complex and challenging economic environments. The economic buyer represents the people involved in the buying process and is solely responsible for activities like cost optimizations. They can approve when everyone is disapproving of the decision and they can disapprove of the decision when everyone is approving it. Technical buyers are the people involved in the buying process and are solely responsible for the technical evaluation of the product or solution technically, (Beveridge, 2017). User buyers are the people involved in the buying process and are solely responsible for end-user activities like the ease of use for end-users, (Beveridge, 2017).

Zebua & Widuri, (2023), did a research study on the adoption of cloud accounting. The study is related to the adoption of cloud accounts by integrating three theories TOE, TAM, and D&M Model. The seven factors identified and used in the study are perceived ease of use, perceived usefulness, top management, organizational competency, system quality, service quality, and intention to use.

Ibrahim et al., (2022), have done a systematic literature review for the adoption of the Software-as-a-Service cloud service model. 68 factors are addressed as obstacles in the adoption of the software-as-a-service cloud service model and out of which 16 factors are identified as critical factors and deeply discussed that will affect cloud computing SaaS adoption. The critical factors are Relative Advantage, Perceived Security Risk, Top Management Support, Competitive Pressure, Government Support, Complexity, Compatibility, Security and Trust, Performance

Issues, Data Security, Data Privacy, Learning Capability of Employees, Organizational readiness, Organizational size, Technology Readiness, Cloud service performance.

Zhang et al., (2021), have done their research to examine the influence of various factors using the TOE framework in post COVID-19 world. They conducted an asymmetric fuzzy-set qualitative comparative analysis identifying nine configurations sets of factors that leads to cloud computing adoption. The contributing factors are Relative Advantage, Perceived Security Risk, Top Management Support, IT Competence, Competitive Pressure, Government Support, and Provider capability.

Gui et al., (2020), did their research on the adoption of cloud computing by Indonesian organizations. The research aims to classify the factors affecting the acceptance of cloud computing in Indonesian MSMEs. The conceptual model used in this study is TOE. The contributing factors are Relative Advantage, Complexity, Compatibility, Privacy concern, Vendor Lock-in, Top Management Support, Organizational readiness, Competitive pressure, Business Partner Pressure, Government support, and Regulatory Policy. The findings from the research study are that the factors like top management support, relative advantages, government policy, and incentives impact positively and result in a higher adoption rate of cloud services by MSMEs.

Baral et al., (2019), have adopted an integrated approach for their research study using scientific models like technology-organizational-environmental framework, and human and business framework. The main objective of their research study is to identify the factors which influence cloud computing adoption in the Indian healthcare sector through the TOEHB perspective. The factors identified from Technological Perspective are an internet connection, compatibility, relative advantage, and integration. The factors identified from Organizational Perspective are infrastructure readiness, trust & security, higher authority support, change resistance, and innovation acceptance. The factors identified from Environmental Perspective are regulatory support, peer pressure, and service expertise. Similarly, the factors identified from Human Perspective are innovativeness, internal excellence, and prior experience and the factors identified from Business Perspective are Hard Financial Analysis, Soft Financial Analysis.

Singh & Mansotra, (2019), has also adopted a technology-organizational-environmental framework in their research study for determining the factors affecting cloud computing adoption in the Indian school education system. The technological factors identified in their study are Relative Advantage, Complexity, and Compatibility. The organizational factors identified are Top Management Support, Technology Readiness. Similarly, the Environmental factors identified are Competitive Pressure, Trading partner pressure, and Vendor scarcity.

Chiniah et al., (2019), discussed the need for adopting an integrated approach to studying cloud adoption behavior in ICT-enabled organizations in Mauritius. The factors identified after the integration of scientific models technology-organizational-environmental framework and technology acceptance models are Relative advantage (TOE), Compatibility (TOE), Complexity (TOE), Organizational competency (TOE), Top management support (TOE), Training and Education (TOE), Competitive pressure (TOE), Trading partner support (TOE), Perceived ease of use (TAM), Perceived usefulness (TAM).

Chen (2019), has studied the adoption of telematics using an integrated approach. The scientific models used by him are the technology acceptance model and the task technology fit model. The main objective is to identify the factors influencing the adoption of telematics. The factors identified after the integration of two scientific models are Perceived Usefulness (TAM), Perceived Ease of Use (TAM), Task Characteristics (TTF), Technology Characteristics (TTF), Performance impact (TTF), Utilization (TTF).

Scherer et al., (2019), have used the Technology acceptance model in studying the teachers' adoption of digital technology in education. TAM variables are classified into Core variables, Outcome variables, and External variables. TAM Core Variables identified are Perceived ease of use, Perceived usefulness, and Attitudes toward technology. TAM Outcome Variables identified are Behavioral intention, Technology use. TAM External Variables identified are Subjective norm, Computer self-efficacy, Facilitating conditions

Yoo & Kim (2018), have also used a technology-organizational-environmental framework as a decision-making framework to adopt cloud computing systems. The feature of this framework was

designed as a three-tier architecture including decision areas, decision factors, and decision attributes to facilitate intuitive and rapid decision-making for decision-makers. The factors used are Cost Advantage, Efficiency, Flexibility, Manageability, Reliability, Security concern, Ease of Use, Usefulness, Integration, Customization, Long-term vision, Commitment of resources, Establishing goals, Financial readiness, Technology infrastructure, Changes of industry structure, Competitive pressure, Government incentives, Law and policies, Vendor support, Technical support, Relationship with providers.

Kandil et al., (2018), have used a technology-organizational-environmental framework for examining the effect of the TOE model on cloud computing adoption in Egypt. The factors explored during his research study are Relative Advantage, Complexity, Compatibility, Security and Trust, Top Management Support, Technology Readiness and Manpower, Maturity and Performance Issues, Telecommunication Infrastructure, Internet Service Provider, and Trading Partner support.

Al-Hujran et al., (2018), have done their research using the TOE framework limited to Jordanian companies. Cloud adoption in Jordanian organizations is very low but they found it very useful. The results of the research reveal that the cloud computing deployment model makes sense to SMEs. At the same time, issues were found relating to TOE (Technology, Organization, and Environment) context which needs to be addressed before using the cloud computing services effectively in organizations in Jordan. The identified technological factors were privacy concerns, compatibility, security, and trust. On the other hand, the main identified organizational factors are top management support, organizational culture, and characteristics of CEOs. Finally, the main identified factors that are hindering the adoption of cloud computing by organizations in Jordan from an environmental standpoint were the need for SLAs contractual agreements, and regulatory framework.

Chiu et al., (2017), have done research on the adoption of Broadband Mobile Applications by Enterprises using an integrated approach. The scientific models used in their research study are TOE (Technology, Organization, and Environment) and DOI (Diffusion of Innovation). The factors used for studying the adoption behavior are Relative Advantage, Complexity,

Compatibility, Trialability, observability, Information Intensity, Management support, Employee Knowledge, Absorptive capability, Competitive Pressure, Business Partner, External support, Government Support.

Weerd et al., (2016), have done research on Indonesian companies for the adoption of Cloud computing's software as a service deployment model. The framework used is Technology-Organization-Environment. However, the research done is limited to the context of organizational factors. In their research study, they discovered that top management support is the enabler for the adoption of cloud services. The three factors used are Top management support, Organizational readiness, and Organizational size.

Awa et al., (2015), have used an integrated approach to studying E-commerce by SMEs. The frameworks used are the Technology Acceptance Model (TAM), TOE (Technology, Organization, and Environment), and TPB (Theory of Planned Behavior). The Factors used for studying e-commerce adoption are Scope of Business Operations, Firm's Size, Organization Mission, Facilitating Conditions (TAM), Individual Difference Factors (TAM), Social Influence or Subjective Norms (TAM), Perceived Usefulness (TAM), Perceived Ease of Use (TAM), Perceived Behavioral Control (TPB), Perceived Service Quality (TPB), Consumer Readiness (TOE), Competitive Pressure (TOE), Trading Partners' Readiness (TOE), Perceived Trust (TOE).

Gangwar et al., (2015), have used an integrated approach to study the influence of factors in adopting cloud technologies. The main objective of the research study is to determine and understand the factors influencing cloud computing adoption. They have integrated scientific models like TAM (Technology Acceptance Model), and TOE (Technology, Organization, and Environment) to study the adoption behavior related to cloud computing. The factors used in the research study are Relative advantage(TOE), Compatibility(TOE), Complexity(TOE), Organizational competency(TOE), Top management support(TOE), Training and Education (TOE), Competitive pressure(TOE), Trading partner support(TOE), Perceived ease of use(TAM), Perceived usefulness(TAM).

Mangula et al., (2014), have done extensive research on the adoption behavior by organizations in Indonesia for cloud computing technologies. The framework used by them was TOE (Technology, Organization and Environment). The factors used in their study are Relative Advantage, Compatibility, Complexity, Trialability, Observability, Organization Readiness, Top Management Support, Market Pressure, Market Competition, Vendor Marketing Effort, Trust in Vendor, Government Support.

Yeboah-Boateng et al., (2014), have used the TOE (Technology, Organization, and Environment) framework for studying the factors influencing the adoption of Cloud Computing by small and medium enterprises in developing economies. The factors used in this study are the Trialability of Cloud Services, Existence of Required IT Infrastructure and Resources, Compatibility with Existing Systems, Strength of In-built Security Systems, Learning Capability of Employees, Limited Technical Knowledge about Similar Technologies, Non-performance of Cloud Services to support Operations, Top Management Support and Involvement, Resistance towards New Technologies, Conformity with Work Culture and Style, Impact of Organizational Structure and Size, First Adopters in Our Industry, Adequate User and Technical Support from Provider, Choice of Skilled and Expert Cloud Vendors, Influence of Market Scope, The Nature of Industry, Relationship with Providers, Government, and Competitors.

Rosado et al., (2012), have done security analysis in migration to cloud environments. In his qualitative research study, they determined the benefits, and challenges of cloud computing technologies. The approach suggested by them for migrating to a cloud environment is as follows:

- Look for an established vendor with a track record
- Does the project really need to be migrated?
- Consider data security
- Data transfer
- Data storage and location
- Scaling
- Service level guarantees
- Upgrade and maintenance schedules
- Software architecture

- Check with the lawyers

Mangula et al., (2012), in their research study "Adoption of the cloud business model in Indonesia: triggers, benefits, and challenges" discussed triggering factors, benefits, and challenges for the adoption of the cloud business model. They are as follows:

- Triggering Factors are identified which are Demand, Cloud phenomenon, Lower demand for hardware procurement, Cloud extensive market, Business portfolio alignment, Business enhancement, and Recurrent business revenues.
- Benefits Identified are Positive trends in revenue gains, Enlargement of customer base, strengthening of customer's dependency, Business continuity, and Increase in operational expense efficiency.
- Challenges identified are Security issues, Low speed of internet connection in rural areas, Cost expensive bandwidth services and hardware procurement, Slow user adoption, Business analysis capability, Users' anxiety, Lack of knowledge of cloud computing business model, and Partnership opportunity.

Chen & Zhao, (2012), has discussed the security and privacy protection issues in cloud computing. Based on the life cycle of data, the security and privacy issues identified are Data Life Cycle, Data Generation, Data Transfer, Data Use, Data Share, Data Storage, Data Archival, and Data Destruction.

Al-Jabri & Sohail, (2012), has done research on mobile banking adoption. They have used the scientific model of Diffusion of Innovation for studying the influence of factors on the adoption of mobile banking in Saudi Arabia. The factors used in this study are Relative Advantage, Complexity, Compatibility, Trialability, Observability, and Perceived Risk.

Alshamaila et al., (2013), have done research on Cloud Computing adoption by SMEs in the North East of England. The framework used for studying the influence of various factors on Cloud computing adoption is TOE (Technology, Organization, and Environment). The factors used in this study are Relative Advantage, Uncertainty, Compatibility, Complexity, Trialability,

Observability, Size, Top Management Support, Innovativeness, Prior IT experience, Competitive pressure, Industry, Market scope, Supplier efforts, and external computing support.

Mujinga & Chipangura, (2011), has also done research on concerns related to cloud computing in developing economies. They have determined the Security issues in cloud computing. The concerns are as follows: Service Availability, Identity Management, Data and Application Security, Privacy, Service Level Agreement Negotiation

Wen & Chen (2010), has done research on E-business value creation in Small and Medium Enterprises in the US. The framework used for studying the influence of various factors on Cloud computing adoption is TOE (Technology, Organization, and Environment). The factors used in this study are Relative Advantage, Compatibility, Complexity, Trialability, Observability, Size, Top Management Support, Prior IT experience, organizational readiness, Competitive pressure, Industry, Market scope, Supplier efforts, and external computing support.

Park (2009), has done An Analysis of the Technology Acceptance Model to Understanding University Students' Behavioral Intention to Use e-Learning. The TAM factors used in this research study are Perceived usefulness, Attitude, Behavioral intention, e-learning self-efficacy, Subjective norm, and System accessibility.

Similarly, Al-Qirim (2006), has done research on The Adoption of E-commerce Communications and Applications Technologies in Small Businesses in New Zealand. The framework used for studying the influence of various factors on the Adoption of E-commerce Communications and Applications Technologies is TOE (Technology, Organization, and Environment). The factors used in this study are Relative Advantage, Compatibility, Complexity, Top Management Support, organizational readiness, Informational intensity, managerial time, Competitive pressure, Government pressure, Consumer readiness, and support from technology vendors.

In general, the majority of researchers have done their study on the adoption of technologies like e-commerce, cloud computing, digital technology, mobile broadband, and telematics using scientific models and research frameworks like TOE (Technology, Organization, and

Environment), TAM (Technology Acceptance Model), DEMTEL (Decision Making Trial and Evaluation Laboratory), DOI (Diffusion of Innovation), TTF (Task Technology fit), TPB (Theory of Planned Behavior), TRA (Theory of Reasoned Action). Few of the researchers have also used integrated approach of above mentioned theories and frameworks to study the adoption behavior of innovation in organizations.

Cloud computing is a recent innovation in the field of Software product deployment models. It is a complex decision to be made by the stakeholders to adopt either an on-premise or cloud model of the software product. The following are the reasons which have sparked a special interest to pursue the research study in the adoption of enterprise software product deployment models namely on-premise and cloud computing.

- There are different stakeholders involved in buying decisions for the enterprise software product and they are the Economic buyer, Technical Buyer, and the end user, (Miller & Heiman, 1985). None of the research work done so far has considered the viewpoint of these stakeholders and the different factors influencing them.

- The research done so far has not considered the different scopes of buying decisions. The different scopes are as follows.
    - Organizations that already have an on-premise model of software product wants to adopt the cloud computing model.

    - Organizations that adopted the cloud model want to move back again to the on-premise model.

- The factors differ according to the scopes defined above and due to these complexities, appropriate research frameworks and theories need to be integrated in studying the influence of various factors in decision-making.

- The research done so far has not considered the different cloud service models like Software-As-A-Service, Platform-As-A-Service, and Infrastructure-As-A-Service.

Based on the above reasons, the research study is conducted to study the factors influencing organizations to adopt appropriate deployment model of enterprise software product.

2.3. Summary of Literature review conducted in chronological order

Table 2.3.1: Review of Literature in Chronological order

Literature Reviewed	Literature type	Author/s	Published Year	Contribution
Analysis of Factors affecting adoption of cloud accounting in Indonesia	Research Paper, Journal of Theoretical and Applied Information Technology	Sulina Zebua, Rindang Widuri	2023	The study is related to adoption of cloud account by integrating three theories TOE, TAM, and De Lone and McLean. The seven factors identified and used in the study are perceived ease of use, perceived usefulness, top management, organizational competency, system quality, service quality, and intention to use.
Software as a Service Challenges: A Systematic Literature Review	Book Chapter Springr, LNNS,volume 561	Ahmed Mamdouh Abdelfatah Ibrahim, Norris Syed Abdullah & Mahadi Bahari	2022	68 factors are used to study the adoption behaviour and out of which 16 factors are identified as critical factors and deeply discussed that may affects Cloud computing SaaS adoption. The critical factors are Relative Advantage, Perceived Security Risk, Top Management Support, Competitive Pressure, Government Support, Complexity, Compatibility, Security and Trust, Performance Issues, Data Security, Data Privacy, Learning Capability of Employees, Organizational readiness, Organizational size, Technology Readiness, Cloud service performance.
Understanding the Complex Adoption Behavior of Cloud Services by SMEs Based on Complexity Theory: A	Research Paper, Wiley | Hindawi Complexity Journal	Ge Zhang, Weijie Wang, Yikai Liang	2021	Research study is based on the adoption of cloud by SMEs during post Covid-19 world. The conceptual model is developed using TOE Framework. The contributing factors are Relative Advantage, Perceived Security Risk, Top Management Support, IT Competence Competitive

Fuzzy Sets Qualitative Comparative Analysis (fsQCA)				Pressure, Government Support, Provider Capability.
Cloud Computing Adoption Using TOE Framework for Indonesia's Micro Small Medium Enterprises	Research Paper, International Journal of informatics visualization	Anderes Gui, Yudi Fernando, Muhammad Shabir Shaharudin, Mazita Mokhtar, I Gusti Made Karmawan, Suryanto	2020	This research aims to classify the factors affecting the acceptance of cloud computing in Indonesian MSMEs. The conceptual model used in this study is TOE. The contributing factors are Relative Advantage, Complexity, Compatibility, Privacy concern, Vendor Lock-in, Top Management Support, organizational readiness, Competitive pressure, Business Partner Pressure, Government support, Regulatory Policy.
Impact of Cloud Computing in Indian Healthcare Firms: A Study	Research Paper, International Journal of Scientific & Technology	Manish Mohan Baral, Amitabh Verma, Venkataiah Chittipaka	2019	Integrated research model using frameworks like TOE, Human Perspective, Business Perspective is used in research study and limited to INDIAN health care industry.
Factors affecting cloud computing adoption in the Indian school education system	Research Paper, Springer	Jewan Singh Vibhakar Mansotra	2019	TOE model is used in research study Relative Advantage, Complexity, Compatibility, Top Management Support, Technology Readiness, Competitive Pressure, Trading partner pressure, Vendor scarcity
Evaluation of Cloud Computing Adoption Using a Hybrid TAM/TOE Model	Research Paper, In book: Information Systems Design and Intelligent Applications	Aatish Chin iah Avinash E. U. Mungur Krishnen N aidoo Permal	2019	Research Study is based on organizations in Mauritius using integrated approach of TAM-TOE. Factors identified are as follows: Relative advantage(TOE), Compatibility(TOE), Complexity(TOE), organizational competency(TOE), Top management support(TOE), Training and education(TOE), Competitive pressure(TOE), Trading partner support(TOE), Perceived ease of use(TAM), Perceived usefulness(TAM)

Extending a TAM–TTF model with perceptions toward telematics adoption	Research Paper, Asia Pacific Journal of Marketing and Logistics	Nai-Hua Chen	2019	Factors used for study: Perceived Usefulness (TAM), Perceived Ease of Use (TAM), Task Characteristics (TTF), Technology Characteristics (TTF), Performance impact (TTF), Utilization (TTF)
The technology acceptance model (TAM): A meta-analytic structural equation modeling approach to explaining teachers' adoption of digital technology in education	Research Paper, Computers & Education, Elsevier ScienceDirect Journals	Ronny Scherer, Fazilat Siddiq, Jo Tondeurc	2018	TAM Core Variables - Perceived ease of use - Perceived usefulness - Attitudes toward technology Outcome Variables - Behavioral intention - Technology use External Variables - Subjective norm - Computer self-efficacy - Facilitating conditions
A Decision-Making Model for Adopting a Cloud Computing System	Research Paper, Sustainability journal	Seok-Keun Yoo and Bo-Young Kim	2018	TOE model is used in research study. The factors used are: Cost Advantage, Efficiency, Flexibility, Manageability, Reliability, Security concern, Ease of Use, Usefulness, Integration, Customization, Long-term vision, Commitment of resources, Establishing goals, Financial readiness, Technology infrastructure, Changes of industry structure, Competitive pressure, Government incentives, Law and policies, Vendor support, Technical support, Relationship with providers
Examining the effect of TOE model on cloud computing adoption in Egypt	Research Paper, The Business and Management Review	Ayman Mohamed Nabil Anter Kandil Mohamed A. Ragheb Aiman A. Ragab Mahmoud Farouk	2018	Factors used are below: Relative Advantage, Complexity, Compatibility, Security and Trust, Top Management Support, Technology Readiness and Manpower, Maturity and Performance Issues, Telecommunication Infrastructure, Internet service Provider, Trading Partner support

Challenges of Cloud Computing Adoption From the TOE Framework Perspective	Research Paper, International Journal of e-Business Research	Omar Al Hujran Enas M. Al-Lozi Mutaz M. Al-Debei Mahmoud Maqableh	2018	Focus was more towards challenges than factors with respect to ToE. The challenges discovered in the study are Lack of Regulations, Lack of Standards, Lock-in, Loss of Control, Privacy Concerns, Reliability, Security Concerns
An Integrated Perspective of TOE Framework and Innovation Diffusion in Broadband Mobile Applications Adoption by Enterprises	Research Paper, International Journal of Management, Economics and Social Sciences	Chui - Yu Chiu, Shi Chen, Chun Liang Chen	2017	Factors after Integrating ToE and DOI theories are: Relative Advantage, Complexity, Compatibility, Trialability, observability, Information Intensity, Management support, Employee Knowledge, Absorptive capability, Competitive Pressure, Business Partner, External support, Government Support
Adoption of software as a service in Indonesia: Examining the influence of organizational factors, Science Direct, Information & Management	Research Paper, Information & Management	Van de Weerd, I, Ivonne Sartika Mangula, Sjaak Brinkkempr	2016	TOE framework is used but specifically to organizational context. Determinants of SaaS adoption identified are. - Top management support - Organizational readiness - Organizational size
Integrating TAM, TPB and TOE frameworks and expanding their characteristic constructs for e-commerce adoption by SMEs	Research Paper, Journal of Science and Technology Policy Management	Hart Okorie Awa, Ojiabo Ukoha Ojiabo, Bartholomew Chinweuba Emecheta	2015	Integrated framework using scientific models like TAM, TPB and TOE is used. The Factors used for studying e-commerce adoption are: Scope of Business Operations, Firm's Size, Organization Mission, Facilitating Conditions (TAM), Individual Difference Factors(TAM), Social Influence or Subjective Norms (TAM), Perceived Usefulness (TAM), Perceived Ease of Use (TAM), Perceived Behavioral Control(TPB), Perceived Service Quality, Consumer Readiness, Competitive Pressure, Trading Partners' Readiness, Perceived Trust

Understanding determinants of cloud computing adoption using an integrated TAM-TOE model	Research Paper, Journal of Enterprise Information Management	Hemlata Gangwar, Hema Date	2015	The Factors used in research study after Integrating TAM and TOE theories are: Relative advantage(TOE), Compatibility(TOE), Complexity(TOE), organizational competency(TOE), Top management support(TOE), Training and education(TOE), Competitive pressure(TOE), Trading partner support(TOE), Perceived ease of use(TAM), Perceived usefulness(TAM)
The adoption of software-as-a-service: an Indonesian case study	Research Paper, Proceeding of PACIS, Business, Computer Science	Mangula, I.S., Van de Weerd, I., Brinkkemper	2014	TOE framework is used to study the adoption behavior. The factors used in this study are Relative Advantage, Compatibility, Complexity, Trialability, Observability, Organization Readiness, Top Management Support, Market Pressure, Market Competition, Vendor Marketing Effort, Trust in Vendor, Government Support
Factors influencing the adoption of cloud computing by small and medium enterprises in developing economies,	Research Paper, International Journal of Emerging Science Engineering	Yeboah-Boateng, E.O., Essandoh, K.A.	2014	TOE Framework is used to study the adoption behavior. The factors used in this study are Trialability of Cloud Services, Existence of Required IT Infrastructure and Resources, Compatibility with Existing Systems, Strength of In-built Security Systems, Learning Capability of Employees, Limited Technical Knowledge about Similar Technologies, Non-performance of Cloud Services to support Operations, Top Management Support and Involvement, Resistance towards New Technologies, Conformity with Work Culture and Style, Impact of Organizational Structure and Size, First Adopters in Our Industry, Adequate User and Technical Support from Provider,

				Choice of Skilled and Expert Cloud Vendors, Influence of Market Scope, The Nature of Industry, Relationship with Providers, Government and Competitors
Security Analysis in the Migration to Cloud Environments	Research Paper, Future Internet	David G. Rosado, Rafael Gomez, Daniel Mellado and Eduardo Fernandez-Medina	2012	Analysis of Data Security in migrating to cloud are explored. The Migration process identified is - Look for an established vendor with a track record - Does the project really need to be migrated? - Consider data security - Data transfer - Data storage and location - Scaling - Service level guarantees - Upgrade and maintenance schedules - Software architecture - Check with the lawyers
Adoption of the cloud business model in Indonesia: triggers, benefits, and challenges	Research Paper, IIWAS 12: The 14th International Conference on Information Integration and Web-based Applications & Services	Mangula, I.S., Van de Weerd, I., Brinkkemper, S.	2012	In this study, Triggering factors, benefits and challenges are identified for adoption of cloud business model. - Triggering Factors are identified which are Demand, Cloud phenomenon, Lower demand for hardware procurement, Cloud extensive market, Business portfolio alignment, Business enhancement, Recurrent business revenues - Benefits Identified are Positive trend in revenue gains, Enlargement of customer base, strengthening of customer's dependency, Business continuity, Increase in operational expense efficiency - Challenges identified are Security issues, Low speed of internet connection in rural areas, Cost expensive bandwidth services and hardware procurement, Slow user adoption, Business analysis capability, Users' anxiety, Lack of

				knowledge on cloud computing business model, Partnership opportunity
Data security and privacy protection issues in cloud computing	Research Paper, IEEE, 2012 International Conference on Computer Science and Electronics Engineering	Chen, D., Zhao, H	2012	In this research study Data Security and Privacy protections issues are identified and they are: Data Life Cycle, Data Generation, Data Transfer, Data Use, Data Share, Data Storage, Data Archival, Data Destruction
Mobile banking adoption: Application of diffusion of innovation theory	Research Paper, Journal of Electronic Commerce Research	Al-Jabri, I. M. & Sohail, M. S.	2012	Diffusion of Innovation Framework is used to study the adoption behavior. The factors used in this study are Relative Advantage, Complexity, Compatibility, Trialability, Observability, Perceived Risk
Cloud Computing adoption by SMEs in the North East of England	Research Paper, Journal of Enterprise Information and Management	Y. Alshamaila, S. Papagiannidis, F. Li	2012	TOE framework is used to study the adoption behavior. The factors used in this study are Relative Advantage, Uncertainty, Compatibility, Complexity, Trialability, Observability, Size, Top Management Support, Innovativeness, Prior IT experience, Competitive pressure, Industry, Market scope, Supplier efforts and external computing support
Cloud computing concerns in developing economies	Research Paper, Proceedings of the 9th Australian Information Security Management Conference	Mujinga, M., Chipangura, B.	2011	Security issues in cloud computing are discussed. The concerns are as follows: Service Availability, Identity Management, Data and Application Security, Privacy, Service Level Agreement Negotiation
E-business value creation in Small and Medium Enterprises: A US study using the TOE framework	Research Paper, International Journal of Electronic Business	Wen, K. W., & Chen, Y	2010	TOE framework is used in the study. The factors used in this study are Relative Advantage, Compatibility, Complexity, Trialability, Observability, Size, Top Management Support, Prior IT experience, organizational readiness, Competitive pressure, Industry,

				Market scope, Supplier efforts and external computing support
An Analysis of the Technology Acceptance Model in Understanding University Students' Behavioral Intention to Use e-Learning	Research Paper, Educational Technology & Society	Sung Youl Park	2009	TAM model is used in studying the behavioral intention to use e-learning. TAM 2 Variables used in the study are Perceived usefulness, Attitude, Behavioral intention, e-learning self-efficacy, Subjective norm, System accessibility
The adoption of e-Commerce communications and applications technologies in small businesses in New Zealand	Research Paper, IEEE/ACS International Conference on Computer Systems and Applications	Al-Qirim, N.	2008	ToE framework is used in research study for adopting e-commerce applications. The factors used are Relative Advantage, Compatibility, Complexity, Top Management Support, organizational readiness, Informational intensity, managerial time, Competitive pressure, Government pressure, Consumer readiness, support from technology vendors

Based on the literature review and considering the existing scientific models, the researcher has developed a conceptual framework for this research study. The conceptual framework is developed according to the viewpoint of different stakeholders like an economic buyer, technical buyer, and end user. The scope of this research is as follows:

- Organizations with a new requirement to buy enterprise software products can adopt either an on-premise model or a cloud model of the software product.

- Organizations with an on-premise software product model want to adopt a cloud computing model.

- Organizations that adopted the cloud model want to move back to the on-premise model.

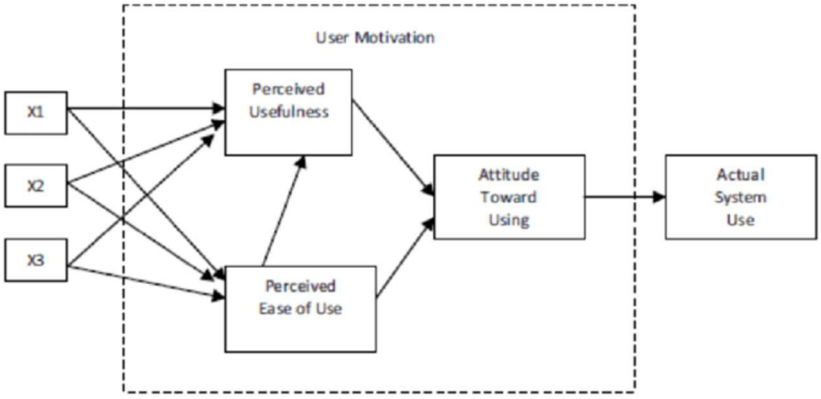
2.4. Current Models and Theories

In the previous sections, the researcher presented the literature review related to this research study. Researchers have used different theories and frameworks to explain consumer's behavior regarding the adoption of new technologies and their intention to use them. These included, but were not limited to, the Technology Acceptance Model (TAM), the theory of Diffusion of Innovations (DOI), TOE (Technology, Organization, and Environmental), DEMTEL (Decision Making Trial and Evaluation Laboratory), the Theory of Task-technology fit (TTF), the Theory of Reasonable Action (TRA), Theory of Planned Behavior (TPB).

2.4.1. Technology Acceptance Model

The technology acceptance model (TAM) is a theory of information systems or technologies that shows how users conclude to accept and use technology, (Davis, 1985). The actual system use is the point where the end-user uses the technology. Behavioral intention is a factor that leads end users to use the technology. Behavioral intention is influenced by the attitude which is the common idea of technology.

Figure 2.4.1-1: Original Technology Acceptance Model
Source: Davis, (1985)



Davis (1985), suggests that when users are presented with a new technology, there will be a number of factors that influences their decision to adopt and use it. The factors are Perceived usefulness and perceived ease of use.

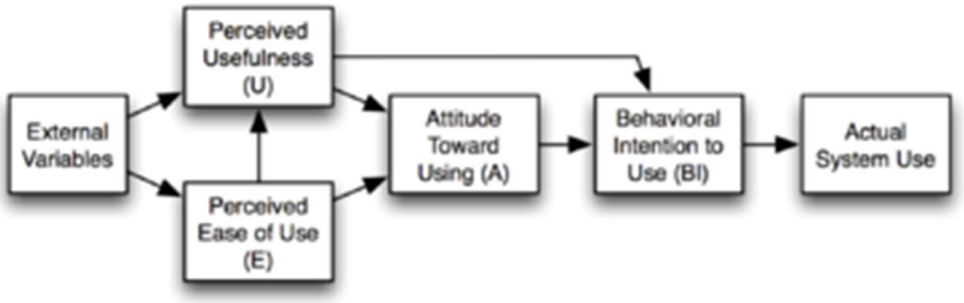
- Perceived usefulness (PU) – Davis (1985), defines this as "the degree to which a person believes that using a particular system would enhance his or her job performance". It means whether or not someone perceives that technology to be useful.

- Perceived ease-of-use (PEOU) – Davis (1985), defines this as "the degree to which a person believes that using a particular system would be free from effort". If the technology is easy to use, then the barriers are conquered. If it's not easy to use and the interface is complicated, no one has a positive attitude toward it.

The belief of the person towards a system may be influenced by other factors referred to as external variables in TAM External variables such as social influence is an important factor in determining the attitude, (Lai, 2017). When these things (TAM) are in place, people will have the attitude and intention to use the technology. However, the perception may change depending on age and gender because everyone is different (Davis, 1989).

Figure 2.4.1-2: First modified version of Technology Acceptance Model (TAM)

Source: Davis et al., (1989)



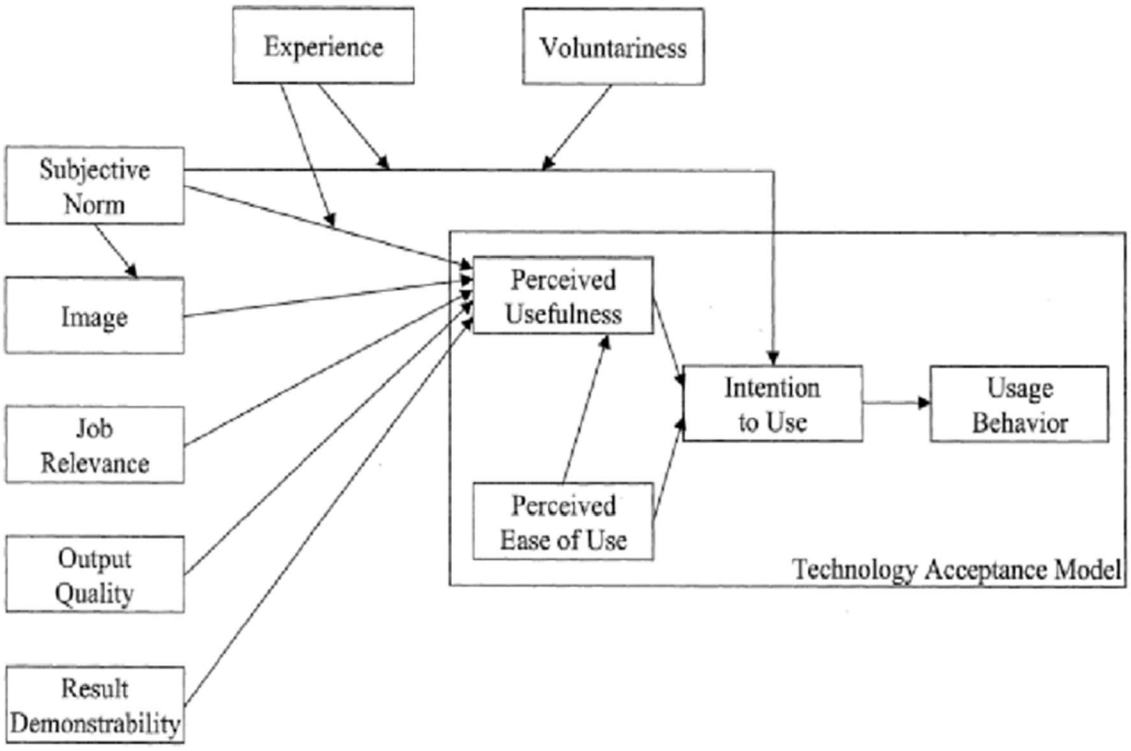
Venkatesh & Davis (2000), extended the original TAM model to explain perceived usefulness and usage intentions in terms of social influence (subjective norms, voluntariness, image) and cognitive instrumental processes (job relevance, output quality, result demonstrability, perceived ease of use). The extended model, referred to as TAM2, was tested in both voluntary and mandatory settings. The results strongly supported TAM2, (Venkatesh & Davis, 2000).

- Subjective norm – This is defined as “An individual's perception that other individuals who are important to him/she consider if he/she could perform a behavior”. This was consistent with the theory of reasoned action (TRA), (Venkatesh & Davis, 2000).

- Voluntariness – This was defined as "the extent to which potential adopters perceive the adoption decision to be non-mandatory" (Venkatesh & Davis, 2000).

Figure 2.4.1-3: Technology Acceptance Model (TAM 2)

Source: Venkatesh & Davis, (2000)



- Image – This was defined as "the degree to which the use of an innovation is perceived to enhance one's status in one's social system" (Moore & Benbasat, 1991).

- Job relevance – This is defined as a personal perspective on the extent to which the target system is suitable for the job (Venkatesh & Davis, 2000).

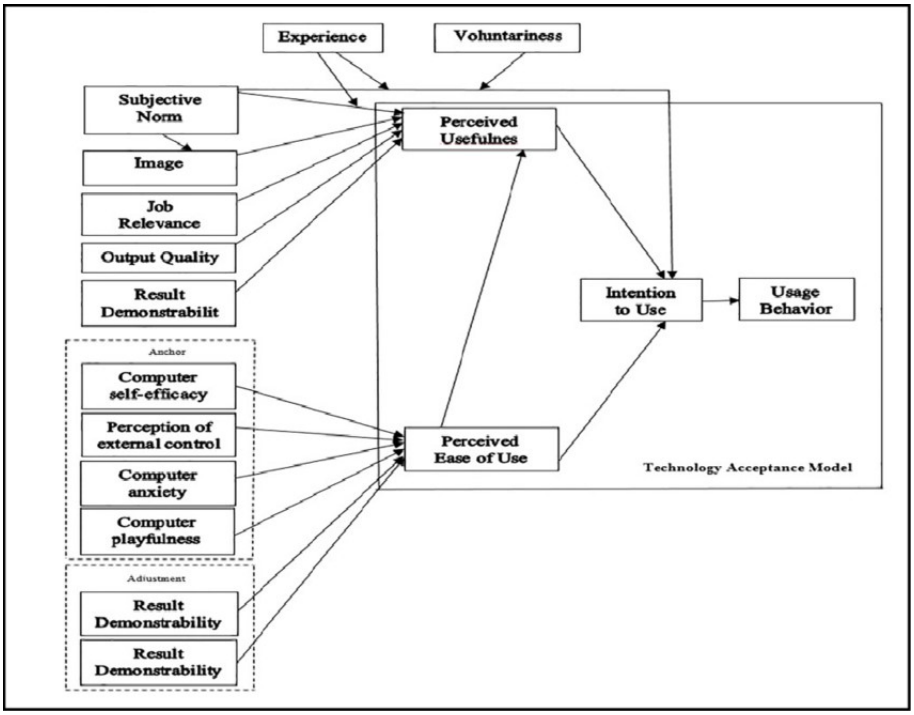
- Output quality – This is defined as the "personal perception of the system's ability to perform specific tasks" (Venkatesh & Davis, 2000).

- Result demonstrability – This is defined as, "The production of tangible results will directly influence the system's usefulness" (Moore & Benbasat, 1991).

Venkatesh & Bala, (2008), combined TAM2 (Venkatesh & Davis, 2000) and the model of the determinants of perceived ease of use (Venkatesh & Davis, 2000), and developed an integrated model of technology acceptance known as TAM3 shown in Figure 2.4.1-3, (Lai, 2017). The authors developed the TAM3 using the four different types including individual differences, system characteristics, social influence, and facilitating conditions which are determinants of perceived usefulness and perceived ease of use, (Lai, 2017). In the TAM3 research model, the perceived ease of use to perceived usefulness, computer anxiety to perceived ease of use, and perceived ease of use to behavioral intention was moderated by experiences. The TAM3 research model was tested in real-world settings of IT implementations, (Lai, 2017).

Figure 2.4.1-4: Technology Acceptance Model (TAM 3)

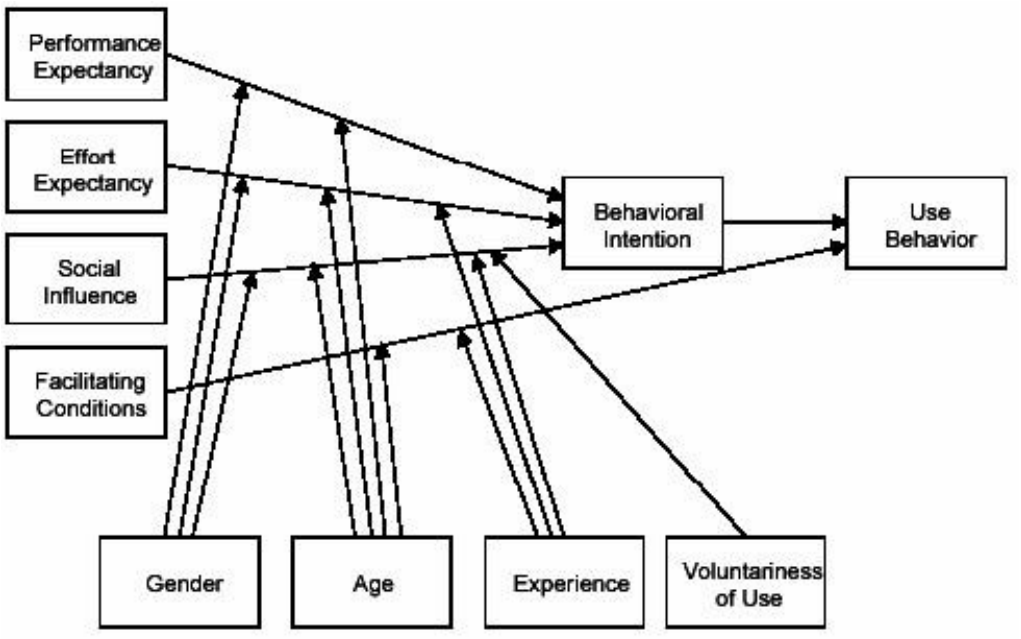
Source: (Venkatesh & Bala, 2008)



Venkatesh et al., (2003), studied from the previous models/theories and formed Unified Theory of Acceptance and Use of Technology (UTAUT) shown in Figure 2.4.1-5

Figure 2.4.1-5: Unified Theory of Acceptance and Use of Technology (UTAUT)

Source: Venkatesh et al., (2003)



The UTAUT has four predictors of users' behavioral intention and there are performance expectancy, effort expectancy, social influence, and facilitating conditions, (Lai, 2017). The five similar constructs including perceived usefulness, extrinsic motivation, and job outcome expectations form the performance expectancy in the UTAUT model while effort expectancy captures the notions of perceived ease of use and complexity. As for the social context, Venkatesh et al., (2003) validation tests found that social influence was not significant in voluntary contexts, (Lai, 2017).

2.4.2. Diffusion of Innovation

Diffusion of Innovation states that Diffusion is the process by which an innovation is communicated through certain channels over a period among the members of a social system. An innovation is an idea, practice, or object that is perceived to be new by an individual or other unit of adoption. Communication is a process in which participants create and share information with

one another to reach a mutual understanding (Rogers, 2003). The end result of this diffusion is that people, as part of a social system, adopt a new idea, behavior, or product (LaMorte, 2019a). Adoption means that a person does something different than what they had previously (i.e., purchase or use a new product, acquire and perform a new behavior, etc.). The key to adoption is that the person must perceive the idea, behavior, or product as new or innovative. It is through this that diffusion is possible, (LaMorte, 2019a).

In any social system, the adoption of a new idea, process, or product does not happen simultaneously; rather it is a process whereby some people are more apt to adopt the innovation than others, (LaMorte, 2019a). Researchers found that different people will have different characteristics and it is important to understand these characteristics while promoting innovation among the target population, (LaMorte, 2019a). There are five established adopter categories, and while the majority of the general population tends to fall in the middle categories, it is still necessary to understand the characteristics of the target population. When promoting an innovation, there are different strategies used to appeal to the different adopter categories, (LaMorte, 2019a).

- Innovators - These are people who want to be the first to try the innovation. They are venturesome and interested in new ideas. These people are very willing to take risks and are often the first to develop new ideas. Very little, if anything, needs to be done to appeal to this population, (LaMorte, 2019a).

- Early Adopters - These are people who represent opinion leaders. They enjoy leadership roles and embrace change opportunities. They are already aware of the need to change and so are very comfortable adopting new ideas. Strategies to appeal to this population include how-to manuals and information sheets on implementation. They do not need the information to convince them to change, (LaMorte, 2019a).

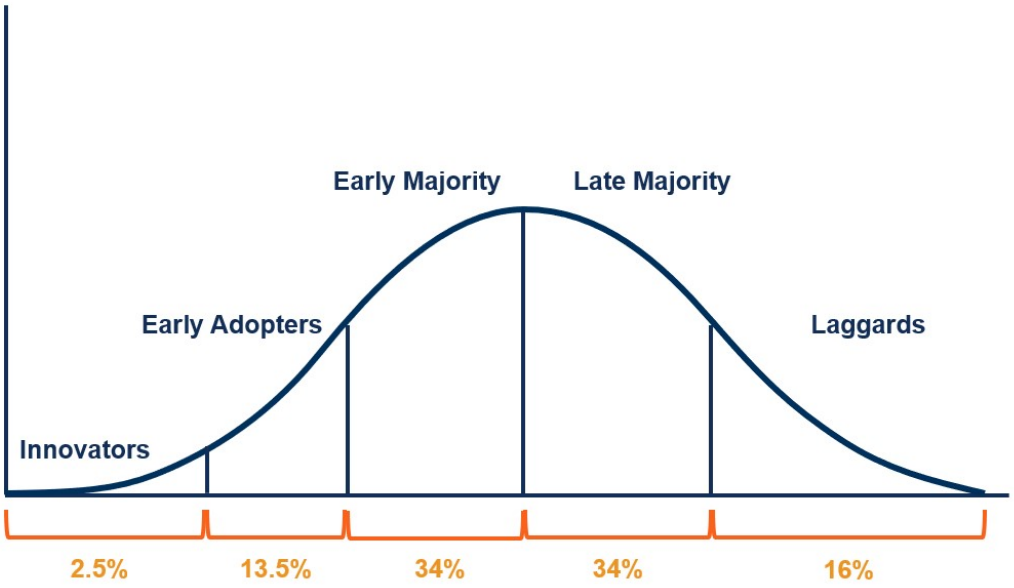
- Early Majority - These people are rarely leaders, but they do adopt new ideas before the average person. That said, they typically need to see evidence that the innovation works before they are willing to adopt it. Strategies to appeal to this population include success stories and evidence of the innovation's effectiveness, (LaMorte, 2019a).

- Late Majority - These people are skeptical of change and will only adopt an innovation after it has been tried by the majority. Strategies to appeal to this population include information on how many other people have tried the innovation and have adopted it successfully, (LaMorte, 2019a).

- Laggards - These people are bound by tradition and very conservative. They are very skeptical of change and are the hardest group to bring on board. Strategies to appeal to this population include statistics, fear appeals, and pressure from people in the other adopter groups, (LaMorte, 2019a).

Figure 2.4.2 - 1: DOI – Adaptor Categories

Source: Rogers, (2003)



The stages by which a person adopts an innovation and whereby diffusion is accomplished include awareness of the need for an innovation, decision to adopt (or reject) the innovation, initial use of the innovation to test it, and continued use of the innovation, (LaMorte, 2019a). There are five main factors that influence the adoption of an innovation, and each of these factors is at play to a different extent in the five adopter categories (LaMorte, 2019a).

- Relative Advantage - The degree to which an innovation is seen as better than the idea, program, or product it replaces (LaMorte, 2019a).

- Compatibility - How consistent the innovation is with the values, experiences, and needs of the potential adopters (LaMorte, 2019a).

- Complexity - How difficult the innovation is to understand and/or use (LaMorte, 2019a).

- Trialability - The extent to which the innovation can be tested or experimented with before a commitment to adopt is made (LaMorte, 2019a).

- Observability - The extent to which the innovation provides tangible results (LaMorte, 2019a).

2.4.3. Technology-Organization-Environment Framework

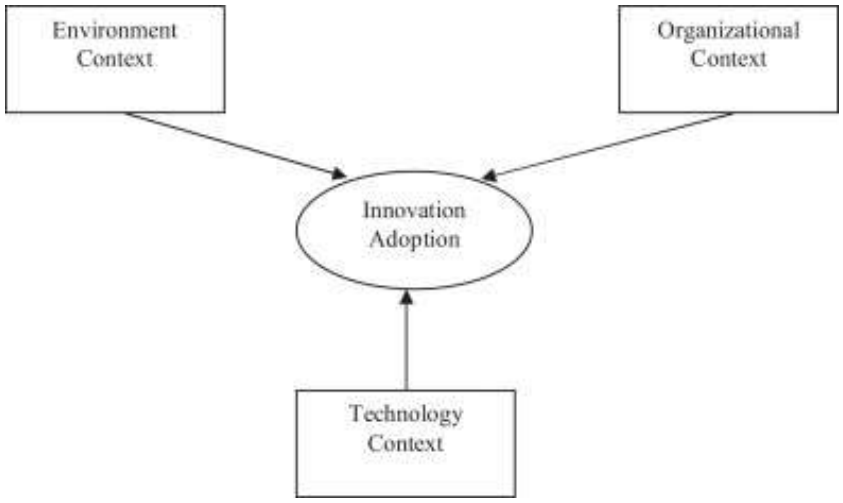
The technology–organization–environment (TOE) framework is described in Tornatzky and Fleischer's The Processes of Technological Innovation (1990). The book describes the entire process of innovation – stretching from the development of innovations by engineers and entrepreneurs to the adoption and implementation of those innovations by users within the context of a firm (Baker, 2012). The TOE framework represents one segment of this process – how the firm context influences the adoption and implementation of innovations (Baker, 2012). The TOE framework is an organization-level theory that explains that three different elements of a firm's context influence adoption decisions. These three elements are the technological context, the organizational context, and the environmental context (Baker, 2012).

2.4.3.1 Technology Context:

The technological context of innovation describes its technical characteristics. There are two types of technological factors that influence organizations to adopt IT innovation. They are internal and external technological factors. Internal technological factors are existing technologies in the organization and external technology factors are those which are available in the marketplace (Al-Hujran et al., 2018).

Figure 2.4.3 - 1: TOE Framework

Source: (Tornatzky L & Fleischer M, 1990)



The most significant technological factors that influence an organization's decision to adopt innovations are Relative advantage, Compatibility, Complexity, Trialability, and Observability (Alshamaila et al., 2013; Hsu, 2013; Low et al., 2011; I. Mangula et al., 2014; Oliveira et al., 2014).

- Relative advantage is defined as "The extent to which a new idea or process is observed as better than the technology, or product or service it replaces, (Rogers, 2003; Tornatzky L & Fleischer M, 1990)".

- Compatibility is defined as "The extent to which a new idea or process is perceived as consistent with existing values, adopter needs, and past experiences, (Rogers, 2003; Tornatzky L & Fleischer M, 1990)".

- Complexity is defined as "The extent to which a new idea or process is perceived as relatively difficult to understand and use, (Rogers, 2003; Tornatzky L & Fleischer M, 1990)".

- Trialability is defined as "The extent to which an IT innovation may be evaluated on a limited basis, (Rogers, 2003; Tornatzky L & Fleischer M, 1990)".

- Observability is defined as “The extent to which a customer can observe the innovation and its positive effects is known as observability, (Rogers, 2003; Tornatzky L & Fleischer M, 1990)”.

2.4.3.2 Organizational Context:

Organizational context refers to the characteristics of an organization that influence the adoption of IT innovation by the firms. They are top management support, organizational readiness, organizational size, the Awareness level of IT employees, and Use of existing On-Premise or Cloud Computing infrastructure (Mangula et al., 2012; Oliveira et al., 2014; M. Rehman & KRISHNA, 2018; Weerd et al., 2016). For example, Top management support is an enabler for the adoption of cloud technologies, and Managers with good experience in Cloud computing will adopt it (Weerd et al., 2016).

- Top management support is defined as “the support of top management in adopting IT innovations”. In several studies, it is found that top management support is one of the most influencing factors and enabler in adopting IT innovations, (Sabherwal et al., 2006; Scupola, 2009).

- Awareness level of the IT team: It is classified as basic, intermediate, and high. More the level of awareness, the adoption rate of an IT innovation will be high, (Weerd et al., 2016).

- Availability of the required organizational resources: Organizational readiness is defined as “the availability of organizational resources to adopt new technologies. This is further classified under three headings namely human resources, financial resources, and infrastructure resources”, (Iacovou et al., 1995; Wang & Ahmed, 2009).

- Size of the company or its IT unit: The definition of organizational size according to the world bank is by categorizing the organizations using the number of employees. The categories used are micro-enterprises, with 1 - 9 employees; small enterprises with 10–49 employees; medium enterprises with 50–249 employees and large enterprises, with >250 employees (Kushnir et al., 2010; Wach, 2015). For the research study, organizations have been categorized into two

groups namely small-medium sized organizations with < 249 employees and large organizations with > 250 employees.

Table 2.4.3.2 - 1: Categorization of organizations with respect to number of employees

Category	Size of the organization
Small-Medium	Less than 249
Large	Greater than 250

In addition, researcher also categorized organizations based on their Total Assets, (Selvaraj, 2020)

Table 2.4.3.2 - 2: Categorization of organizations with respect to total assets Definition of MSME revised. Nasscom, (Selvaraj, 2020)

Category	Total Assets in Million (INR)
Small-Medium	Less than 2,500
Large	Greater than 2,500

- Use of existing On-Premise or Cloud Computing infrastructure: "According to Rogers (2003), the adoption of innovation will get affected by experience in using new innovations". In the case of cloud services, users' familiarity with new technologies like cluster computing, and virtualization will have an influence on users' perceptions regarding cloud computing services.

2.4.3.3 Environmental Context:

The environmental context for an organization is the environment in which an organization operates. It consists of multiple stakeholders such as governing board members, business competitors, suppliers, customers, the government, etc. They can influence the organization's decision to adopt an innovation (Rehman & Dr. Rajkumar, 2019). The most used factors which influence the organization's decision are Competitive pressure, Business partner pressure, External support, Support from the Government, Service Level Agreement, Industry Type, and Advice of IT Specialists (Oliveira et al., 2014; Rehman & Dr. Rajkumar, 2019).

- Competitive pressure: It is defined as "The level of pressure felt by the firm from its competitors within the same industry" (Zhu & Kraemer, 2005).

- Business partner pressure: It is defined as "The level of pressure felt by the firm from its trading partners" (Zhu et al., 2003).

- External support: It is defined as "The availability of support for implementing and using innovation. Usually, this support refers to Vendor support for the technology" (Li, 2008).

- Support from the Government: To adopt new technologies in the form of subsidies, discounts, and regulatory compliances (Dahnil et al., 2014).

- Service Level Agreement: The contract between a service provider and its internal or external customers that documents what services the provider will furnish and defines the service standards the provider must meet (Rosencrance et al., 2014).

- Industry: Levenburg et al. (2006) have defined that "the adoption of IT innovation by an organization can be influenced by the industry in which it operates".

- The advice of IT specialists and consultants: Suggestions made by IT advisors and consultants of the organization (Yeboah-Boateng et al., 2014).

- Choice of skilled vendors: Vendor or partner that sells both On-premise or Cloud computing models of the software product (Yeboah-Boateng et al., 2014).

2.4.4. Decision Making Trial and Evaluation Laboratory

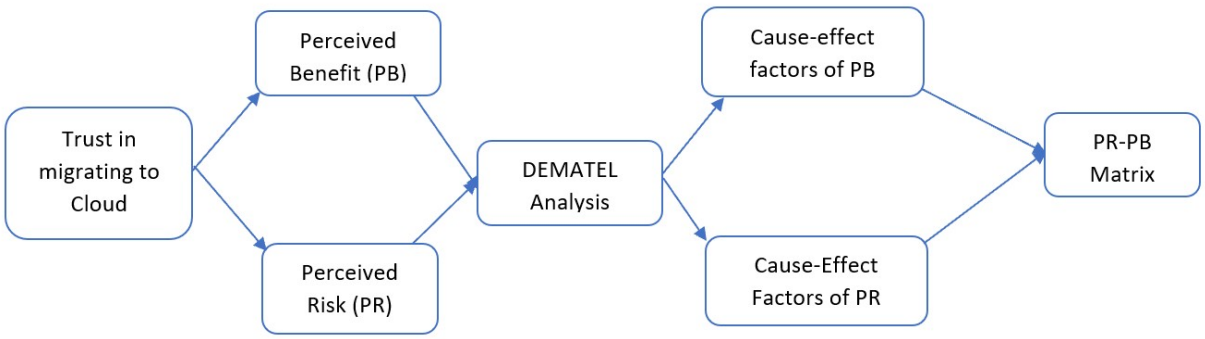
Decision Making Trial and Evaluation Laboratory (DEMATEL) can divide a set of factors into cause and effect groups with a causal diagram (Gabus & Fontela, 1972, 1973).

Wu et al., (2011), have emphasized that trust is the key factor of success in the adoption of any type of e-commerce i, e.. when there is more than one choice of e-commerce products are available. (Deutsch, (1962) states that trust will get established when perceived benefits surpass perceived risks. Wu et al., (2011) have explained the eight perceived benefit factors identified are pay only for what you use, easy and fast to deploy to end-users, monthly payments, encourages standard

systems, requires less in-house IT staff and costs, always offers latest functionality, sharing systems with partners is simpler, seems like the way of future and the seven perceived risk factors identified are data locality and security, network and web application security, data integrity and segregation, authentication and authorization, virtualization vulnerability, data access and backup, and identity management and sign-on process, (Subashini & Kavitha, 2011).

Figure 2.4.4-1: DEMATEL Framework

Source:Wu et al., (2011)



2.4.4.1 Perceived Benefit Factors

The factors included in Perceived Risks are

- Pay only for what you use: Pay-as-you-go cloud computing (PAYG cloud computing) is a payment method for cloud computing that charges based on usage (Rouse, 2015).

- Monthly payments: Customers pay on a per-use basis, typically by the hour, week, or month (Rouse, 2015).

- Requires less in-house IT staff, and costs: Castillo, (2020) has explained that cloud computing no longer needs a team to deliver your computing and IT needs. When you do not have an in-house team, you don't need to worry about the compensation costs for the staff as well as the benefits.

- Easy and fast to deploy to end-users: One of the key benefits of Cloud applications is, It is agile, with ease and speed of deployment (Ram et al., 2011).

- Encourages standard systems: One of the key benefits of Cloud applications is, The use of standard technology is encouraged and facilitated (Ram et al., 2011).

- Always offers latest functionality: One of the key benefits of Cloud applications is, The latest technology is always delivered (Ram et al., 2011).

- Sharing systems with partners simpler: Burgard, (2020) says, "The ability to communicate and share via cloud computing can enhance the quality of work produced and decrease the amount of time it takes to complete projects".

- Data Availability is defined as, “It is the responsibility of providers to make data available for 24*7 days without delay” (Subashini & Kavitha, 2011).

- Data Accessibility is defined as “It is the control mechanism of data access which confirms secure authorized access to data and prevents unauthorized access of data” (Subashini & Kavitha, 2011).

2.4.4.2 Perceived Risks Factors

The factors included in Perceived Risks are

- Data Security is defined as “Data is secured from natural and man-in-the-middle attacks” (Subashini & Kavitha, 2011).

- Data Integrity is defined as “protection of data from unauthorized access, modification, and deletion from unauthorized user, hackers, intruders. Integrity ensures that data has not been tampered during its journey from source to destination. The service provider must guarantee that data will be transmitted in a secure channel without getting tampered” (Linthicum, 2009; Kandukuri et al., 2009).

- Data Privacy is defined as “The provider must guarantee that data is segregated at the physical layer for each user. The service provider must have the intelligence to isolate data among different users in its services” (Subashini & Kavitha, 2011).

- Data backup is defined as "Provider must ensure to its customers that the backup of stored data is taken at regular interval and is available for quick restore. If disasters like data loss or fire, or Server crash happen then data should be made available from the disaster recovery centre of data” (Chen & Zhao, 2012).

- Data Locality is defined as follows, “Service provider must ensure that storing and processing of data will be within jurisdiction limits and the service level agreement will comply to the policies of judiciary systems, security management, and data privacy” (Chen & Zhao, 2012).

- Virtualization vulnerability is defined as “Virtualization provisions a user to create, share, copy, roll back, migrate virtual machines. It also allows them to run different types of software applications” (Catteddu, 2010). Virtual machine technology does not offer perfect isolation of data and machines. Research on Virtualization security and management of virtual machine’s environment is still in progress. Researchers are doing continuous work to enhance security measures and the performance of virtual machines (Subashini & Kavitha, 2011).

- Identity Management is a process of assigning Identity (ID) to an individual or process. The process then verifies the credentials and gives access to resources in the system. The process also enforces restrictions on already established identities (Subashini & Kavitha, 2011).

- Single Sign-on process is defined as, “Authentication to one application gives authorization to other applications. SAML (Security Assertion Markup Language) and WS-Fed (Web Service Federation) technologies are widely used for the single sign-on process. The alternative to WS-Fed and SAML is VPN SSO which is a Single Sign-on solution implemented using a Virtual Private Network tunnel” (Jansen & Grance, 2011). An end user proves his identity to one

SAML or WS-Fed supported software application and the same user can access other software applications enabled with SAML, WS-Fed without proving his identity again.

- Application Sensitivity: There are essentially four types of intellectual property rights relevant to software: patents, copyrights, trade secrets, and trademarks (Eric, 1995). Each affords a different type of legal protection. Patents, copyrights, and trade secrets can be used to protect the technology itself. Trademarks do not protect technology, but the names or symbols used to distinguish a product in the marketplace (Eric, 1995).

- Auto-Scaling of computational resources charges: Dynamic resizing is a feature that allows the server to resize the virtual machine to fill the new requirement of resources. When a virtual machine is under-provisioning or over-provisioning, dynamic resizing can utilize to overcome these problems (Hung et al., 2012).

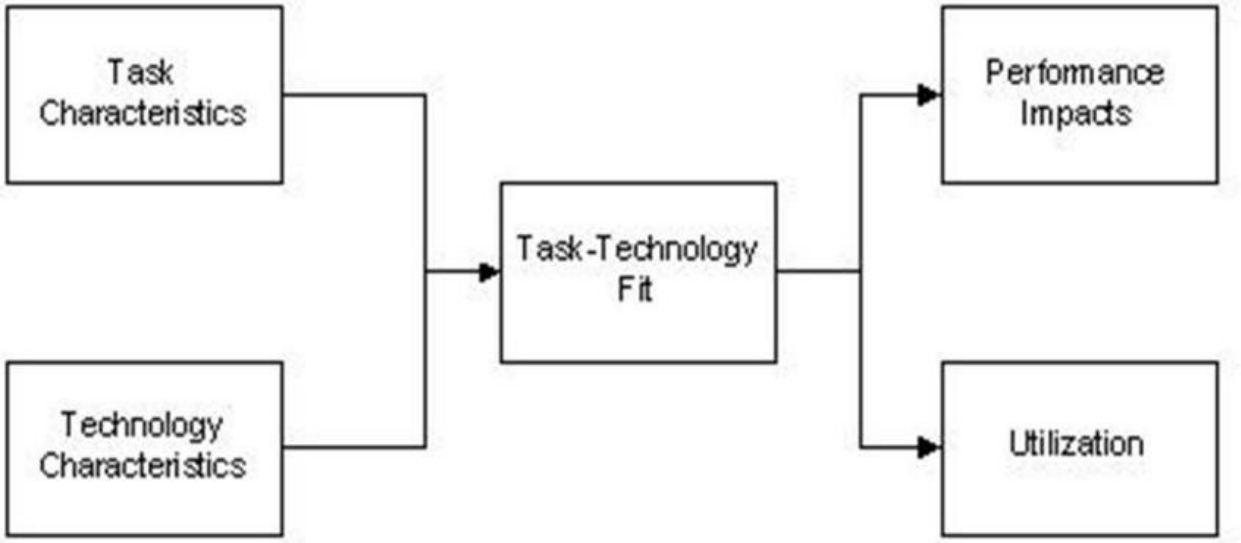
- Data Storage charges: This is often called cloud storage and defined as "data stored remotely without the need to retain it on physical On-premise hardware", (Millman, 2020). It consists of Capacity costs, Networking, and egress costs, Operations cost, and Disaster recovery costs.

2.4.5. Task Technology fit

Goodhue & Thompson (1995), explained the theory of Task-technology fit (TTF). It states that Information Technology is likely to have a more positive impact on individual performance and it can be used if the capabilities of IT match the task assigned to the user. There are eight factors that can measure task-technology fit and they are quality, locatability, authorization, compatibility, ease of use/training, production timeliness, systems reliability, and relationship with users, (Goodhue & Thompson, 1995). The improved job performance and effectiveness of a user can be attributable to the system under investigation. This can be found with the help of TTF measures in conjunction with utilization.

Figure 2.4.5 -1: Task-Technology Fit

Source: Goodhue & Thompson, (1995)



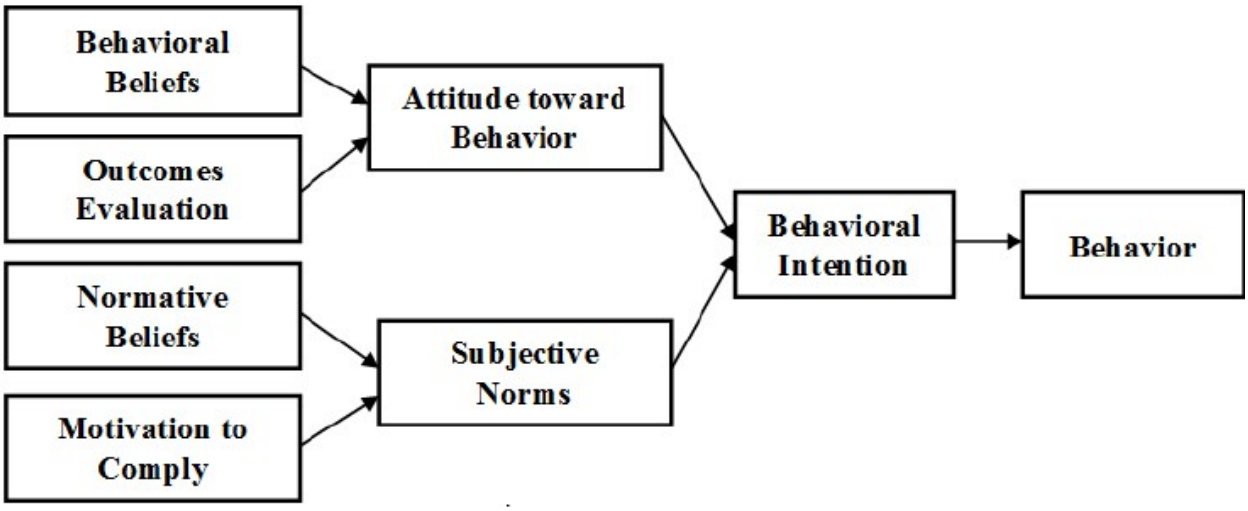
2.4.6. Theory of Reasoned Action

Fishbein & Ajzen (1975) developed the theory of reasoned action, the theory is derived from their previous research in attitude theories, persuasion models, and social psychology. Fishbein's theories advocated the relationship between attitude and behaviours (the A-B relationship). The goal of the theory of reasoned action is to explain the relationship between attitudes and behaviours within human action. The theory will predict the behaviour of an individual based on their pre-existing attitudes and behavioural intentions. An individual will engage himself in a particular behaviour based on the result the individual is expecting will come as a result of performing the behaviour.

Karen et al., (2015) explain TRA as a person's intention to perform a behaviour is the main predictor of whether or not they actually perform that behaviour. Additionally, the normative component (i.e. social norms surrounding the act) also contributes to whether or not the person will actually perform the behaviour. According to the theory, the intention to perform a certain behaviour precedes the actual behaviour, (Ajzen & Madden, 1986).

Figure 2.4.6 -1: Theory of Reasoned Action

Source: Fishbein & Ajzen, (1975)



This intention is known as behavioural intention and comes as a result of a belief that performing the behaviour will lead to a specific outcome. Behavioural intention is important to the theory because these intentions "are determined by attitudes to behaviours and subjective norms" (Colman, 2015). TRA suggests that stronger intentions lead to increased effort to perform the behaviour, which also increases the likelihood for the behaviour to be performed. TRA suggests that stronger intentions lead to increased effort to perform the behaviour, which also increases the likelihood for the behaviour to be performed.

TRA can be represented with the following equation:

BI = (AB)W 1 + (SN)W2

where:

BI represents behavioural intention

AB represents individual's attitude toward performing the behaviour

W represents derived weights

SN represents individual's subjective norm related to performing the behaviour

2.4.7. Theory of Planned Behavior

The Theory of Planned Behaviour (TPB) started as the Theory of Reasoned Action in 1980 to predict an individual's intention to engage in a behaviour at a specific time and place, (LaMorte, 2019). The theory was intended to explain all behaviours over which people have the ability to exert self-control. The key component of this model is behavioural intent; behavioural intentions are influenced by the attitude about the likelihood that the behaviour will have the expected outcome and the subjective evaluation of the risks and benefits of that outcome, (LaMorte, 2019).

The TPB states that behavioural achievement depends on both motivation (intention) and ability (behavioural control), (LaMorte, 2019). It distinguishes between three types of beliefs - behavioural, normative, and control. The TPB is comprised of six constructs that collectively represent a person's actual control over the behaviour, (LaMorte, 2019).

- Attitudes - LaMorte (2019) defined this as "the degree to which a person has a favourable or unfavourable evaluation of the behaviour of interest. It entails a consideration of the outcomes of performing the behaviour".

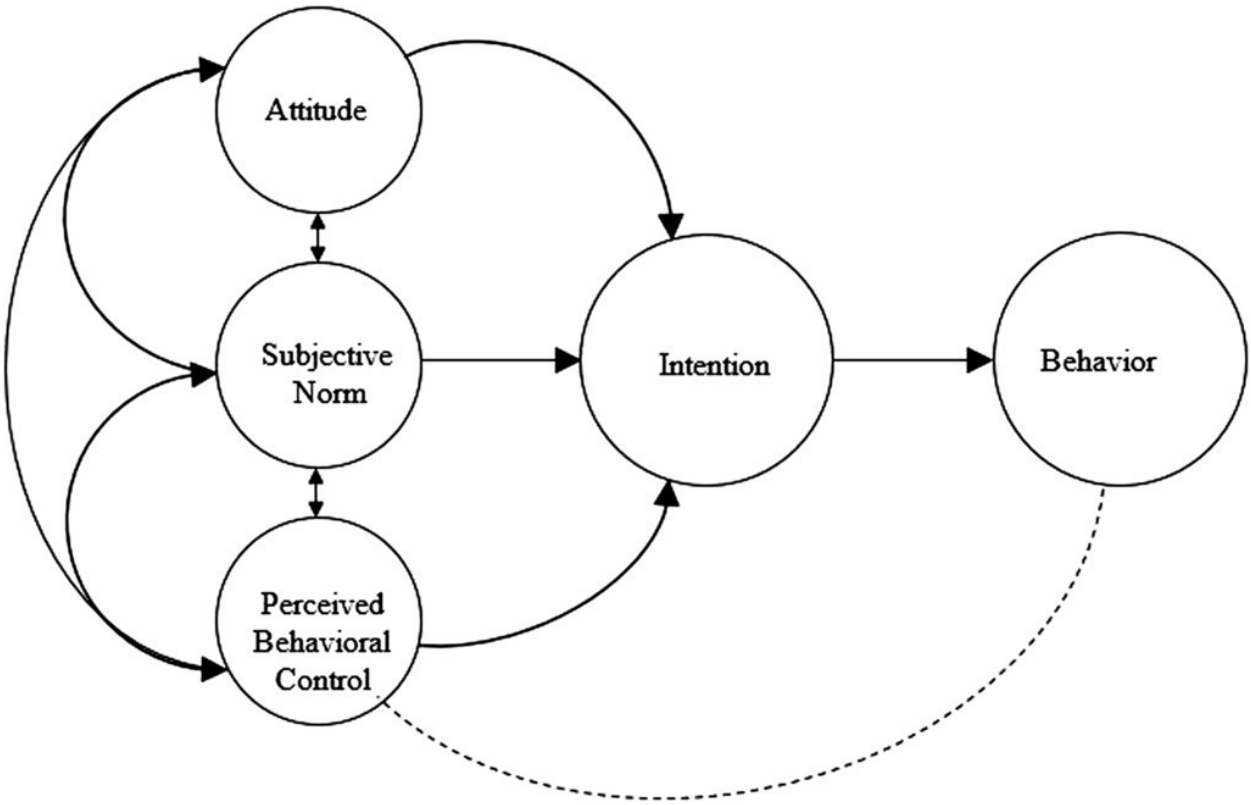
- Behavioural intention - LaMorte (2019) defined this as "motivational factors that influence a given behaviour where the stronger the intention to perform the behaviour, the more likely the behaviour will be performed".

- Subjective norms - LaMorte (2019) defined this as "the belief about whether most people approve or disapprove of the behaviour. It relates to a person's beliefs about whether peers and people of importance to the person think he or she should engage in the behaviour".

- Social norms - LaMorte (2019) defined this as "the customary codes of behaviour in a group or people or larger cultural context. Social norms are considered normative, or standard, in a group of people".

Figure 2.4.7-1: Theory of Planned Behaviour

Source: Ajzen, (1991)



- Perceived power - LaMorte (2019) defined this as “the perceived presence of factors that may facilitate or impede the performance of a behaviour. Perceived power contributes to a person's perceived behavioural control over each of those factors”.

- Perceived behavioural control - LaMorte, (2019) defined this as a “person's perception of the ease or difficulty of performing the behaviour of interest. Perceived behavioural control varies across situations and actions, which results in a person having varying perceptions of behavioural control depending on the situation. This construct of the theory was added later and created the shift from the Theory of Reasoned Action to the Theory of Planned Behaviour”.

2.5 Research Gaps

Based on the findings from the literature review, the following are the research gaps identified.

1. To date, the research is done on the adoption of cloud computing models whereas organizations have the challenge to adopt either on-premise or cloud computing models. There is a need to study the behaviors of organizations in taking the decision to adopt the appropriate model of the enterprise software product.

2. For the organizations who already adopted either a cloud computing model or an on-premise model of the software product. The challenge is to move from one deployment model to another and the factors that influence this kind of adoption are different. There is a need to study the behaviors of organizations in taking the decision to adopt from one deployment model to another deployment model of the enterprise software product.

3. Researchers are using DOI, TOE, TAM, TPB, TRA, TTF, and DEMATEL scientific models to study adoption behavior. There is a need for an integrated approach to study the influence of various factors depending on buyer and scope.

4. There is a need to study the factors influencing the adoption of the cloud model and the readoption of the on-premise model by organizations.

2.6. Developing a Conceptual Framework

After conducting a literature review in the field of adoption behaviour for innovations like e-commerce, cloud computing, digital technology, mobile broadband, and telematics specifically around cloud computing adoption, a conceptual framework is developed to incorporate several areas that have been researched in the literature extensively (refer to Section 2.3). However, in terms of researching these concepts about their influence on adopting enterprise software product deployment models like On-premise or cloud computing, the literature provides little or no direction with reference to different stakeholders like an economic buyer, technical buyer, end user, and with different scopes.

The research frameworks like TAM, TTF, TRA, and TPB are more focused on the end user's experience or actual consumers. Nowadays Vendors are developing Software products in such a way that end users will not feel the difference between working on On-Premise or Cloud computing software deployment model. The User Interface will be almost identical for both deployment models of the enterprise software product. For example, Microsoft email server, the On-premise deployment model is an Exchange server where as the Cloud deployment model is office 365. The graphical interface for both deployment models is almost the same. The core variables for TAM are Perceived Ease of Use and Perceived Usefulness. These factors are more centric toward an end user and don't consider the economic buyer's and technical buyer's perspectives. The research framework TTF is more focused on tasks and their technical characteristics. It does not have any coverage on organizational, or environmental characteristics.

Similarly, the other two theories TRA, and TPB are focused on end user's beliefs, and attitudes. Though it also considers subjective norms but does not justify organizational study. Hence these research frameworks TAM, TTF, TRA, and TPB do not justify organizational study. The frameworks DOI, TOE, and DEMATEL covers the viewpoints of different stakeholders like Economic buyer, technical buyer, and end user. Also, they cover all aspects like Technological context, Organizational context, Environmental context, Perceived Benefits, and Perceived Risks. The proposed integrated model considers different stakeholders like an economic buyer, technical buyer, and end user with different scopes.

Economic Buyers are the different stakeholders involved in the decision-making process for adopting the enterprise software product delivery model. The key factor in decision-making for these buyers is cost advantage. The people in this buyer category are CEOs, CIOs, VPs, AVPs, IT Directors, and IT Managers, (Burke, 2022).

Technical Buyers are the different stakeholders involved in the decision-making process for adopting the enterprise software product delivery model. The key factors in decision-making for these buyers are Relative advantage (performance, utilization, system resources), Complexity in deploying and using the product, Data Security, Data Privacy, and Disaster Recovery. The people in this buyer category are IT Directors, IT Managers, and IT Staff, (Burke, 2022).

The end user is the actual consumer of the software product and the key factor for these users is the ease of use, (Burke, 2022). The majority of vendors are developing enterprise software product in such a way that end user will not feel the difference whether he is working on an On-premise or Cloud computing model of the software product. The researcher has just discussed the example of the Microsoft email server above. The user interface, look and feel of both on-premise (Microsoft Exchange server) and cloud deployment model (Microsoft Office 365) is almost the same and identical. Therefore, the people responsible for decision-making on behalf of end users are the technical buyer in the organizational study. However, this is not the case when it comes to consumer study.

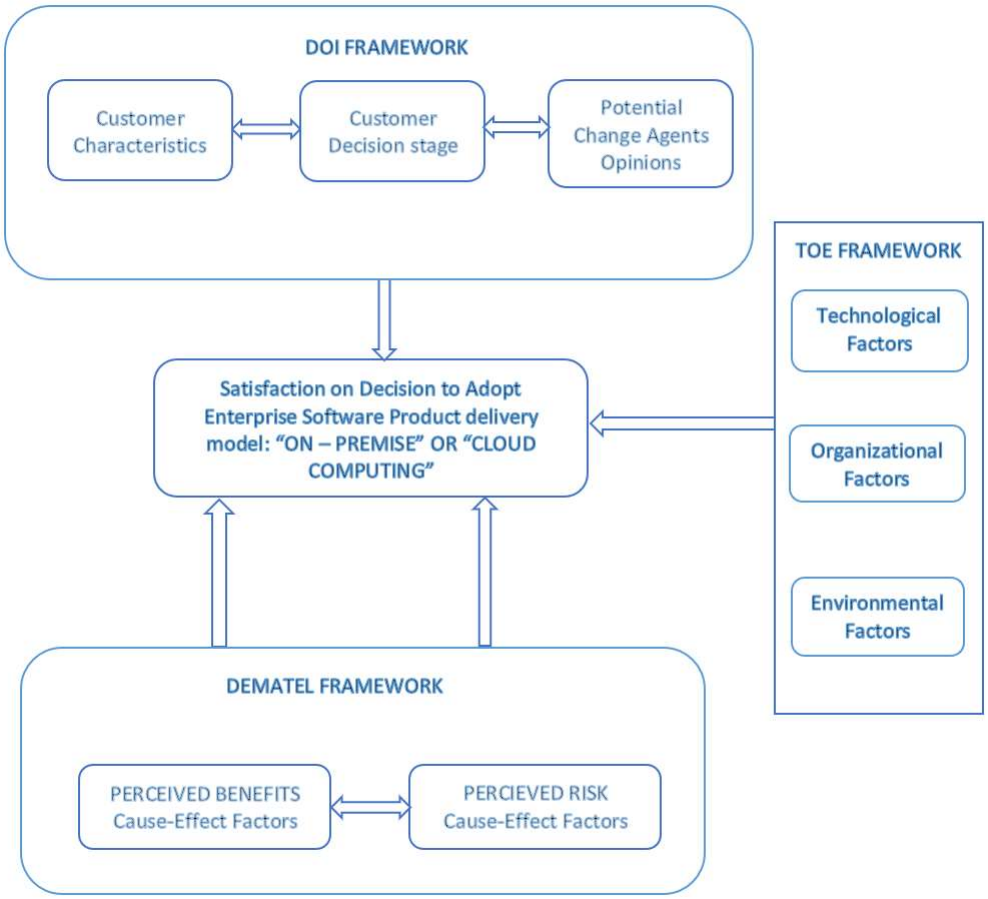
Based on the above discussion. For this research, the researcher has integrated research models like Diffusion of Innovation (DOI), Decision making trial and evaluation laboratory (DEMATEL), and Technology-organization-environment (TOE) which helps in understanding the viewpoints of stakeholders like Economic buyer, Technical buyer, and end-user with respect to scope.

Figure 2.6 - 1 represents the integrated model developed after the integration of research frameworks like Diffusion of Innovation (DOI), Decision making trial and evaluation laboratory (DEMATEL), and Technology-organization-environment (TOE). The proposed model takes into account the Technical context, Organizational context, Environment context, Perceived Benefits context, and Perceived Risks context while identifying the influencing factors on each stakeholder like an economic buyer, technical buyer, and end-user with respect to the scope listed below:

- Organizations that already have an on-premise model of software product wants to adopt a cloud computing model.

- Organizations that adopted the cloud model want to re-adopt back to the on-premise model.

Figure 2.6 - 1: Integrated Model for adoption of Enterprise software product deployment model: On-Premise or Cloud Computing



Source: Researchers own model based on models TOE, DOI, DEMATEL

Scope I: Organizations that already have an on-premise model of software product wants to adopt a cloud computing model.

The factors influencing Economic buyers in this scope are mentioned below and well defined in section **2.4** under relevant frameworks.

i. Relative Advantage (in terms of costs)
ii. Awareness level of IT team related to Cloud Computing model of software product (Do they need trainings. How much training costs)
iii. Top management support (in terms of Costs)

iv. Availability of the required organizational resources (financial resources)
v. Size of the company or its IT unit (No. of employees)
vi. External Support (vendor charges)
vii. Pay only for what you use (Cloud users will pay only for features being used in the product)
viii. Monthly payments (Payment are done on monthly basis)
ix. Requires less in-house IT staff, costs (Vendor will provide support to cloud infrastructure, Customer need not maintain IT staff, thus saves costs of maintaining staff)
x. Autoscaling of computational resources charges (CPU, RAM, etc.. will get multiplied when load increases)
xi. Data Storage charges

The factors influencing Technical buyer and end user in this scope are mentioned below and well defined in section **2.4** under relevant frameworks.

i. Relative advantage (in terms of Technology)
ii. Compatibility (with existing IT infrastructure)
iii. Complexity (Ease of Use)
iv. Trialability (experiment the product before decision)
v. Observability (observe the results during experiment)
vi. Top management support (in terms of technology and innovation)
vii. Availability of the required organizational resources (IT expertise, and/or IT infrastructure)
viii. External support (Customer Support/Online Forums)
ix. Government support (Technology Support regulations)
x. Easy and fast to deploy to end-users
xi. Encourages standard systems (Supports shifting between different cloud providers)
xii. Always offers latest functionally (All new features are supported in Cloud due to monthly releases)
xiii. Sharing systems with partners simpler (Just need to create an account)
xiv. Single Sign-on process (Ease of use, authentication to one product will authorize to different products)
xv. Data Availability (Data is available to legitimate users using High availability and redundancy)

xvi. Data Accessibility (Data is Accessible to users when needed)

xvii. Data locality (Data location is in local geography)

xviii. Data security (Data is secured when stored in cloud servers)

xix. Network and web application security (Design of network and application security in cloud)

xx. Data integrity (Guarantee that data is not tampered when stored in cloud servers)

xxi. Authentication and authorization (Authentication to legitimate users and they are authorize to access resources)

xxii. Data Privacy (Provider ensure secure separate segregation of data at physical layer)

xxiii. Application Sensitivity (Software might have IPR which cannot be exposed in Cloud)

xxiv. Virtualization vulnerability (Virtualization software of Cloud vendor is not vulnerable)

xxv. Data backup (daily/weekly/monthly back up of data. In case of failure, restore last backup)

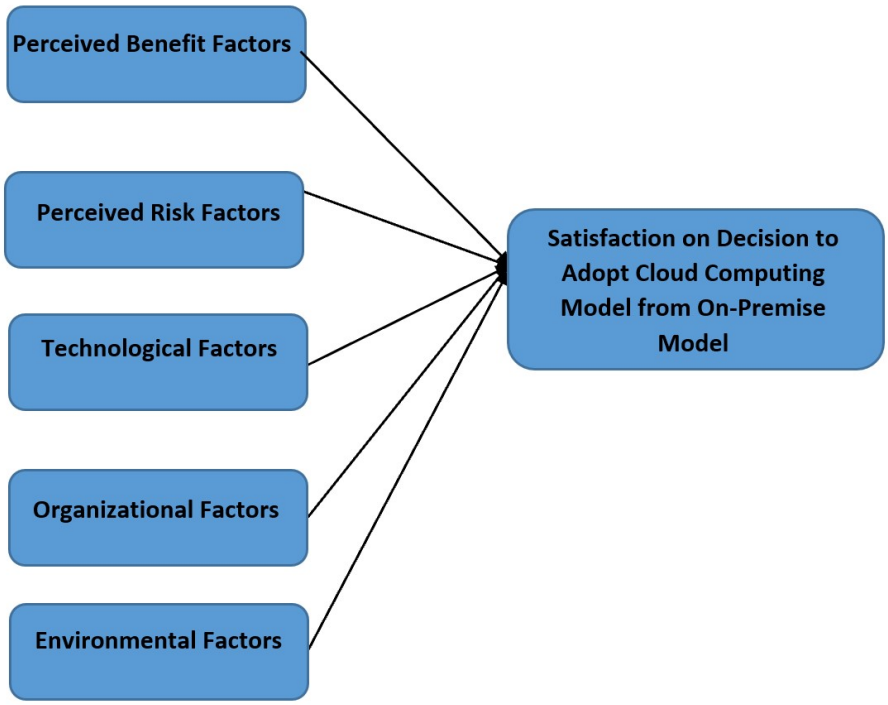
xxvi. Identity Management (How identities are secured)

Since it's a corporate decision and involves multiple teams (Burke 2022) and based on the scope in figure 2.6 - 2, the researcher now presents the Null hypothesis and Alternate hypothesis which are as follows:

Hypothesis $H1_0$: **Adoption of Cloud computing deployment model of software product by migrating from on-premise model is not influenced by technical, organizational, environmental, perceived benefit, and perceived risk context for the economic buyer.**

Hypothesis $H1_a$: **Adoption of Cloud computing deployment model of software product by migrating from on-premise model is influenced by technical, organizational, environmental, perceived benefit, and perceived risk context for the economic buyer.**

Figure 2.6 - 2: Conceptual Model for adopting Cloud computing model of Software Product from On-Premise model



Source: Researchers own model based on models TOE, DOI, DEMATEL

Hypothesis $H2_0$: **Adoption of Cloud computing deployment model of software product by migrating from the on-premise model is not influenced by technical, organizational, environmental, perceived benefit, and perceived risk context for the technical buyer and end user.**

Hypothesis $H2_a$: **Adoption of Cloud computing deployment model of software product by migrating from the on-premise model is influenced by technical, organizational, environmental, perceived benefit, and perceived risk context for the technical buyer and end user.**

Scope II: Organizations that adopted the cloud computing model want to re-adopt the on-premise model.

The factors influencing Economic buyers in this scope are mentioned below and well defined in section **2.4** under relevant frameworks.

i. Bill surprise (promotional rate pulls organizations in, but the real rate ends up being significantly higher than forecasted)
ii. Monitoring the unused hosts (Resources left idle needs to be monitored and switched-off)
iii. Early termination or leaving the cloud provider charges/Exit Charges
iv. Licensing of OS and application (License model is different in On-premise than Cloud)
v. Provider Data pull out charges (Cloud provider will charge for data pulled out due to contract termination)
vi. Top management support (in terms of costs)
vii. Size of the company or its IT unit (No. of employees)
viii. Relative advantage (in terms of Costs)

The factors influencing technical buyers and end users in this scope are mentioned below and well defined in section **2.4** under relevant frameworks and more specific definitions are presented at the end of this scope.

i. Performance of Software product in Cloud
ii. Local data retention laws (Data should be stored in local data centers)
iii. Risk mitigation strategies (Strategy in case of Hacking Attacks/Service breakdown)
iv. Monitoring the unused hosts (Idle hosts should be turned-off)
v. Awareness level of IT team related to On-Premise
vi. Availability of the required organizational resources (IT expertise, and/or IT infrastructure)
vii. Compatibility (Compatible with existing infrastructure)
viii. Complexity (Ease of use)

Factors influencing the re-adoption of the on-premise model of the software product from the cloud computing model discovered during interviews and focused group discussions

Bill surprise

This can happen due to various reasons such as

i. The initial promotional offerings attracted the organizations but after some time the billings end up being significantly greater than predicted (Burns, 2017).
ii. If the computing resources or hosts are left idle and not being used but alive then it cost unnecessarily.
iii. There might be some application bug due to which computing resources are getting auto-scaled and costing unnecessarily.
iv. Credentials of Cloud provider's service accounts got compromised and hackers increased the computing resources resulting in an increase in the cost.

Performance of Software Products in the Cloud

It is likely that Software products in the cloud are not yielding the same performance when compared to the On-premise model of the software product. Performance can be defined as the number of requests an application is processing for a given amount of time and computing resources (Burns, 2017).

Local data retention laws

Organizations that are involved in business with federal customers, defense organizations, and financial institutions might be subjected to local data retention laws. Business dependency with these organizations will force organizations to get certified for certain industry compliance standards such as FIPS for federal and defense organizations. Financial institutions are subjected to data retention and reporting requirements of the Foreign Account Tax Compliance Act (FATCA) (Rouse, 2014).

Risk mitigation strategy

Organizational risk mitigation strategy might force the organization to re-adopt the On-premise model of the software product in the following cases (Haber, 2013).

i. Failure of service at the Cloud provider's end
ii. When the vulnerability test results report security risk

iii. In case, if DDOS (Distributed Denial of Service) attacks are successful in the cloud provider's environment
iv. Scalability issues
v. Legal Risk (Maintaining compliance with HIPAA, etc.)
vi. Data Privacy

Monitoring the unused hosts

Organizations maintain two environments namely production and testing. Unused development hosts which are part of the test environment can end up being tremendously expensive if they are not monitored properly (Burns, 2017).

Early termination or leaving the cloud provider charges

There might be charges when organizations want to terminate or leave the cloud service early than what the contract states (Burns, 2017).

Licensing of OS and application

When re-adopting the on-premise model from the cloud, the organization has to check the details of licensing of OS and application to overcome licensing issues in the On-premise model of the software product (Burns, 2017).

Exit Charges or Provider's Data pull-out charges

Since the software application was running in the cloud, there might be data stored in cloud servers. An administrator must pull out data from the cloud and restore it on On-premise deployment. Most of the cloud providers charge per megabyte for data being pulled out from their servers. If the data is more then it will cost more to pull out the data from cloud servers (Burns, 2017).

2.7. Summary

In this chapter, an overview of existing research related to the adoption of cloud computing models and other similar technologies is provided. A literature survey carried out in this research has helped in determining how to study the adoption behavior for an innovation. The chronological order of the literature review is presented in this chapter, and it has helped the research study in

determining the current developments and future research required for studying adoption behavior. Based on this literature review, the researcher has developed a conceptual framework required for this research study. The researcher has presented the current models being used and the thinking of other researchers around the adoption of cloud computing. Figure 2.5-1 represents the conceptual model of the integrated framework representing the different contexts of TOE, DOI, and DEMATEL. Based on this, the relevant scopes and conceptual models are represented in Figure 2.5-2. The conceptual models will form the basis for the research questionnaire and analysis. The different conceptual models acknowledge different viewpoints of stakeholders like an economic buyer, technical buyer, and end-user according to the scope mentioned below.

- Organizations that already have the on-premise model of software product wants to adopt the cloud computing model.

- Organizations that adopted the cloud computing model want to re-adopt the on-premise model again.

Moreover, the framework and conceptual models balance the factors at both organizational and individual level according to the scope mentioned above. The factors mentioned in different scopes with respect to stakeholders will influence organizations in decision-making for buying an enterprise software product deployment model.

CHAPTER - III

RESEARCH METHODOLOGY

Chapter - III

RESEARCH METHODOLOGY

3.1. Overview

In the previous two chapters, the literature relevant to this research study as well as theories, and frameworks are presented. The discussion also included the research gaps and the research problem at hand. This chapter discusses the research methodology used in this research study "Factors Influencing Cloud Adoption By The Organizations For Enterprise Software Products". As discussed in the previous chapter, the research methodology adopted for this study is the integration of three well-known scientific models Diffusion of Innovation model (Rogers, 2003; Rogers, 1995), the Technology-organization-environment model (Tornatzky L & Fleischer M, 1990)and DEMATEL model (Gabus & Fontela, 1972, 1973).

This chapter also discusses the research problem at hand, the problem statement, and the research objective. Further in this chapter, the details about population, sample size, sampling method, etc. are discussed followed by a discussion on data collection. Finally, the chapter concludes with a discussion on the pilot study carried out to evaluate the research plan, and the conclusions from the pilot study are presented.

3.2 Research Question

Based on the findings from the literature review, the following research questions are formed.

1. How are organizations taking decisions to move from one deployment model to another deployment model of a software product?

2. Researchers are using DOI, TOE, TAM, TPB, TRA, TTF, and DEMATEL scientific models to study adoption behavior. Is there a need for an integrated approach to study the influence of various factors depending on buyer and scope?

3. Do all factors influence the adoption or re-adoption decision by organizations?

3.3 Research Objectives

Organizations need IT infrastructure for their day-to-day operations. With the recent advancements in the field of distributed computing, organizations have a choice to adopt either an on-premise model of the software product or a cloud computing model of software product. Even customers with existing IT infrastructure are moving from an on-premise model to cloud computing. Cloud computing is the new revolution in information technology, but it is not a good choice for all organizations. The objective of this research study is listed below and will help organizations in decision-making for the adoption of the cloud model or re-adoption of on-premise.

Objective 1: To identify the factors influencing the adoption of the cloud computing deployment model of enterprise software products from the on-premise model.

Objective 2: To assess the influence of adoption factors on the decision to move from an on-premise model of the software product to a cloud computing model of the software product.

Objective 3: To identify and assess the reasons behind moving from the cloud computing model of the software product to the On-premise model of the software product again.

3.4 Research Design

Overview of Methods and Approaches

Greene (2015), has explained that mixed methods can be integrated at different levels of research methods, research methodologies, and research paradigms. With the help of this, the researcher can say that research designs of equal status are possible with both qualitative and quantitative analysis. Equal-status mixed methods are also known as "Interactive mixed methods research". Similarly, Teddlie & Tashakkori, (2009), has advocated multilevel mixed methods and fully integrated mixed methods. The multi-level mixed method is a complex method because it involves integration at different levels of respondents. In this research, the data is collected from multiple stakeholders like economic buyer, technical buyer and end user. It also involves collection of data at different levels in the hierarchy of organizations. Therefore, the data is collected from the organizational level as well as the end-user level. Schoonenboom (2016), has published the

possible ways of integrating the data collected from different respondents functioning at different levels of an organization. Johnson & Christensen (2019), has named the mixed method approach an "explanatory concurrent design" because the research done in this approach is qualitatively driven, explanatory, and concurrent.

The mixed methods research technique was invented in social sciences and expanded to various other disciplines. Its methods and procedures have been refined to match the needs of various research questions, (Creswell & Clark, 2010). These methods and procedures include but are not limited to alternative mixed methods design, procedures containing advancing rigor, and specifying a representation system for detailing the designs which increase communication across fields, (Creswell & Clark, 2007). It also provides a way to visualize the procedures through diagrams. Mixed methods provide a way to note down research questions that arise after integration. A well-defined mixed-method study will include the following characteristics, (Creswell et al., 2004).

1. Data collection and analysis for both open-ended qualitative data and close-ended quantitative data.
2. Providing rigorous procedures in data collection and analysis appropriate to each method. For example, ensuring sample size for both qualitative and quantitative data.
3. Integration of data during collection and analysis.
4. Providing procedures that facilitated the implementation of quantitative and qualitative components sequentially or concurrently. This can be with the same size of the sample or with a different size of the sample.
5. Developing the procedures within the conceptual models of research. This is to examine and understand the research problem from multiple perspectives.

This research study also uses the mixed-method approach explained above. The research problem identified is “Identifying and assessing various factors influencing cloud adoption by the organizations for enterprise software products from the on-premise model” and the overall purpose of this research study forms the basis of the selection of a mixed method approach. Mixed methods help in the generation of rich data in the initial stages of research which helps in understanding the

unexplored areas of the research problem. The primary data is collected using qualitative and quantitative techniques while secondary data is collected using a review of the literature (Refer to Chapter 2). With the help of Interviews, we discovered the various scopes of adoption of software product deployment. We also identified the critical factors from integrated research model with the help of focused group discussions and interviews. Field notes were used to refine the questionnaire. Finally, a questionnaire needed for quantitative analysis is developed using the field notes and outcome of interviews. This is in line with the research done by (Van de Weerd et al., 2016).

Type of Research

The type of research study is descriptive, explanatory, and as well as exploratory in nature. Descriptive research is used where there is a need to describe the characteristics of a population. Kothari (2004), says that "Descriptive research studies are those studies which are concerned with describing the characteristics of a particular individual, or of a group". Descriptive research is chosen for this study because the researcher was interested in finding the opinions of the respondents and identifying the critical factors for adoption of software product model using data collection tools like interviews, FGDs and surveys. Descriptive research also helped the researcher to generalize the findings to a larger population. The major focus of this study is to study the influence of various factors derived from the integrated research model on an organization's decision to adopt to on-premise or cloud computing model of the software product. Definition by Zikmund et al., (2012), states causal or explanatory research is "identifying cause and effect relationship." This research study is casual research done to find out the cause-and-effect relationship between various factors derived from the integrated research model and an organization's decision to adopt to on-premise or cloud computing model of the software product.

On the other hand, the process of investigating a problem that has not been studied thoroughly is known as exploratory research. The main goal of exploratory research is to have a better understanding of the problem being researched. In the research study, an exploratory type of research is used when the researcher is trying to gain familiarity with an existing trend in innovations, (Zikmund et al., 2012). This has helped the researcher to gain more insights into the new phenomenon. The exploratory type of research starts with a general idea and the outcome of

the research are used to find the issues with the phenomenon. The process will vary according to the new findings or new data or insights into the phenomenon. In this research study, Field notes are used during qualitative research to refine the findings in individual case analyses. With this approach, several influencing factors are found for the adoption of the enterprise software product deployment model. Field notes have helped in gaining more insights into the complexities involved in decision-making for the adoption of a software product deployment model.

3.5. Qualitative Research

3.5.1 Interviews and Focused Group Discussion construction

The process of collecting data through a questionnaire is known as "Surveying", (O'Leary, 2014). In research, the primary data is collected through an instrument known as a "Questionnaire", (Cohen et al., 2013). O'Leary, (2014), says "The primary data exist because it is the need of the research study and is collected using techniques like interviews or questionnaires". Creswell (2009), says, the face-to-face conversation between a researcher and a participant for the transfer of information needed for the interviewer is an "Interview". In Qualitative research, interviews are done when the researcher asks participants general and open-ended questions and records their answers on audio tapes, (Creswell, 2009). The researcher then transcribes the data into a file on the computer. This file will be used for analysis and results are discussed. In interviews, open-ended questions are asked to obtain impartial answers while closed-ended ones are asked to force the respondent to answer in a particular way, (Creswell, 2009); (McNamara, 1999). Focus Group discussion is similar to an interview where the researcher will facilitate and ask questions to a group of people and record their responses, (Bell & Waters, 2014). This group will have four to six participants. Open-ended questions will be asked and responses from different people are recorded.

In this research study, the researcher has used a combination of structured and unstructured formats to generate a rich set of valuable data. The structured sheet is available in Appendix I of this document. (ADJP Quad, 2016; Creswell, 2009; McNamara, 1999) has listed out the steps for conducting the interviews, focused group discussions, and collecting responses. The steps are as follows:

i. Identify the interviewees.
ii. Determine the type of interview you will use.
iii. During the interview, audiotape the questions and responses.
iv. Take brief notes during the interview.
v. Locate a quiet, suitable place for the interview.
vi. Obtain consent from the interviewer to participate in the study.
vii. Have a plan, but be flexible.
viii. Use probes to obtain additional information.
ix. Be courteous and professional when the interview is over.

Similarly, Robert (2014), has discussed the framework for collecting the data using interviews and group discussions. In line with his work, the researcher has used a similar technique of interviews and focused group discussion on collecting primary data. Paré, (2004), has discussed obtaining information from interviewees and participants of focused group discussions. In line with his work, the researcher used the same technique to obtain the required information from the participants. This has also given us a direction in understanding the influence of factors and decisions made by organizations in adopting appropriate deployment models of the software product. The researcher prepared an interview guide which is used for all interviews and the researcher kept on refining this guide after getting inputs from each interview. All participants were informed about the critical factors influencing the decision to adopt the cloud deployment model of the enterprise software product.

The interview started with a formal introduction of the participants and the research problem. The interviewer then explained the factors with examples to the participants and asked for their experiences and responses is recorded. The interviews were done and recorded over online collaboration tools like Cisco Webex, and Zoom, and the video conferencing is recorded. The interviewer assured the participants that the information will be kept confidential, and organizations are represented as O1, O2, O3 and so on.

3.6. Quantitative Research

In Quantitative research, Questionnaires are used to discover what the masses are thinking. These include but are not limited to market research, customer service feedback, social science research, and opinion polls, (O'Leary, 2014). The questionnaires are distributed using emails, survey monkey. The questionnaire has to be administered personally because it enables the researcher to explain the purpose of the study to the respondent and increases the chances of receiving the response in return, (Bell & Waters, 2014).

For this research study, the researcher used qualitative data collection tools like interviews, and focused group discussions and recorded them on online collaboration tools like cisco Webex and zoom. Researchers have also used survey questionnaires for quantitative data collection and collected the responses through emails, survey monkey, and google forms.

3.6.1 Survey Questionnaire Construction

The survey questionnaire instrument consisted of 4 sections (Appendix II of this document contains a full copy of the survey questionnaire). The first section comprises Organizational variables including Organization Age, Organizational Size, Industry type, and Total Assets. It also includes demographic data relating to individuals like age, qualification, and designation. This section also included general questions which guide the respondent to answer the questions available in the other three sections depending on their scope and decision-making stage. It also asks the respondent to list the existing on-premise and cloud computing software products available in their organizations and their status of adoption.

For the second section, the respondent answered the section if the respondent's scope is a new requirement or already adopted deployment model of a software product multiple choice statements (Ordinal scale: 1 to 5) for the respondents. The items that measure the importance of the independent variable from least important to most important. It also contains the outcome variable which measures the satisfaction level of the respondent in adopting the appropriate deployment model of the software product.

For the third section, the respondent answered this section if the respondent's scope is cloud adoption from an on-premise deployment model. The items that measure the importance of the

independent variable from least important to most important. It also contains the outcome variable which measures the satisfaction level of the respondent in adopting the appropriate deployment model of the software product. The scale measures the satisfaction level from Dis-satisfied to Satisfied and this will lead to the adoption of an appropriate model of the enterprise software product.

Table 3.6 – 1: Factors derived from Literature review and used in Questionnaire

Sl No.	Construct	Factor	Source
1	Technological	Relative advantage	Rogers, (2003); Tornatzky & Fleischer, (1990)
2		Compatibility	Rogers, (2003); Tornatzky & Fleischer, (1990)
3		Complexity	Rogers, (2003); Tornatzky & Fleischer, (1990)
4		Trialability	Rogers, (2003); Tornatzky & Fleischer, (1990)
5		Observability	Rogers, (2003); Tornatzky & Fleischer, (1990)
6	Organizational	Top management support	Sabherwal et al., (2006); Scupola, (2009)
7		Size of the company or its IT unit	Kushnir et al., (2010); Wach, (2015)
8		Awareness level of IT team	Weerd et al., (2016)
9		Availability of the required organizational resources	Iacovou et al., (1995); Wang & Ahmed, (2009)
10	Environmental	External Support	Li, (2008)
11		Government support	Dahnil et al., (2014)
12	Perceived Benefit	Pay only for what you use	Rouse, (2015)
13		Monthly payments	Rouse, (2015)
14		Requires less in-house IT staff	Castillo, (2020)
15		Easy and fast to deploy to end-users	Ram et al., (2011)
16		Encourages standard systems	Ram et al., (2011)
17		Always offers latest functionally	Ram et al., (2011)
18		Sharing systems with partners simpler	Burgard, (2020)
19		Single Sign-on process	Jansen & Grance, (2011)
20		Data Availability	Subashini & Kavitha, (2011)
21		Data Accessibility	Subashini & Kavitha, (2011)

22	Perceived Risks	Data locality	Chen & Zhao, (2012)
23		Data security	Subashini & Kavitha, (2011)
24		Network and web application security	Subashini & Kavitha, (2011)
25		Data integrity	Linthicum, (2009); Kandukuri et al., (2009)
26		Authentication and authorization	Subashini & Kavitha, (2011)
27		Data Privacy	Subashini & Kavitha, (2011)
28		Application Sensitivity	Eric, (1995)
29		Virtualization vulnerability	Catteddu, (2010)
30		Data backup	Chen & Zhao, (2012)
31		Identity Management	Subashini & Kavitha, (2011)
32		Data Storage charges	Millman, (2020)
33		Auto-Scaling of computational resources	Hung et al., (2012)

3.7. Population

The population can be termed as the entire collection of entities a researcher is trying to understand. The basic component of any research study is a clear definition of population because the scope of the conclusions resulting from research is dictated by the way the population is defined. Polit & Hungler (1999), refer to the population as an aggregate or totality of all the objects, subjects, or members that conform to a set of specifications. If the population is small, then the factors or traits of interest can be measured for every member of the population. If the population is not finite, then the measurement of factors or traits of interest is not possible due to financial or logistics limitations. In this research study, the population refers to the organizations from any type of industry which uses the Information and communications technology (ICT) infrastructure. Foldoc, 2008; Murray (2011), defines ICT as an extensional term for information technology (IT) that stresses the role of unified communications and the integration of telecommunications (telephone lines and wireless signals) and computers, as well as necessary enterprise software, middleware, storage and audiovisual, that enable users to access, store, transmit, and manipulate information. There are certain specific characteristics that people in the population must possess in order to be included in the study, (Polit & Hungler, 1999). The eligibility criteria for the participants/respondents in this research study are as follows:

i. *Economic Buyer:* The people in this buyer category are CEOs, CIOs, VPs, AVPs, IT Directors, and IT Managers, (Beveridge, 2017).

ii. *Technical Buyer:* The people in this buyer category are IT Directors, IT Managers, IT Staff, (Beveridge, 2017).

iii. *End user*: The actual consumer of the software product, (Beveridge, 2017).

3.8. Sample

Polit & Hungler (1999) has defined a sample as "A subset of the population which is selected for participation in the research project. It is a fraction of the whole selected to participate in the research study".

3.8.1. Sample Size

Krejcie & Morgan (1970) has emphasized that research can increase the sample size depending on the low response rate from the survey respondents. For this research study, the sample size selected is 384 because the target population is any organization with Information and communications technology (ICT) infrastructure, which is not a finite number (Krejcie & Morgan, 1970). Also, Kothari, (2004) defines the sample size with the following formula.

n = z2. p. q. N / e2. (N – 1) + z2. p. q

Where

n = sample size

z = standard variation at a given level of confidence. The value of z for 95% of confidence level is 1.96

N = size of the population

e = precision or acceptable margin of error. For this research study, The value of _e'is taken as .05.

p = sample proportion and q = 1 – p

The most conservative sample size can be obtained by maximizing _n', and the sample will result in the desired precision. This is achieved if the value of q= 0.5 Sample size is taken, considering p = 0.5 and the other values given above, is thus determined as follows:

Therefore, Determined Sample Size (95% confidence level) is 384

3.8.2. Sampling Method

The sampling method provides details of the procedure adopted in the research study to collect data regarding the respondents. This study has adopted the Purposive Sampling method for quantitative data collection. Purposive sampling was used primarily to ensure that the sample is more closely aligned with the objectives of the study and to enhance the study's trustworthiness of the data and findings (Campbell et al., 2020). In this research work, the eligibility for an organization is that they might have adopted the cloud model by moving from the on-premises model. Hence the researcher used a purposive sampling method. For collecting the qualitative research, the Snowball sampling method was adopted. Goodman (1961) defines "Snowball sampling or chain sampling, chain-referral sampling, and referral sampling as a nonprobability sampling technique where existing study subjects recruit future subjects from among their acquaintances. Thus, the sample group is said to grow like a rolling snowball. Marshall (1996); Small (2009) say nonprobability approaches are more suitable for in-depth qualitative research in which the focus is often to understand complex social phenomena. In this research study, there are lots of complexities involved in adopting the cloud deployment model for enterprise software products. With different stakeholders and with respect to different scopes, it becomes a very complex decision. Hence the researcher has used the non-probability sampling method for this study.

3.8.3 Sampling Frame

INDIA is a growing economy and has a large presence of different types of industries with ICT tools and infrastructure enabled. The respondents in our research study are multinational organizations operating in INDIAN cities like Bengaluru, Chennai, Hyderabad, and Pune. The majority of organizations are using both on-premise and cloud service models like Software-As-A-Service and Infrastructure-As-A-Service. Data was collected from different types of organizations like E-commerce, Pharmaceuticals, Financial Institutions and Banks, IT industry. The respondents are from different levels in the organization such as Co-Founders/CEO/CIO, IT Managers, IT Procurement Managers, IT Staff, and IT Admins. The details like what percentage of the type of industry, organization profiles, respondent profiles, and demographic variables are presented in section 4.3.1 for both economic buyers, technical buyers, and end users.

3.9. Data Analysis Framework

Data analysis is carried out on the sample of 384 to meet the objectives of this research study. Chapter 4 contains more details on data analysis. The basic strategy followed for data analysis is presented below.

Table 3.9 - 1: Data Analysis Framework

Statistical tools used	Purpose	Variables/Factors for which test was conducted	Software
Coding of Variables	Identifying Variables	All the variables	Microsoft Excel
Cleaning of Variables	Removing gaps and outliers	All the variables	Microsoft Excel
Simple Percentage Analysis	To represent sample composition	Organizational Variables	SPSS – Version 23
Exploratory Factor Analysis	To reduce the no. of items into factors	Constructs of Model – Economic and Technical Buyers adopting Cloud from On-prem	
Descriptive Analysis	To identify overall mean and std. deviation		
Correlation			
Regression			
ANOVA Analysis	Determining the Influence of variables		
Structural Equation Model	To check reliability and validity and testing the path of overall model		Smart PLS 3.0
Qualitative data analysis	To identify and assess the reasons behind re-adoption on-premise model from cloud computing model.	Structured Interview was conducted	NVIVO 10.0

3.10. Pilot Study

The pilot study is carried out to test the validity of the integrated research model at the initial stage of the research study, this has helped in determining the influence of each factor derived from the integrated research model on an organization's decision to adopt cloud computing model of the software product from the on-premise model of the software product. The result of the pilot study has also helped in refining the instruments of the research study.

3.10.1 PRE-TEST

For the pilot study, the most commonly used sampling technique is snowball sampling because it will be at the hand and existing network of the researcher. Saunders et al., (2012) say "A snowball sample is a type of non-probability sampling method where the sample is taken from a group of people easy to contact or to reach".

The survey questionnaire was distributed to the concerned stakeholders of different types of industries in India. Based on the feedback of the expert panel, the questionnaire was refined and contained relevant factors with a brief description. The respondent was requested to provide feedback for any details related to factors. The respondents did not report any concern in understanding the factors and answering the survey questionnaire. The researcher also included some open-ended questions so that the experts can respond with their suggestions related to understanding factors. The feedback from the experts in organizations was invaluable and helped in finalizing the survey questionnaire in terms of language and scope. Organizations adopt innovations for various benefits and need reasons.

3.10.2. Data Collection

Primary Data: The researcher has used both online tools like the "Email Questionnaire" and Google Forms as a way to administer the survey questionnaire. Evans & Mathur (2005) says "The use of online surveys is a contentious issue even though the technology exists to administer the research survey". Evans & Mathur, (2005) has provided a comprehensive list of advantages and challenges of online survey methods. These advantages and challenges have been assessed in the context of this research. The list of advantages is as follows:

i. Low administration costs
ii. Controlled sampling
iii. Convenience of administration of surveys
iv. Speed and timeliness of administration of surveys
v. Ease of data entry and analysis
vi. Ease of follow up

In addition to the above-listed advantages, technological innovations guarantee that the survey can have diverse features included in it to ensure easier completion for the respondent. It also decreases the likelihood of invalid responses. For example, in this research study, the survey tool guaranteed that mandatory questions are not left unanswered.

Similarly, the list of potential challenges for online surveys are as follows:

i. Lack of online experience of respondents
ii. Use of various online technologies used by respondents
iii. Challenges related to sampling from skewed attributes of internet users
iv. Samples representativeness

Almost all the challenges listed above apply to the broader use of online surveying and therefore, they are not considered to be significant for this survey questionnaire. An email questionnaire is sent to the participant in an excel sheet and response is collected.

Secondary Data: The secondary data was collected from well-known analysts Gartner and other on-line sources listed below

1. Cloud Adoption Statistics for 2021, (Galov, 2021).
2. Worldwide Public cloud services market grew 31.3% in 2018, (Costello Gartner & Laurence Gartner, 2019).
3. SMB Cloud Insights - Odin (Bacso, 2015).
4. BCSG, The Small Business Revolution: Trends in SMB Cloud Adoption, (ahmed, 2015).
5. SMEs in Asia Pacific: The Market for Cloud Computing, Asia Cloud Computing Association, 2015 (*SMEs in Asia Pacific: The Market for Cloud Computing*, 2015).
6. Cloud Readiness Index 2014, (Asia Cloud Computing Association, 2014).

The data collection is done from Dec 2017 to April 2018. In total, the survey questionnaire was distributed to 100 respondents. The responses recorded were 68, which is 68% response rate.

3.10.3 Results, Discussions & Conclusions

The data from Google Forms and the Email questionnaire is saved into an excel sheet. Creswell, (2003) says that the first step to perform is to clean the data and check if any data is missing. All the questions in the survey are mandatory, therefore there was no missing data. The data collected from the surveying with the help of Google Forms and email questionnaire were analyzed statistically. This was done to identify the influence of various factors on the decision-making of organizations for adopting the cloud deployment model of the enterprise software product. From the data collected a table is prepared for the different types of software being used by different types of industries to accomplish the day-to-day needs and tasks of the organization. Table 3.10.3 - 1 lists the different types of on-premise and cloud computing (SaaS, IaaS) software used by different types and specific types of industries.

Table 3.10.3 – 1: Overview of Enterprise Software Products

Sl No.	Industry Type	Purpose	On-Premise Software	License	Software-As-A-Service cloud model	License (User/Month)	Infrastructure-As-A-Service cloud model
1	All Types	Email System	Microsoft Exchange	$4,399	Microsoft Office365	E5 - $38	Microsoft Azure
2	All Types	Email System	IBM Lotus Notes Traveler	$5600	Google G-Suite	$18	Amazon Web Services
3	All Types	Authentication Server	Microsoft Windows Server – Data Centre	$6155	Microsoft Azure AD	$9	Rack Space
4	All Types	Device Management	MobileIron Core	$10 per device	MobileIron Cloud	$8.4	Microsoft Windows Server
5	All Types	Device Management	VMWare - AirWatch	$38,875	VMWare – Workspace One	$9.33	Microsoft Exchange
6	All Types	On-line Collaboration	Cisco Webex, Zoom, Skype	$ 1,729,200	Cisco Webex, Zoom, Skype, MS Teams	$13.5	IBM Lotus Notes Traveler
7	All Types	HRIS	SAP Travel mgmt, ADP	250,000	Concur, Green House	$8.5	

8	All Types	Policy & Device Management	Cisco ISE, Aruba NAC	$107533.92	Cisco ISE, Aruba Central	$22
9	All Types	Firewall/VPN	Cisco, Juniper, Palo-Alto, Pulse Secure	$71,250	Cisco, Z-Scalar, Palo-Alto	$18

For example, The softwares Microsoft Exchange, IBM Lotus Notes Traveler, Microsoft Windows Server, MobileIron Core, Cisco Webex, VMWare - AirWatch, Microsoft Office365, Google G-Suite, Salesforce CRM, Zoom, Cisco Webex, Green House, ServiceNow, MobileIron Cloud, Concur, Microsoft Azure, Amazon Web Services, Rack Space, Microsoft Windows Server are used by all types of industries and are available in both on-premise, cloud computing (SaaS, IaaS) model.

The statistical tool SPSS software is used to analyze the data collected for the pilot study. This was done to verify the reliability of data and the influence of factors on the organization's decision to adopt the appropriate model of the enterprise software product. Reliability analysis was done to find the validity of the questionnaire and whether the value of Cronbach's alpha is in the permissible range or not. It was found that the value of Cronbach alpha for scope II is 0.911 which is considered excellent. The corrections are discussed in the follow-up conclusions section.

3.10.4. Conclusions from Pilot Study

The results of the pilot study reveal how organizations are influenced by factors resulting from the integrated research model. In fact, the sample also reveals that the majority of organizations are actually moving from an on-premise model to a cloud computing model. This is because of the reason that the organizations have already embraced an on-premise model of the software product. One of the main reasons is the age of the organization. Since all organizations are more than 5 years old and already have pre-defined processes and software needed to accomplish day-to-day tasks. Thus, the scope of this research study is now limited to the following.

Scope I: Organizations that already have an on-premise model of software products adopting the cloud computing model.

Scope II: Organizations that adopted the cloud computing model are moving back to the on-premise model.

Furthermore, for Scope II, Researcher has presented qualitative data analysis for organizations that are re-adopting the on-premise model from the cloud computing model because a very small population of organizations are actually moving back to the on-premise model from the cloud computing model of software product

3.11. Ethical Considerations

The main objective of this research is to enhance the available knowledge relating to the complexities involved in decision-making for adopting an enterprise software deployment model. This study has followed many ethical considerations, which are implicit parts of this research study and also a basic expectation from any researcher. The participants were not influenced during the responses, they expressed their views with all freedom and the people who resisted participating in the study were not forced. The researchers responded with all explanations to the queries raised by the respondents during interviews, focused group discussions, or survey questionnaires. The researcher ensured the participants that the data would be treated with confidentiality and would be used only for academic purposes. The results of the research study are completely based on the data collected and there no fabrication or modification of data is done in the survey. This research study has given credentials to the researchers for their contribution in the form of references and citations wherever applicable.

3.12. Summary

In this chapter, the researcher presented the details of the research design, methodology, data collection, and analysis. The researcher also provided details on the population, sampling technique, and sample sizes determined for this research study. An overview of the mixed methods approach is presented along with the details of survey questionnaire development and interviews, focused group discussions details. The researcher has also presented the details of the pilot study and how the participants have been selected and the tools used for data collection. The results of the pilot study have also revealed the scope of this research study which is mentioned in the results, discussion, and conclusion section of the pilot study. The researcher has also presented different

types of software products being used by organizations. In the next chapter, the researcher will present the findings and results of this research study.

CHAPTER - IV

DATA ANALYSIS AND INTERPRETATION

Chapter - IV

DATA ANALYSIS AND INTERPRETATION

4.1 Overview

In the previous chapter, the researcher presented the need to use mixed methodology for this research study. It also discussed the details of qualitative and quantitative tools used in this study. The previous chapter concluded with the details of the pilot study and its results. In this chapter, the researcher presents the details of Quantitative data analysis and Qualitative data analysis.

4.2 Quantitative Data Analysis

For Quantitative data analysis, the scope of this research study with respect to stakeholders like the economic buyer, technical buyer, and end-user is limited to Organizations that already have the on-premise model of software products adopting the cloud computing model. The quantitative data is collected using a survey questionnaire like survey monkey and emailing services. In total, 404 organizations participated in the research study.

4.2.1 Economic Buyer's Data Analysis and Interpretation

Table 4.2-1 represents the organizational profile of the respondents from various types of industries with various sizes of organizations. The people designated for controlling the cost or commercials of IT infrastructure in an organization are Co-Founders/CEO/CIO, IT Managers, and IT Procurement Managers.

Table 4.2.1-1: Organizational Profile of Economic buyers (Respondents)

		Count	Column N %
Organizational Size	1-49 employees	96	23.8%
	50-249 employees	32	7.9%
	>250 employees	276	68.3%
Organizational Age	5-10 Years	105	26.0%
	10-15 Years	131	32.4%
	15-20 Years	69	17.1%
	>20 Years	99	24.5%
Type of Industry	IT	148	36.6%

	E-commerce	81	20.0%
	Pharmaceutical	118	29.2%
	Financial Institutions and Banks	57	14.1%
	Graduate	260	64.4%
	Postgraduate	144	35.6%
	Doctorate	0	0.0%
	Professionals	0	0.0%
Age of Respondents	20-30 Years	56	13.9%
	31-40 Years	239	59.2%
	41-50 Years	109	27.0%
Designation	IT Manager	111	27.5%
	IT Staff/Admin	1	0.2%
	IT Procurement Manager	285	70.5%
	IT Director	7	1.7%

Now researcher presents the analysis and interpretation of data collected based on the objectives of the research study. This includes analysis of the demographic profile of the respondents, Exploratory Factor Analysis, Correlational analysis, and Structural equation modeling has been done to identify the relationship between the sub-constructs of Technological factors, organizational factors, environmental factors, perceived benefits factors, and perceived risks factors.

Exploratory Factor Analysis – Adopting cloud deployment model by moving from on-premises model.

It is necessary to test whether the dataset is suitable for EFA or not. To achieve this, the results of the Kaiser-Meyer-Olkin Measure (KMO) and Bartlett's Sphericity Tests should be firstly checked. Bartlett's Test of Sphericity and the Kaiser- Meyer-Olkin Sampling Adequacy Test (KMO) are widely used in literature to determine the strength of relationships and evaluate the factorability of variables. While KMO provides information on sample adequacy, Bartlett's Test of Sphericity also provides information on whether the dataset has pattern relationships. KMO and Bartlett's tests are conducted on data for determining sample adequacy. If the KMO test value is above 0.50, then it means that the sample is adequate otherwise if the value is less than 0.50 then it means that it is

not adequate, (Kaiser & Rice, 1974). Similarly, Bartlett's test value of less than 0.05 means that the sample is adequate otherwise if the value is greater than 0.05 then it means that it is not adequate, (Dziuban & Shirkey, 1974). The results from both tests were administered to find the adequacy of the sample for collecting the opinion of organizations who already adopted both on-premise and cloud computing models of software products from an economic buyer viewpoint perspective.

Table 4.2.1-2: KMO and Bartlett's Test

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.804
Bartlett's Test of Sphericity	Approx. Chi-Square	3485.156
	df	55
	Sig.	.000

An exploratory factor analysis test is conducted to group all the variables under a common construct. Principal component analysis using varimax rotation is used to determine the factorability between 11 variables for the Organizations which already have an on-premise model of software products adopting the cloud computing model from an economic buyer's viewpoint. The main purpose of the rotation is to obtain an optimally simple structure that tries to load each variable on as few factors as possible, but while doing this, maximizes the number of high loads on each variable. The simple structure means that each factor has highly loaded variables and the rest are low-loaded. Obtaining an optimal simple structure indirectly facilitates interpretation and allows each factor to define a separate set of interrelated variables (Tabachnick & Fidel, 2001).

The variables which were loading above 0.5 are considered for further analysis. Kaiser-Meyer-Olkin measure and Bartlett's test of sphericity are used to find the sample adequacy. The results from the test show that the KMO test score (KMO=0.804) is more than the recommended value. The result from Bartlett's test of sphericity ($\chi 2 = 3485.156$, $p < 0.001$) not only signifies but also confirms that the sample is adequate for gathering the economic buyer's viewpoint. The variables having Eigenvalue greater than one are extracted resulting in three sets of factors. The total variance value is 85.449 which signifies that the factors are accountable for the organizations

which already have an on-premise model of software products adopting the cloud computing model.

Table 4.2.1–3: Rotated Component Matrix

Rotated Component Matrix[a]

	Commun-alities	Component			
		1	2	3	4
Awareness level of IT team related to Cloud Computing model of software product (Do they need trainings. How much training costs)	.832	**.874**	.256	-.016	-.040
Size of the company or its IT unit (No. of employees)	.739	**.816**	.259	.079	.012
Top management support (in terms of Costs)	.770	**.769**	.203	.217	.301
Availability of the required organizational resources (financial)	.739	**.728**	.309	.190	.277
Pay only for what you use (Cloud users will pay only for features being used in the product)	.919	.281	**.891**	.153	.154
Requires less in-house IT staff, costs (Vendor will provide support to cloud infrastructure, Customer need not maintain IT staff, thus saves costs of maintaining staff)	.901	.293	**.876**	.141	.165
Monthly payments (Payment are done on monthly basis)	.881	.338	**.849**	.133	.169
Data Storage charges	.943	.126	.138	**.950**	.080
Autoscaling of computational resources charges (CPU, RAM, etc.. will get multiplied when load increases)	.939	.110	.155	**.948**	.065
Relative Advantage (in terms of costs)	.885	-.069	.305	.143	**.875**
External Support (vendor charges)	.852	.351	.068	.008	**.851**
Total Variance Explained (85.449%)		**27.15%**	**24.47%**	**17.93%**	**15.91%**

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

The above table displays the Rotated component matrix, which helps in determining the loading of items along with relevant factors. The factors whose value is less than 0.5 while loading is deleted because these factors do not meet the KMO threshold value of 0.5. The communality value

also for individual factors is greater than 0.5, which means that all factors should be included for further analysis.

Four out of Eleven items, namely “Awareness level of IT team related to Cloud Computing model of software product”, “Top management support”, “Size of the company or its IT unit”, and “Availability of the required organizational resources” were loaded as “Factor1”. “Factor1” is the key element for finding the influence of factors for an organization’s decision to adopt the cloud computing model from an on-premise model of a software product during the investigation. In fact, Factor 1 also helped in explaining the variance of 27.15 percent of variance for the organization’s decision to adopt the cloud computing model from an on-premise model of the software product. The second set of factors, termed "Factor 2," is loaded with items namely “Pay only for what you use”, “Requires less in-house IT staff and costs”, and “Monthly payments” in the original scale. “Factor 2” has helped in explaining the 24.47 percent of variance for the organization’s decision to adopt the cloud computing model from the On-Premise model of the software product. The third set of factors, termed "Factor 3," is loaded with items, namely “Autoscaling of computational resources charges” and “Data Storage charges” in the original scale. “Factor 3” has helped in explaining the 17.93 percent of variance for the organization’s decision to adopt the cloud computing model from the On-Premise model of the software product. The fourth set of factors, termed "Factor 4," is loaded with items, namely “Relative Advantage” and “External Support” in the original scale. “Factor 4” has helped in explaining the 15.91 percent of variance for the organization’s decision to adopt the cloud computing model by moving from the on-premise model of the software product.

Descriptive Statistics – Organizational Factors

Mean and Standard Deviation are calculated as part of Descriptive statistics. These values signify the influence of each sub-construct on the overall construct. Now researcher finds the mean and standard deviation of all sub-constructs under organizational factors. The values of each item or sub-construct under organizational factors will tell us the influence of each sub-construct on overall Organizational factors.

Table 4.2.1-4 displays the mean score of each factor and their contribution toward the major construct of Organizational factors. From the table, it can be observed that “Top Management

Support" (*M*=4.62, *S.D* = 0.561) is having highest score contributing towards the major construct "Organizational Factors" (*M*=4.21 and *S.D* = 0.615).

Table 4.2.1- 4: Organizational Factor

	Mean	**Std. Deviation**
Awareness level of IT team related to Cloud Computing model of software product (Do they need trainings. How much training costs)	3.74	0.598
Top management support (in terms of Costs)	4.62	0.561
Availability of the required organizational resources (financial)	4.43	0.849
Size of the company or its IT unit (No. of employees)	4.04	0.852
Organizational Factors	**4.21**	**0.615**

The next highest score is from the item "Availability of the required organizational resources" (*M*=4.43, *S.D* = 0.852), followed by the item "Size of the company or its IT unit" (*M*=4.04, *S.D* = 0.852). The lowest score is observed from the item "Awareness level of IT team related to Cloud Computing model of software product" (*M*=3.74, *S.D* = 0.594).

Descriptive Statistics - Perceived Benefits

Table 4.2.1 – 5 displays the mean score of each common factor and their contribution towards the significant construct Perceived Benefit and Technological factors. From the table, it can be observed that "Pay only for what you use" (*M*=4.21, *S.D* = 1.040) is having highest score contributing towards the major construct "Perceived Benefit factors" (*M*=3.99 and *S.D* = 1.167).

Table 4.2.1 – 5: Perceived Benefits Factor

	Mean	**S.D**
Pay only for what you use (Cloud users will pay only for features being used in the product)	4.21	1.040
Monthly payments (Payment are done on monthly basis)	3.77	1.285
Requires less in-house IT staff, costs (Vendor will provide support to cloud infrastructure, Customer need not maintain IT staff, thus saves costs of maintaining staff)	3.99	1.361
Perceived Benefits	**3.99**	**1.167**

The next highest score is from the item "Requires less in-house IT staff, costs" (*M*=3.99, *S.D* = 1.361). The lowest score is observed from the item "Monthly payments" (*M*=3.77, *S.D* = 1.285). It can also be observed that the standard deviation value is greater than 1 for all items and the construct. Andrade C, (2020) states that 99% of all data points will be within ±3SD from mean. From the above table, the mean value of perceived benefit construct is 3.99 which is almost 3SD.

Descriptive Statistics – Perceived Risks

Table 4.2.1-6 displays the mean score of each factor and their contribution towards the significant construct Perceived Risks factors. From the table, it can be observed that "Autoscaling of computational resources" (*M*=3.52, *S.D*=0.792) is having highest score contributing towards the major construct "Perceived Risks factors" (*M*=3.53 and *S.D* = 0.751).

Table 4.2.1 – 6: Descriptive Statistics – Perceived Risks

	Mean	**S.D**
AutoScaling of computational resources charges (CPU, RAM, etc. will get multiplied when load increases)	3.52	.792
Data Storage charges	3.54	.753
Perceived Risk	**3.53**	**.751**

The lowest score is observed from the item "Data Storage charges" (*M*=3.54, *S.D* = 0.753).

Descriptive Statistics – Technological and Environmental Factors

Table 4.2.1 – 7: Descriptive Statistics – Technological and Environmental Factors

	Mean	**S.D**
Relative Advantage (in terms of costs)	3.81	1.151
External Support (vendor charges)	3.41	0.796
Technological and Environmental Factors	**3.61**	**0.885**

Table 4.2.1-7 displays the mean score of each factor and their contribution towards the significant construct of Technological and Environmental factors. From the table, it can be observed that "Relative Advantage" (*M*=3.81, *S.D*=1.15) is having highest score contributing towards the major construct "Technological and Environmental factors" (*M*=3.61 and *S.D* = 0.885). The lowest score is observed from the item "External Support" (*M*=3.41, *S.D* = 0.796). It can also be observed that the standard deviation value is greater than 1 for item relative advantage and the construct. Andrade C, (2020) states that 99% of all data points will be within ±3SD from mean. From the above table, the mean value of perceived benefit construct is 3.61 which is almost 3SD.

Descriptive Statistics – Satisfaction_on_Decision

Now researcher finds the mean and standard deviation of all sub-constructs under "Satisfaction_on_Decision". The values of each item or sub-construct under "Satisfaction_on_Decision" will tell us the influence of each sub-construct on the overall Decision to adopt the cloud computing model. This will explain whether organizations are satisfied with their decision to adopt a cloud computing model from an on-premise model of the software product.

Table 4.2.1-8: Descriptive Statistics – Satisfaction on Decision

	Mean	**S.D**
Our decision to adopt On-cloud from On-premises was a wise decision	4.19	.905
Satisfied with the decision of adopting from On-premises to On-cloud	4.15	.919
Intent to go for On-cloud in all future adoption as well	4.08	.840
I am willing to recommend others to adopt from On-premises to On-cloud	4.16	.872
Satisfaction on Decision	**4.15**	**.755**

Table 4.2.1-8 above displays the mean score of each factor and their contribution towards the significant construct "Satisfaction_on_Decision". From the table, it can be observed that "Our decision to adopt cloud from On-premises was a wise decision" (*M*=4.19, *S.D* = 0.905) is having highest score contributing towards the significant construct "Satisfaction_on_Decision" (*M*=4.15 and *S.D* = 0.755). The next item follows this "I am willing to recommend others to adopt cloud

from On-premises" (*M*=4.16 and *S.D* = 0.872). The next highest score is from the item "Satisfied with the decision of adopting cloud from on-premises" (*M*=4.15 and *S.D* = 0.919). The lowest score is observed from the item "Intent to go for On-cloud in all future adoption as well" (*M*=4.08, *S.D* = 0.840).

Correlation

If it is determined that the data is not suitable for EFA from KMO and Bartlett's test of sphericity then, Correlation analysis is usually done to find the relationships among variables. One of the main methods of making the data suitable for factor analysis is to remove the variables that cause scattered correlation models from the data set. For this, it is checked whether there are pattern relations between the variables by applying the correlation matrix. A value of -1 indicates that the variables are opposite, which means if one goes up, then the other goes down. This is also known as a negative correlation. A value of 0 indicates that there is no relation among variables. A value of 1 indicates that the variables are positively correlated, which means if one goes up, the other also goes up, (Gupta & Kapoor, 2014).

Table 4.2.1-9: Correlation

	1	**2**	**3**	**4**	**5**
1. Organizational Factors	1				
2. Perceived Benefits	.619**	1			
3. Perceived Risk	.300**	.337**	1		
4. Technological and Environmental Factors	.339**	.421**	.220**	1	
5. Satisfaction on Decision	.717**	.626**	.218**	.395**	1

**. Correlation is significant at the 0.01 level (1-tailed).

Correlation is done to test the relationships among the significant constructs of the integrated research model, namely Technological factors, Organizational factors, Environmental factors, Perceived Benefit factors, Perceived Risks factors, and also outcome dependent variable Satisfaction_on_Decision. The Correlation's Significant(1-Tailed) value is 0.01, which is less than 0.05. Hence, the researcher can conclude that the relationships among the constructs of the integrated research model, namely Technological Factors, Organizational Factors, Environmental

Factors, Perceived Benefit factors, Perceived Risks factors, and outcome variable Decision to adopt, are statistically significant with positive relationships among them.

The output of Pearson product-momentum Correlation indicates that all the constructs of the integrated research model are positively correlated with each other and the outcome variable Satisfaction_on_Decision. Among all the constructs, the highest value of the outcome variable "Satisfaction_on_Decision" is with Organizational Factors. In this case, Pearson's r=0.717. The next highest positively correlated construct with outcome variable " Satisfaction_on_Decision" is "Perceived Benefits Factors" and Pearson's r=0.626 followed by the construct "Technological and Environmental Factors" with outcome variable " Satisfaction_on_Decision". In this case, Pearson's r=0.395. The lowest positively correlated construct with the outcome variable "Satisfaction_on_Decision" is "Perceived Risks Factors". In this case, Pearson's r=0.218.

The results of Pearson product-momentum Correlation also indicate that the construct "Perceived Benefits" is positively correlated with Organizational Factors and Pearson's r=0.619. This is followed by the "Perceived Benefits Factor" relationship with "Technological and Environmental Factor" where Pearson's r=0.421. Finally, the lowest value of Pearson's r=0.220 is indicated by the constructs "Perceived Risk Factor" and "Technological and Environmental Factor".

PLS-SEM using SMART-PLS for Economic Buyer – Adoption of cloud computing model from on-premise model

The Internal consistency, Convergent Validity, and Discriminant Validity of the variables of constructs resulting from the integrated research model are evaluated using PLS-SEM. The constructs resulting from the integrated research model are Technological Factors, Organizational Factors, Environmental Factors, Perceived Benefit Factors, and Perceived Risk Factors. The primary purpose of the model is to full fill the objectives of this research study. The model finds whether the constructs of Technological Factors, Organizational Factors, Environmental Factors, Perceived Benefit Factors, and Perceived Risk Factors influence the organization's decision to adopt an on-premise or cloud computing model of the enterprise software product, as stated earlier in a pilot study that for quantitative analysis, the scope of this study will be for organizations adopting cloud services from on-premise infrastructure.

There are fifteen manifest variables and six latent variables in economic buyer analysis, and they are presented in the table below.

Table 4.2.1 – 10: Constructs and Items Description

Construct	Item Code	Item	Reference
Technological Factors (TF)	**TF1**	Relative Advantage (in terms of costs)	Zhang et al., (2021)
Organizational Factors (OF)	**OF1**	Awareness level of IT team related to Cloud Computing model of software product (Do they need trainings. How much training costs)	Weerd et al., (2016)
	OF2	Top management support (in terms of Costs)	Weerd et al., (2016)
	OF3	Availability of the required organizational resources (financial)	Weerd et al., (2016)
	OF4	Size of the company or its IT unit (No. of employees)	Weerd et al., (2016)
Environmental Factors (EF)	**EF1**	External Support (vendor charges)	Yu et al., (2017)
Perceived Benefit Factors (PB)	**PB1**	Pay only for what you use (Cloud users will pay only for features being used in the product)	Wu et al., (2011)
	PB2	Monthly payments (Payment are done on monthly basis)	Wu et al., (2011)
	PB3	Requires less in-house IT staff, costs (Vendor will provide support to cloud infrastructure, Customer need not maintain IT staff, thus	Wu et al., (2011)

		saves costs of maintaining staff)	
Perceived Risks Factors (PR)	**PR1**	Autoscaling of computational resources charges (CPU, RAM, etc. will get multiplied when load increases)	Wu et al., (2011)
	PR2	Data Storage charges	Wu et al., (2011)
Satisfaction On Decision Outcome Variable (OV)	**OV1**	Our decision to adopt cloud model from on-premises model was a wise decision	
	OV2	Satisfied with the decision of adopting cloud model from on-premises	
	OV3	Intent to go for On-cloud in all future adoption as well	
	OV4	I am willing to recommend others to adopt cloud model from on-premises model	

Figure 4.2.1 – 1: Evaluation of Measurement Model

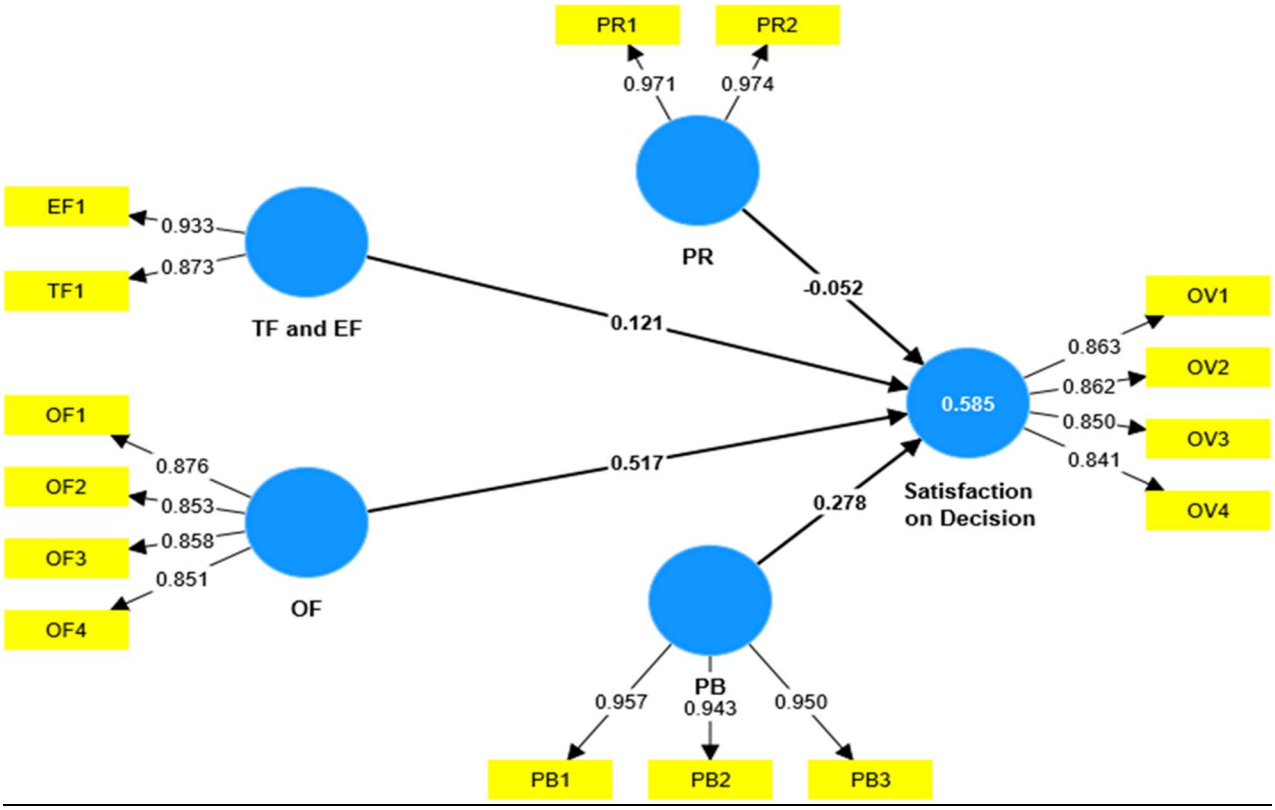


Figure 4.2.1-1 represents the evaluation of measurement model. It is to be noted that, Perceived risks construct value is negative which means it doesn't have any influence in satisfaction of decision otherwise customer will not adopt cloud model.

Table 4.2.1 – 11: Measurement Model- Reliability and Validity

Construct	Item	Outer Loading	Composite Reliability (rho_A)	Composite Reliability (rho_C)	Cronbach's Alpha	AVE
TF & EF	TF1	0.873	0.83	0.899	0.78	0.816
	EF1	0.933				
OF	OF1	0.876	0.886	0.919	0.883	0.739
	OF2	0.853				
	OF3	0.858				
	OF4	0.851				
PB	PB1	0.957	0.949	0.965	0.946	0.902
	PB2	0.943				
	PB3	0.950				

PR	PR1	0.971	0.944	0.972	0.942	0.946
	PR2	0.974				
OV	OV1	0.863	0.882	0.915	0.877	0.729
	OV2	0.862				
	OV3	0.850				
	OV4	0.841				

Internal Consistency:

Table 4.2.1-11 represents the composite reliability indicator variables. Cronbach's alpha is a standard measure for internal consistency and convergent validity. A value of 0.7 or higher is adequate to confirm the reliability of the constructs under consideration (Garson, 2016). The Cronbach's alpha values for the constructs Technological and Environmental, Organizational, Perceived Benefit and Perceived Risks and outcome variable Satisfaction_on_Decision are 0.78, 0.883, 0.946, 0942, and 0.877, respectively. Composite reliability(rho_A) is another measure necessary for evaluating the reliability and validity of each construct (Hair et al., 2006; Henseler et al., 2015). A value of 0.7 or higher composite reliability is a good fit for evaluating internal consistency. The composite reliability values for constructs Technological and Environmental, Organizational, Perceived Benefit and Perceived Risks and outcome variable Satisfaction_on_Decision are 0.83, 0.886, 0.949, 0.944, and 0.882, respectively. The rho_C coefficient represents the standard measure for the reliability and validity of each item in the construct. A value greater than 0.7 is adequate to guarantee the reliability and validity of the constructs (Hair et al., 2006; Henseler et al., 2015). The rho_C value for the constructs Technological and Environmental factor, Organizational factor, Perceived Benefit, and Perceived Risks, and outcome variable Satisfaction_on_Decision are 0.899, 0.919, 0.965, 0.972, and 0.915, respectively. Thus, the constructs do not have any Internal consistency reliability issues.

Convergent Validity:

The convergent validity of the constructs is measured using the outer loading score and Average Variance Extracted score. An outer loading value greater than 0.7 is adequate for stating that there is no indicator reliability issue (Hair et al., 2017). If the variables have outer loading score values between 0.4 to 0.7, they can be deleted if they are spiking an increase in the values of AVE and composite reliability; otherwise, the variables can be retained for further analysis (Hair et al., 2017). It can be noted from table 4.2.1-11 that all the variables have outer loading values of more

than 0.7, thus, all the items are considered for further analysis. The average variance extracted score is another measure for evaluating the validity of the constructs. A value greater than 0.5 is adequate to say that constructs have convergent validity (Hair et al., 2017; Henseler et al., 2015). From table 4.2.1-11, it can be noted that the constructs Technological and Environmental, Organizational, Perceived Benefit and Perceived Risks and outcome variable Satisfaction_on_Decision are having AVE values of 0.816, 0.739, 0.902, 0.946, and 0.729 respectively. Therefore, it is confirmed that the constructs do not have any issues related to convergent validity.

Discriminant Validity

Discriminant validity ensures that there exists a strong relationship between the reflective construct and its own indicators when compared to other constructs in the model (Hair et al., 2017).
Discriminant Validity can be determined by using the following methods:

- The Fornell-Larcker criterion,
- The Heterotrait-Monotrait ratio of correlations (HTMT) criterion results.

Discriminant Validity: Fornell-Larcker Criterion

Fornell & Larcker, (1981) has suggested a method of determining the discriminant validity of constructs. The square root of the AVE of latent variables is compared against the correlation values of constructs.

Table 4.2.1 – 12: Discriminant Validity (Fornell-Larcker Criterion)

	Organizational Factor	Perceived Benefits	Perceived Risk	Decision	Technological and Environmental Factors
Organizational Factor	**0.86**				
Perceived Benefits	0.614	**0.95**			
Perceived Risk	0.293	0.337	**0.972**		
Satisfaction on Decision	0.718	0.628	0.218	**0.854**	

Technological and Environmental Factors	0.375	0.408	0.203	0.418	**0.904**

In table 4.2.1 – 12, The square root values of AVE are highlighted in bold fonts and represented diagonally. It can also be observed that the square root values are more significant than their corresponding latent variables values represented in rows and columns. Therefore, it can be inferred that there are no discriminant validity issues in the model.

Discriminant Validity: Heterotrait-Monotrait ratio of correlations (HTMT)

Henseler et al., (2015) have suggested an alternative to determining discriminant validity. The approach is based on the multitrait-multimethod matrix. A value less than 0.9 is adequate to infer that there exists a discriminant validity between two reflective constructs.

Table 4.2.1 – 13: Discriminant Validity (HTMT Criterion)

	Organizational Factor	Perceived Benefits	Perceived Risk	Decision	Technological and Environmental Factors
Organizational Factor					
Perceived Benefits	**0.672**				
Perceived Risk	0.327	**0.358**			
Satisfaction on Decision	0.807	0.682	**0.241**		
Technological and Environmental Factors	0.438	0.482	0.247	**0.492**	

From table 4.2.1-13, it can be observed that the HTMT ratio for all constructs is less than 0.9. This means that discriminant validity has been established between the constructs.

Collinearity Statistics - Variance Inflation Factor (VIF)

Multi-collinearity exists when independent variables are inter-correlated. The measure which helps in determining the presence of multi-collinearity is the Variance inflation factor (VIF). A VIF score of less than 5.00 is adequate to consider that model has no multi-collinearity issues (Hair et al., 2017; Ramayah et al., 2018).

Table 4.2.1 – 14: Collinearity Statistics - Variance Inflation Factor (VIF)

	Organizational Factor	Perceived Benefits	Perceived Risk	Decision	Technological and Environmental Factors
Organizational Factor				1.673	
Perceived Benefits				1.769	
Perceived Risk				1.148	
Satisfaction on Decision					
Technological and Environmental Factors				1.241	

A multi-Collinearity test is conducted, and the results are presented in table 4.2.1-14. It can be noted that VIF test values are less than 5.00 for all constructs. Therefore, the model doesn't have collinearity issues.

Evaluating Structural Model

Alternate Hypotheses H1a is tested using a structural model. The structural model is bootstrapped to find the parameters like Path coefficient, weights, and the predictive relevance of the structural model.

Figure 4.2.1 – 2: SEM with the values of t tests obtained via the Bootstrapping module of SmartPLS

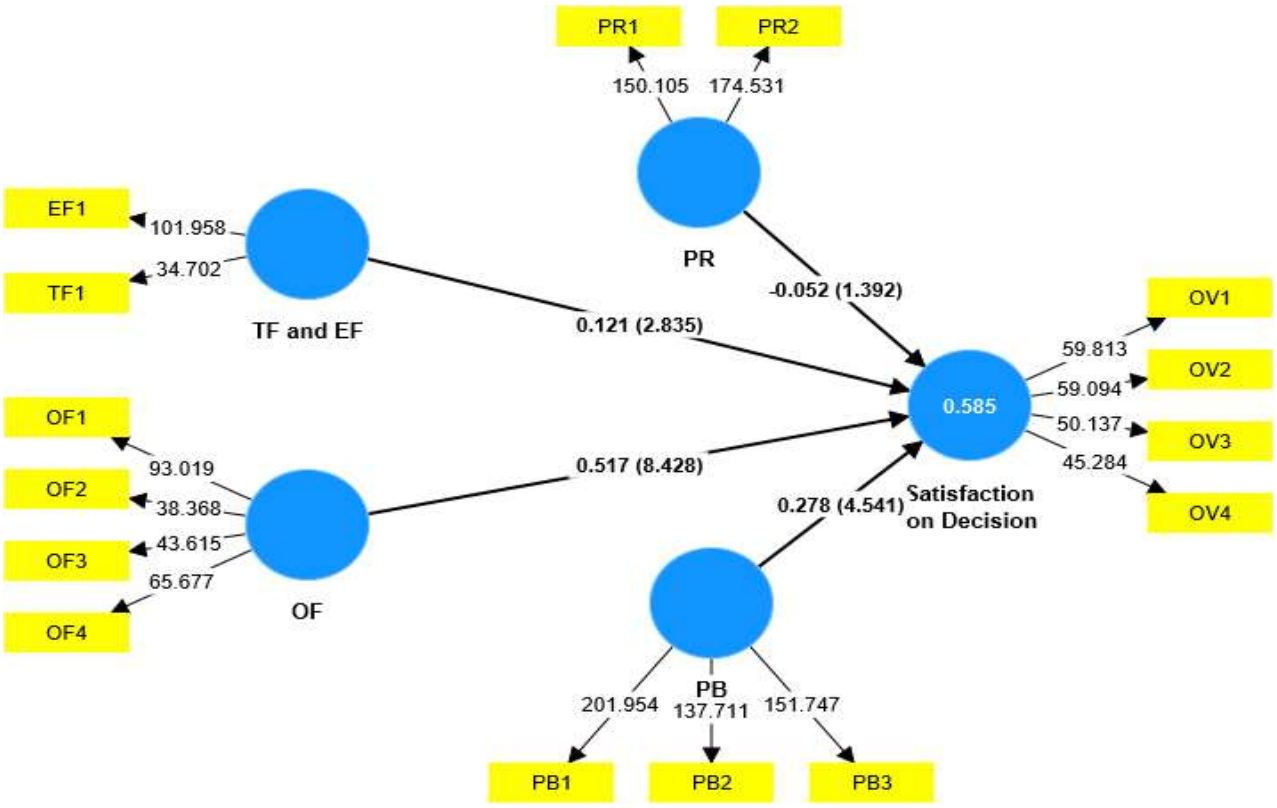


Figure 4.2.1-2 represents the bootstrapping of structural equation model t statistics values for different path coefficient values. It is to be noted that, Perceived risks construct value is negative which means it doesn't have any influence in satisfaction of decision otherwise customer will not adopt cloud model. The corresponding path-coefficients values with their P-values are also presented in table 4.2.1-15.

Table 4.2.1 – 15: Evaluation of Structural Equation Model (Bootstrapping SEM) - Different paths with their T-Statistics

PATH	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Organizational Factor -> Satisfaction_ on Decision	0.517	0.519	0.061	8.428	0.000
Perceived Benefits -> Satisfaction_ on Decision	0.278	0.278	0.061	4.541	0.000

Perceived Risk -> Satisfaction_ on Decision	-0.052	-0.051	0.037	1.392	0.164
Technological and Environmental Factors -> Satisfaction_ on Decision	0.121	0.121	0.043	2.835	0.005

The results of t-statistics are obtained by bootstrapping 404 samples in PLS-SEM. The bootstrapping procedure is performed to derive sub-samples of 10000 from the original samples of 404. The results of the t-test results for accepting or rejecting the structural path are presented in table 4.4.1-15. The results presented in the table represent statistical significance for both the structural (inner) model and measurement (outer) model. The *t*-value is calculated at a 5% level of significance value, and it is above the critical value of 1.96 for all structural paths except perceived risk -> decision. The table represents all outer loading of constructs and their corresponding *t*-values. All the t-values are above 2.58 except perceived risk -> decision. So, the SEM path perceived risk -> decision is non-significant for the hypothesis testing.

R-Square (Coefficient of determination)

Table 4.2.1 – 16: Evaluation of Structural Equation Model (Bootstrapping SEM) – R-Square

	R Square	**R Square Adjusted**
Satisfaction_ on Decision	0.585	0.581

Results of R- Square and R-Square Adjusted are presented in the above table 4.2.1-16. Chin (1998), in his book, described the contribution of all variables depending on R-Square values obtained. If the R-Square value is greater than 0.67, then the contribution of the variable is substantial. If the R-Square value is greater than 0.33, then the contribution of the variable is moderate. If the R-Square value is greater than 0.19, then the contribution of the variable is weak. The R-Square value obtained is 0.585, which is greater than the cut-off value of 0.33 for moderate contribution. This means 58.5% of variants can be explained by independent constructs of this study towards the dependent variable Satisfaction on Decision. It can also be observed from table 4.2.1-16 that the R-Square Adjusted value is very close to the Un-Adjusted R-Square 0.585. The R-Square Adjusted value is 0.581, which means the independent variables are having moderate contribution toward the dependent variable.

Cohen's F-Square (Size Effect)

Table 4.2.1 – 17: Evaluation of Structural Equation Model (Bootstrapping SEM) – Size Effect – F-Square

	Organization Factor	Perceived Benefits	Perceived Risks	Satisfaction_ on_Decision	TE & EF
Organizational Factor				0.385	
Perceived Benefits				0.106	
Perceived Risk				0.006	
Satisfaction_on_Decision					
Technological and Environmental Factors				0.028	

The F-Square size effect expresses how large a proportion of variance is responsible for R-Square change (Hair et al., 2017). The f-Square size effect is determined in three sizes, and they are .02 represents a small f-square effect size, 0.15 represents a medium f-square effect size, and 0.35 represents a high f-square effect size (Cohen, 1988). The f-square size effect for all constructs is presented in table 4.2.1-17. It can be observed that the organization factor has the strongest impact on the decision with value f-square = 0.385 > 0.35. The factor Perceived Benefit has an f-square value = 0.106 > 0.02 and has a small size effect. Similarly, the Technological and environmental factor has an f-square value = 0.028 > 0.02 and has a small size effect. Finally, Perceived Risk has an f-square value = 0.006 < 0.02 which means there is no size effect of perceived risk.

Q-Square (Predictive Relevance)

Table 4.2.1 – 18: Evaluation of Structural Equation Model (Bootstrapping SEM) – Predictive Relevance – Q-Square

	Q^2 Predict	**RMSE**	**MAE**
Satisfaction_ on Decision	0.57	0.659	0.48

Q-Square (Predictive relevance or Predictive Accuracy) evaluates the cross-validated redundancy for a reflective modeled endogenous factor (GEISSER, 1974; Stone, 1974). Q-Square values are determined using the blindfolded algorithm for each endogenous factor in the model. Q-Square value greater than zero is adequate to indicate that the model is relevant to predict the factor (Hair et al., 2017). Q-Square value is presented in Table 4.2.1-18. It can be observed that Q-Square = 0.57 > 0, which satisfies the condition. Therefore, the build model has predictive relevance.

4.2.2 Technical Buyer and End user's Data Analysis and Interpretation

Table 4.2.2-1 represents the organizational profile of the respondents from various types of industries with various sizes of organizations. The people designated for technical and end-user decisions in the evaluation of IT infrastructure in an organization are IT Managers, IT Staff, and IT Admins.

Table 4.2.2-1: Organizational Profile of Technical buyers and End users

		Count	Column N %
Organizational Size	1-49 employees	96	23.8%
	50-249 employees	32	7.9%
	>250 employees	276	68.3%
Organizational Age	5-10 Years	105	26.0%
	10-15 Years	131	32.4%
	15-20 Years	69	17.1%
	>20 Years	99	24.5%
Type of Industry	IT	148	36.6%
	E-commerce	81	20.0%
	Pharmaceutical	118	29.2%
	Financial Institutions and Banks	57	14.1%
	Graduate	306	75.74%
	Postgraduate	98	24.26%
Age of Respondents	20-30 Years	40	9.9%
	31-40 Years	319	78.9%
	41-50 Years	45	11.1%
Designation	IT Manager	111	27.5%
	IT Staff/Admin	293	72.5%

	IT Procurement Manager	0	0.0%

Now researcher presents the analysis and interpretation of data collected based on the objectives of the research study. This includes analysis of the demographic profile of the respondents, Exploratory Factor Analysis, Correlational analysis, and Structural equation modeling has been done to identify the relationship between the sub-constructs of Technological factors, organizational factors, environmental factors, perceived benefits factors, and perceived risks factors.

Exploratory Factor Analysis – Technical buyer and End user

It is necessary to test whether the dataset is suitable for EFA or not. To achieve this, the results of the Kaiser-Meyer-Olkin Measure (KMO) and Bartlett's Sphericity Tests should be firstly checked. Bartlett's Test of Sphericity and the Kaiser- Meyer-Olkin Sampling Adequacy Test (KMO) are widely used in literature to determine the strength of relationships and evaluate the factorability of variables. While KMO provides information on sample adequacy, Bartlett's Test of Sphericity also provides information on whether the dataset has pattern relationships. KMO and Bartlett's tests are conducted on data to determine sample adequacy. If the KMO test value is above 0.50, then it means that the sample is adequate; otherwise, if the value is less than 0.50, then it means that it is not adequate (Kaiser & Rice, 1974). Similarly, Bartlett's test value of less than 0.05 means that the sample is adequate otherwise, if the value is greater than 0.05, then it means that it is not adequate (Dziuban & Shirkey, 1974). The results from both tests were administered to find the adequacy of the sample for collecting the opinion of the Organization's decision to adopt the cloud computing model from the on-premise model of the software product from a technical buyer viewpoint perspective.

Table 4.2.2-2: KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.914
Bartlett's Test of Sphericity	Approx. Chi-Square	18603.614
	df	325
	Sig.	.000

An exploratory factor analysis test is conducted to group all the variables under a common construct. Principal component analysis using varimax rotation is used to determine the factorability between 26 variables for the Organization's decision to adopt a cloud computing model from the on-premise model of the software product from the technical buyer's viewpoint. The main purpose of the rotation is to obtain an optimally simple structure that tries to load each variable on as few factors as possible, but while doing this, maximizes the number of high loads on each variable. The simple structure means that each factor has highly loaded variables and the rest are low-loaded. Obtaining an optimal simple structure indirectly facilitates interpretation and allows each factor to define a separate set of interrelated variables (Tabachnick & Fidel, 2001).

The variables which were loading above 0.5 are considered for further analysis. Kaiser-Meyer-Olkin measure and Bartlett's test of sphericity are used to find the sample adequacy. The results from the test show that the KMO test score (KMO=0.914) is more than the recommended value. The result from Bartlett's test of sphericity ($\chi 2 = 18603.614$, $p < 0.001$) not only signifies but also confirms that the sample is adequate for gathering the technical buyer's viewpoint. An exploratory factor analysis test is conducted to group all the variables under a common construct. Principal component analysis using varimax with Kaiser Normalization is used to determine the factorability between 26 variables for the Organization's decision to adopt a cloud computing model from the on-premise model of the software product from the technical buyer's viewpoint. The communality value for individual factors is greater than 0.5, which means that all factors should be included for further analysis. The variables having Eigenvalue greater than 1 are extracted, resulting in five sets of factors. The total variance value is 88.661, which signifies that the factors are accountable for the Organization's decision to adopt the cloud computing model from the on-premise model of the software product.

Table 4.2.2-3 displays the Rotated component matrix, which helps in determining the loading of items along with relevant factors. The factors whose value is less than 0.5 while loading is deleted because these factors do not meet the KMO threshold value of 0.5.

Table 4.2.2-3: Rotated Component Matrix

Rotated Component Matrix[a]

	Commu-nlaites	Component 1	2	3	4	5
Single Sign-on process (Ease of use, authentication to one product will authorize to different products)	0.931	**0.944**	0.051	-0.152	-0.036	-0.11
Easy and fast to deploy to end-users	0.873	**0.916**	-0.158	-0.001	-0.096	-0.029
Always offers latest functionally (All new features are supported in Cloud due to monthly releases)	0.925	**0.914**	0.195	-0.18	-0.01	-0.14
Data Accessibility (Data is Accessible to users when needed)	0.921	**0.908**	-0.127	-0.215	-0.165	-0.08
Data locality (Data location is in local geography)	0.919	**0.906**	-0.132	-0.227	-0.153	-0.071
Data Availability (Data is available to legitimate users using High availability and redundancy)	0.92	**0.893**	-0.207	-0.226	-0.132	-0.104
Sharing systems with partners simpler (Just need to create an account)	0.865	**0.892**	-0.148	-0.189	-0.087	-0.059
Encourages standard systems (Supports shifting between different cloud providers)	0.878	**0.892**	-0.157	-0.206	-0.126	-0.001
Data security (Data is secured when stored in cloud servers)	0.788	**0.878**	-0.115	-0.054	-0.03	-0.012
Network and web application security (Design of network and application security in cloud)	0.79	**0.865**	-0.165	-0.117	0.004	-0.001
Data Privacy (Provider ensure secure separate segregation of data at physical layer)	0.982	-0.04	**0.966**	0.175	0.087	0.088
Data integrity (Guarantee that data is not tampered when stored in cloud servers)	0.949	-0.091	**0.914**	0.178	-0.006	0.27
Application Sensitivity (Software might have IPR which cannot be exposed in Cloud)	0.966	-0.172	**0.899**	0.286	0.081	0.2
Virtualization vulnerability (Virtualization software of Cloud vendor is not vulnerable)	0.864	-0.207	**0.803**	0.274	0.275	-0.158
Data backup (daily/weekly/monthly back up of data. In case of failure, restore last backup)	0.934	-0.222	**0.801**	0.379	0.3	-0.094
Identity Management (How identities are secured)	0.856	-0.212	**0.785**	0.293	0.297	-0.143

Authentication and authorization (Authentication to legitimate users and they are authorized to access resources)	0.825	0.155	**0.783**	-0.119	-0.195	0.369
Complexity (Ease of Use)	0.938	-0.215	0.203	**0.915**	0.069	0.094
Trialability (experiment the product before decision)	0.949	-0.218	0.209	**0.909**	0.132	0.117
Observability (observe the results during experiment)	0.836	-0.247	0.05	**0.811**	0.334	0.059
Compatibility (with existing IT infrastructure)	0.804	-0.112	0.381	**0.791**	0.144	0.005
Relative advantage (in terms of Technology)	0.903	-0.317	0.414	**0.78**	0.153	0.002
Availability of the required organizational resources (IT expertise, and/or IT infrastructure)	0.915	-0.115	0.22	0.232	**0.89**	0.083
Top management support (in terms of technology and innovation)	0.936	-0.226	0.154	0.356	**0.841**	0.167
Government support (Technology Support regulations)	0.768	-0.17	0.162	0.117	0.177	**0.817**
External support (Customer Support/Online Forums)	0.818	-0.353	0.565	0.165	0.059	**0.586**
Total Variance Explained (88.66%)		**33.87%**	**23.64%**	**17.45%**	**8.16%**	**5.54%**

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 6 iterations.

Ten out of twenty-six items in this scope, namely “Single Sign-on process”, “Easy and fast to deploy to end-users”, “Always offers latest functionally”, “Data Accessibility”, “Data locality”, “Data Availability”, “Sharing systems with partners simpler”, “Encourages standard systems”, “Data security”, “Network and web application security” were loaded as “Factor1”. “Factor 1” is the key element for finding the influence of factors on an organization’s decision to adopt the cloud computing model from an on-premise model of a software product during the investigation. In fact, “Factor 1” also helped explain the total variance of 33.870 percent on adopting the cloud computing model from the on-premise model of the software product. The second set of factors, termed "Factor 2" is loaded with items, namely “Data Privacy”, “Data integrity”, “Application Sensitivity”, “Virtualization vulnerability”, “Data backup”, “Identity Management”, and “Authentication and authorization” in the original scale. “Factor 2” has helped in explaining the

57.510 percent variance in adopting the cloud computing model of the software product from an on-premise model. The third set of factors termed "Factor 3" is loaded with items, namely “Complexity”, “Trialability”, “Observability”, “Compatibility”, and “Relative advantage” in the original scale. “Factor 3” has helped in explaining the 74.962 percent variance in adopting the cloud computing model of the software product from the on-premise model. The fourth set of factors, termed "Factor 4" is loaded with items namely “Availability of the required organizational resources” and “Top management support” in the original scale. “Factor 4” has helped in explaining the 83.119 percent variance in adopting the cloud computing model of the software product from the on-premise model. The fifth set of factors termed "Factor 5" is loaded with items namely “Government support”, and “External support” in the original scale. “Factor 5” has helped in explaining the 88.661 percent of the variance in adopting to cloud computing model of the software product from the on-premise model.

Mean and Standard Deviation are calculated as part of Descriptive statistics. These values will signify the influence of each sub-construct on the overall construct.

Descriptive Statistics - Technological Factors

Now, the researcher finds the mean and standard deviation of all sub-constructs under Technological factors. The values of each item or sub-construct under Technological factors will tell us the influence of each sub-construct on overall Technological factors. This will explain how Technological factors and their sub-constructs influence an organization’s decision to adopt the cloud computing model from the On-Premise model of the software product.

Table 4.2.2-4: Descriptive Statistics - Technological Factors

	Mean	**S.D**
Relative advantage (in terms of Technology)	4.36	0.904
Compatibility (with existing IT infrastructure)	3.82	0.623
Complexity (Ease of Use)	4.68	0.572
Trialability (experiment the product before decision)	4.69	0.579
Observability (observe the results during experiment)	4.62	0.588

Technological Factors	4.43	0.603

Table 4.2.2-4 displays the mean score of each factor and their contribution towards the major construct Technological factors. From the table, it can be observed that "Trialability" (*M*=4.69, *S.D* = 0.579) is having highest score contributing towards the significant construct "Technological Factors" (*M*=4.43 and *S.D* = 0.603). The next highest score is from the item "Complexity" (*M*=4.68, *S.D* = 0.572), followed by the item "Observability" (*M*=4.62, *S.D* = 0.588) and then followed by the item "Relative advantage" (*M*=4.36, *S.D* = 0.904). The lowest score is observed from the item "Compatibility" (*M*=3.82, *S.D* = 0.623).

Descriptive Statistics - Organizational Factors

Now researcher finds the mean and standard deviation of all sub-constructs under Organizational factors. The values of each item or sub-construct under Organizational factors will tell us the influence of each sub-construct on overall Organizational factors. This will explain how Organizational factors and their sub-constructs influence an organization's decision to adopt the cloud computing model from the on-premise model of the software product.

Table 4.2.2-5: Descriptive Statistics - Organizational Factors

	Mean	**S.D**
Top management support (in terms of technology and innovation)	4.10	1.117
Availability of the required organizational resources (IT expertise, and/or IT infrastructure)	3.59	0.704
Organizational Factors	3.84	0.889

Table 4.2.2-5 displays the mean score of each factor and their contribution toward the major construct of Organizational factors. From the table, it can be observed that "Top management support" (*M*=4.10, *S.D* = 1.117) is having highest score contributing towards the major construct "Organizational Factors" (*M*=3.84 and *S.D* = 0.889). The lowest score is observed from the item "Availability of the required organizational resources" (*M*=3.59, *S.D* = 0.704). It can also be observed that the standard deviation value is greater than 1 for item top management support. Andrade C, (2020) states that 99% of all data points will be within ±3SD from mean.

Descriptive Statistics - Environmental Factors

Now researcher finds the mean and standard deviation of all sub-constructs under Environmental factors. The values of each item or sub-construct under Environmental factors will tell us the influence of each sub-construct on overall Environmental factors. This will explain how Environmental factors and their sub-constructs influences an organization's decision to adopt the cloud computing model from the On-Premise model of the software product.

Table 4.2.2-6 displays the mean score of each factor and their contribution towards the major construct of Environmental factors.

Table 4.2.2-6: Descriptive Statistics - Environmental Factors

	Mean	S.D
External support (Customer Support/Online Forums)	3.01	0.841
Government support (Technology Support regulations)	4.24	1.055
Environmental Factors	**3.63**	**0.842**

From the above table, it can be observed that "Government support" (*M*=4.24, *S.D* = 1.055) is having highest score contributing towards the significant construct "Environmental Factors" (*M*=3.63 and *S.D* = 0.842). The lowest score is observed from the item "External support" (*M*=3.01, *S.D* = 0.841). It can also be observed that the standard deviation value is greater than 1 for items government support. Andrade C, (2020) states that 99% of all data points will be within ±3SD from mean.

Descriptive Statistics - Perceived Benefits

Now researcher finds the mean and standard deviation of all sub-constructs under Major construct Perceived Benefits. The values of each item or sub-construct under Perceived Benefits will tell us the influence of each sub-construct on overall Perceived Benefits. This will explain how Perceived

Benefits factors and their sub-constructs influence an organization's decision to adopt the cloud computing model from the On-Premise model of the software product.

Table 4.2.2-7: Descriptive Statistics - Perceived Risks

	Mean	**S.D**
Easy and fast to deploy to end-users	2.33	0.720
Encourages standard systems (Supports shifting between different cloud providers)	1.80	1.134
Always offers latest functionally (All new features are supported in Cloud due to monthly releases)	2.46	0.797
Sharing systems with partners simpler (Just need to create an account)	1.85	1.188
Single Sign-on process (Ease of use, authentication to one product will authorize to different products)	2.40	0.692
Data Availability (Data is available to legitimate users using High availability and redundancy)	1.76	1.175
Data Accessibility (Data is Accessible to users when needed)	1.78	1.211
Data locality (Data location is in local geography)	1.77	1.197
Data security (Data is secured when stored in cloud servers)	3.25	0.634
Network and web application security (Design of network and application security in cloud)	3.26	0.610
Perceived Benefits	2.27	0.872

Table 4.2.2-7 displays the mean score of each factor and their contribution towards the major construct Perceived Benefits. From the table, it can be observed that "Network and web application security" (*M*=3.26, *S.D* = 0.610) is having highest score contributing towards the major construct "Perceived Benefits" (*M*=2.27 and *S.D* = 0.872). The next highest score can be observed from the item "Data security" (*M*=3.25 and *S.D* = 0.634), followed by the item "Always offers latest functionally" (*M*=2.46 and *S.D* = 0.797). The next highest score is reported by the item "Single Sign-on process" (*M*=2.40 and *S.D* = 0.692) and then by the item "Easy and fast to deploy to end-users" (*M*=2.33, *S.D* = 0.720) followed by the item "Sharing systems with partners simpler" (*M*=1.85, *S.D* = 1.188). The next highest score is reported by the item "Encourages standard

systems" (*M*=1.80, *S.D* = 1.134), then by the item "Data Accessibility" (*M*=1.78, *S.D* = 1.211). The next highest score can be observed from the item "Data locality" (*M*=1.77, *S.D* = 1.197). Finally, the lowest score is observed from the item "Data Availability" (*M*=1.76, *S.D* = 1.175). It can also be observed that the standard deviation value is greater than 1 for items Encourages standard systems, Sharing systems with partners simpler, Data Availability, Data Accessibility, Data locality. Andrade C, (2020) states that 99% of all data points will be within ±3SD from mean.

Descriptive Statistics - Perceived Risks

Now researcher finds the mean and standard deviation of all sub-constructs under Major construct Perceived Risks. The values of each item or sub-construct under Perceived Benefit will tell us the influence of each sub-construct on overall Perceived Risks. This will explain how Perceived Risks factors and their sub-constructs influences an organization's decision to adopt the cloud computing model from the On-Premise model of the software product.

Table 4.2.2-8: Descriptive Statistics - Perceived Risks

	Mean	**Std. Deviation**
Data integrity (Guarantee that data is not tampered when stored in cloud servers)	3.39	1.183
Authentication and authorization (Authentication to legitimate users and they are authorized to access resources)	2.69	1.651
Data Privacy (Provider ensure secure separate segregation of data at physical layer)	3.18	0.927
Application Sensitivity (Software might have IPR which cannot be exposed in Cloud)	3.07	0.757
Virtualization vulnerability (Virtualization software of Cloud vendor is not vulnerable)	3.78	0.650
Data backup (daily/weekly/monthly back up of data. In case of failure, restore last backup)	3.57	0.982
Identity Management (How identities are secured)	3.76	0.671
Perceived Risks	**3.35**	**0.862**

Table 4.2.2-8 displays the mean score of each factor and their contribution towards the major construct Perceived Risks. From the table, it can be observed that "Virtualization vulnerability" (*M*=3.78, *S.D* = 0.650) is having highest score contributing towards the major construct "Perceived Risks" (*M*=3.35 and *S.D* = 0.862). The next highest score can be observed from the item "Identity Management" (*M*=3.76 and *S.D* = 0.671), followed by the item "Data backup" (*M*=3.57 and *S.D* = 0.982). The next highest score is reported by the item "Data integrity" (*M*=3.39 and *S.D* = 1.183) and then by the item "Data Privacy" (*M*=3.18, *S.D* = 0.927) followed by the item "Application Sensitivity" (*M*=3.07, *S.D* = 0.757). Finally, the lowest score is observed from the item "Authentication and authorization" (*M*=2.69, *S.D* = 1.651). It can also be observed that the standard deviation value is greater than 1 for items Data Integrity, Authentication, and authorization. Andrade C, (2020) states that 99% of all data points will be within ±3SD from mean.

Descriptive Statistics – Satisfaction_on_Decision

Now researcher finds the mean and standard deviation of all sub-constructs under Satisfaction_on_Decision. The values of each item or sub-construct under Satisfaction_on_Decision will tell us the influence of each sub-construct on overall Satisfaction_on_Decision. This will explain whether organizations are satisfied with their decision to adopt the cloud computing model from the on-premise model of the software product.

Table 4.2.2-9: Descriptive Statistics - Decision

	Mean	**S.D**
Our decision to adopt from On-premises to On-cloud was a wise decision	4.39	0.828
Satisfied with the decision of adopting from On-premises to On-cloud	4.41	0.808
Intent to go for On-cloud in all future adoption as well	4.37	0.857
I am willing to recommend others to adopt On-cloud from On-premises	4.38	0.839
Decision	**4.39**	**0.790**

Table 4.2.2-9 displays the mean score of each factor and their contribution towards the major construct "Satisfaction_on_Decision". From the table, it can be observed that "Satisfied with the decision of adopting cloud from on-premise" (*M*=4.41, *S.D* = 0.808) is having highest score contributing towards the major construct "Satisfaction_on_Decision" (*M*=4.39 and *S.D* = 0.790). This is followed by the next item, "Our decision to adopt cloud from On-premises was a wise decision" (*M*=4.39 and *S.D* = 0.828). The next highest score is from the item "I am willing to recommend others to adopt cloud from on-premises" (*M*=4.38 and *S.D* = 0.839). The lowest score is observed from the item "Intent to go for On-cloud in all future adoption as well" (*M*=4.37, *S.D* = 0.857).

Correlations

If it is determined that the data is not suitable for EFA from KMO and Bartlett's test of sphericity then, Correlation analysis is usually done to find the relationships among variables. A value of -1 indicates that the variables are opposite, which means if one goes up, then the other goes down. This is also known as a negative correlation. A value of 0 indicates that there is no relation among variables. A value of 1 indicates that the variables are positively correlated, which means if one goes up, the other also goes up.

Table 4.2.2-10: Correlations

Correlations

Pearson Correlation

	Technological Factors	Organizational Factors	Environmental Factors	Perceived Risk	Perceived Benefits	Dec
Technological Factors	1					
Organizational Factors	.555**	1				
Environmental Factors	.386**	.363**	1			
Perceived Risk	-.463**	-.361**	-.410**	1		
Perceived Benefits	.494**	.353**	.526**	-.248**	1	
Satisfaction_on_Decision	.706**	.602**	.448**	-.560**	.628**	1

**. Correlation is significant at the 0.01 level (1-tailed).

Correlation is done to test the relationships among the primary constructs of the integrated research model, namely Technological factors, Organizational factors, Environmental factors, Perceived Benefit, Perceived Risk, and also outcome dependent variable "Satisfaction_on_Decision". The Correlation's Significant(1-Tailed) value is 0.01, which is less than 0.05. Hence, the researcher can conclude that the relationships among the constructs of the integrated research model, namely Technological Factors, Organizational Factors, Environmental Factors, Perceived Benefit, and outcome variable Decision "Satisfaction_on_Decision" are statistically significant with positive relationships among them. There is only one construct, Perceived Risk, which is negatively related to the outcome variable "Satisfaction_on_Decision".

The output of Pearson product-momentum Correlation indicates that all the constructs of the integrated research model are positively correlated with each other and outcome variable satisfaction. Among all the constructs, the highest value of the outcome variable "Satisfaction_on_Decision" is with Technological Factors. In this case, Pearson's r=0.706. The next highest positively correlated construct with the outcome variable "Satisfaction_on_Decision" is Perceived Benefit and Pearson's r=0.628. The next highest positively correlated construct with outcome variable "Satisfaction_on_Decision" is Organizational Factors and Pearson's r=0.602 followed by the construct Environmental Factor with outcome variable "Dec". In this case, Pearson's r=0.448. However, it is to be noted that the construct Perceived Risk is negatively correlated with the outcome variable "Satisfaction_on_Decision" and Pearson's r = -0.560.

The results of Pearson product-momentum Correlation also indicate that the construct Perceived Benefit Factor is positively correlated with Technological, Organizational, and Environmental Factors with Pearson's r = 0.494, 0.353, 0.526, respectively. This is followed by Technological Factor's relationship with Environmental Factors, where Pearson's r=0.407. Finally, the lowest value of Pearson's r=0.353 is indicated by the construct's Environmental Factors and Organizational Factors. From Table 4.2.2-10, it should also be noted that the Environmental factor is positively correlated with the Technological and Organizational factors with Pearson's r = 0.386, and 0.363, respectively. Finally, there also exist a correlation between Organizational and Technological factor with Pearson's r = 0.555.

PLS -SEM using SMART-PLS for Technical Buyer & End-User – Adopting cloud computing model from on-premise

The Internal consistency, Convergent Validity, and Discriminant Validity of the variables of constructs resulting from the integrated research model are evaluated using PLS-SEM. The constructs resulting from the integrated research model are Technological Factors, Organizational Factors, Environmental Factors, Perceived Benefit Factors, and Perceived Risk Factors. The main purpose of the model is to full fill the objectives of this research study. The model finds whether the constructs of Technological Factors, Organizational Factors, Environmental Factors, Perceived Benefit Factors, and Perceived Risk Factors influence the organization's decision to adopt an on-premise or cloud computing model of the enterprise software product. As stated earlier in the pilot study, for quantitative analysis, the scope of this study will be for organizations adopting cloud services from on-premise infrastructure.

There are thirty manifest variables and six latent variables in Technical buyer & End-user analysis, and they are presented in the table below.

Table 4.2.2 – 11: Constructs and Items Description

Construct	Item Code	Item
Technological Factors (TF)	**TF1**	Relative advantage (in terms of Technology)
	TF2	Compatibility (with existing IT infrastructure)
	TF3	Complexity (Ease of Use)
	TF4	Trialability (experiment the product before decision)
	TF5	Observability (observe the results during experiment)
Organizational Factors (OF)	**OF1**	Top management support (in terms of technology and innovation)
	OF2	Availability of the required organizational resources (IT expertise, and/or IT infrastructure)

Environmental Factors (EF)	**EF1**	External support (Customer Support/Online Forums)
	EF2	Government support (Technology Support regulations)
Perceived Benefit (PB)	**PB1**	Easy and fast to deploy to end-users
	PB2	Encourages standard systems (Supports shifting between different cloud providers)
	PB3	Always offers latest functionally (All new features are supported in Cloud due to monthly releases)
	PB4	Sharing systems with partners simpler (Just need to create an account)
	PB5	Single Sign-on process (Ease of use, authentication to one product will authorize to different products)
	PB6	Data Availability (Data is available to legitimate users using High availability and redundancy)
	PB7	Data Accessibility (Data is Accessible to users when needed)
Perceived Risks (PR)	**PR1**	Data locality (Data location is in local geography)
	PR2	Data security (Data is secured when stored in cloud servers)
	PR3	Network and web application security (Design of network and application security in cloud)
	PR4	Data integrity (Guarantee that data is not tampered when stored in cloud servers)
	PR5	Authentication and authorization (Authentication to legitimate users and they are authorized to access resources)

	PR6	Data Privacy (Provider ensure secure separate segregation of data at physical layer)
	PR7	Application Sensitivity (Software might have IPR which cannot be exposed in Cloud)
	PR8	Virtualization vulnerability (Virtualization software of Cloud vendor is not vulnerable)
	PR9	Data backup (daily/weekly/monthly back up of data. In case of failure, restore last backup)
	PR10	Identity Management (How identities are secured)
Outcome Variable (OV)	**OV1**	Our decision to adopt cloud from On-premises was a wise decision
	OV2	Satisfied with the decision of adoption On-cloud from On-premises
	OV3	Intent to go for On-cloud in all future adoption as well
	OV4	I am willing to recommend others to adopt On-cloud from On-premises

Figure 4.2.2-1 represents the evaluation of measurement. It is to be noted that, Perceived risks construct value is negative which means it doesn't have any influence in satisfaction of decision otherwise customer will not adopt cloud model.

Figure 4.2.2 – 1: Evaluation of Measurement Model

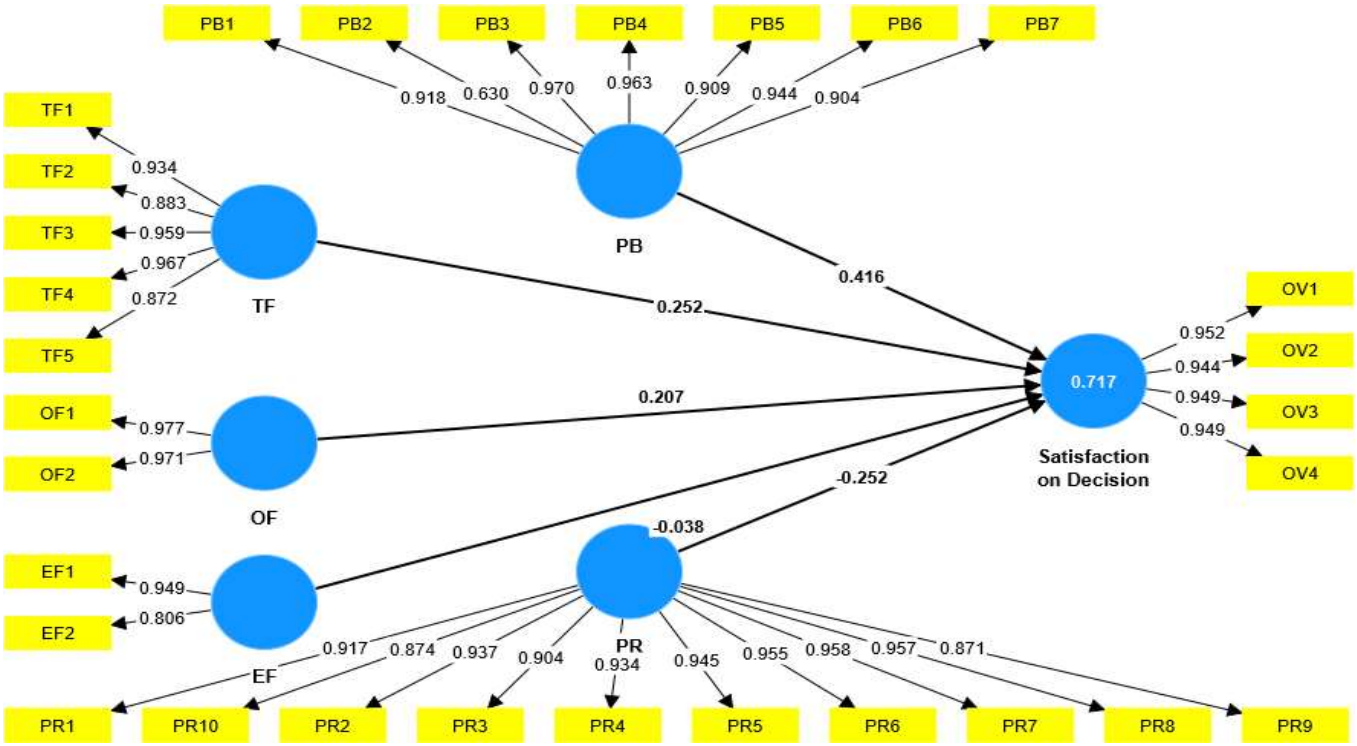


Table 4.2.2 – 12: Evaluation of Measurement Model- Technical Buyers and End Users response for Adopting Cloud Computing from on-premise model.

Construct	Item	Outer Loading	Composite Reliability (rho_A)	Composite Reliability (rho_C)	Cronbach's Alpha	AVE
TF	TF1	0.934	0.964	0.967	0.957	0.854
	TF2	0.883				
	TF3	0.959				
	TF4	0.967				
	TF5	0.872				
OF	OF1	0.977	0.956	0.974	0.947	0.949
	OF2	0.971				
EF	EF1	0.949	0.946	0.873	0.734	0.776
	EF2	0.806				
PB	PB1	0.918	0.981	0.966	0.959	0.806
	PB2	0.630				
	PB3	0.970				
	PB4	0.963				
	PB5	0.909				

	PB6	0.944				
	PB7	0.904				
PR	PR1	0.917	0.988	0.984	0.981	0.857
	PR2	0.937				
	PR3	0.904				
	PR4	0.934				
	PR5	0.945				
	PR6	0.955				
	PR7	0.958				
	PR8	0.957				
	PR9	0.871				
	PR10	0.874				
Satisfaction_on_Decision	OV1	0.952	0.964	0.973	0.963	0.9
	OV2	0.944				
	OV3	0.949				
	OV4	0.949				

Internal Consistency:

Table 4.2.2-12 represents the composite reliability indicator variables. Cronbach's alpha is a common measure for both Internal consistency and Convergent validity. A value of 0.7 or higher is adequate to confirm the reliability of the constructs under consideration (Garson, 2016). The Cronbach's alpha values for the constructs Technology, Organization, Environment, Perceived Benefit and Perceived Risks, and outcome variable Satisfaction_on_Decision are 0.957, 0.947, 0.734, 0.959, 0981, and 0.963, respectively. Composite reliability(rho_A) is also another measure necessary for evaluating internal consistency, it represents the common measure for the reliability and validity of the constructs. A value of 0.7 or higher composite reliability is a good fit for evaluating internal consistency (Hair et al., 2006; Henseler et al., 2015). The composite reliability(rho_A) values for constructs Technology, Organization, Environment, Perceived Benefit and Perceived Risks, and outcome variable Satisfaction_on_Decision is 0.964, 0.956, 0.946, 0.981, 0.988, and 0.964, respectively. The composite reliability(rho_C) coefficient represents the validity of each item in the construct. A value greater than 0.7 is adequate to guarantee the reliability and validity of the constructs (Hair et al., 2006; Henseler et al., 2015). The rho_C value for the constructs Technology, Organization, Environment, Perceived Benefit and Perceived Risks and outcome variable Satisfaction_on_Decision is 0.967, 0.974, 0.873, 0.966, 0.984, and 0.973, respectively. Thus, the constructs do not have any Internal consistency reliability issues.

Convergent Validity:

The convergent validity of the constructs is measured using the outer lading score and Average variance extracted score. An outer loading value greater than 0.7 is adequate for stating that there is no indicator reliability issue (Hair et al., 2017). If the variables have outer loading score values between 0.4 to 0.7, then they can be deleted if and only if they are spiking an increase in the values of AVE and composite reliability; otherwise, the variables can be retained for further analysis (Hair et al., 2017). It can be noted from table 4.2.2-12 that all the variables have outer loading values of more than 0.7. The average variance extracted score is another measure for evaluating the validity of the constructs. A value greater than 0.5 is adequate to say that constructs have convergent validity (Hair et al., 2017; Henseler et al., 2015). From table 4.2.2-12, it can be noted that the constructs Technology, Organization, Environment, Perceived Benefit and Perceived Risks and outcome variable Satisfaction_on_Decision are having AVE values of 0.854, 0.949, 0.776, 0.806, 0.857 and 0.9 respectively. Therefore, it is confirmed that the constructs do not have any issues related to convergent validity.

Discriminant Validity

Discriminant validity ensures that there exists a strong relationship between the reflective construct and its own indicators when compared to other constructs in the model (Hair et al., 2017).
Discriminant Validity can be determined by using the following methods:

- The Fornell-Larcker criterion,
- The Heterotrait-Monotrait ratio of correlations (HTMT) criterion results.

Discriminant Validity: Fornell-Larcker Criterion

Fornell & Larcker (1981) has suggested a method of determining the discriminant validity of constructs. The square root of the AVE of latent variables is compared against the correlation values of constructs.

Table 4.2.2 – 13: Discriminant Validity (Fornell-Larcker Criterion)

	Environmental Factors	Organizational Factors	Perceived Benefit	Perceived Risk	Satisfaction_on_Decision	Technological Factors
Environmental Factors	**0.881**					
Organizational Factors	0.398	**0.974**				
Perceived Benefits	0.62	0.439	**0.898**			
Perceived Risks	-0.445	-0.345	-0.332	**0.926**		
Satisfaction_on_Decision	0.526	0.598	0.713	-0.558	**0.949**	
Technological Factors	0.446	0.544	0.58	-0.45	0.701	**0.924**

In table 4.2.2 – 13, The square root values of AVE are highlighted in bold fonts and represented diagonally. It can also be observed that the square root values are more significant than their corresponding latent variables values represented in rows and columns. Therefore, it can be inferred that there are no discriminant validity issues in the model. Perceived risks construct value is negative which means it doesn't have any influence in satisfaction of decision otherwise customer will not adopt cloud model.

Discriminant Validity: Heterotrait-Monotrait ratio of correlations (HTMT).

Henseler et al., (2015) have suggested an alternative to determining discriminant validity. The approach is based on the multitrait-multimethod matrix. A value less than 0.9 is adequate to infer that there exists a discriminant validity between two reflective constructs.

Table 4.2.2 – 14: Discriminant Validity (HTMT Criterion)

	Environmental Factors	Organizational Factors	Perceived Benefit	Perceived Risk	Satisfaction_on_Decision	Technological Factors
Environmental Factors						

Organizational Factors	**0.457**				
Perceived Benefits	0.68	**0.423**			
Perceived Risks	0.483	0.345	**0.316**		
Satisfaction_on_Decision	0.579	0.624	0.704	**0.562**	
Technological Factors	0.491	0.57	0.56	0.451	**0.724**

From table 4.2.2-14, it can be observed that the HTMT ratio for all constructs is less than 0.9. This means that discriminant validity has been established between the constructs.

Collinearity Statistics - Variance Inflation Factor (VIF)

Multi-collinearity exists when independent variables are inter-correlated. The measure which helps in determining the presence of multi-collinearity is the Variance inflation factor (VIF). A VIF score of less than 5.00 is adequate to consider that model has no multi-collinearity issues (Hair et al., 2017; Ramayah et al., 2018).

Table 4.2.2 – 15: Collinearity Statistics - Variance Inflation Factor (VIF)

	Environmental Factors	Organizational Factors	Perceived Benefit	Perceived Risk	Satisfaction_on_Decision	Technological Factors
Environmental Factors					1.836	
Organizational Factors					1.506	
Perceived Benefits					2.023	
Perceived Risks					1.398	
Satisfaction_on_Decision						
Technological Factors					1.925	

A multi-collinearity test is conducted, and the results are presented in table 4.2.2-15. It can be noted that VIF test values are less than 5.00 for all constructs. Therefore, the model doesn't have collinearity issues.

Evaluating Structural Model

Alternate Hypotheses H2a is tested using a structural model. The structural model is bootstrapped to find the parameters like Path coefficient, weights, and the predictive relevance of the structural model. Furthermore, the bootstrapping procedure is extended to create a confidence interval for the structural model and also a confidence interval with bias-corrected for the structural model.

Figure 4.2.2 – 2: SEM with the values of t tests obtained via the Bootstrapping module of SmartPLS

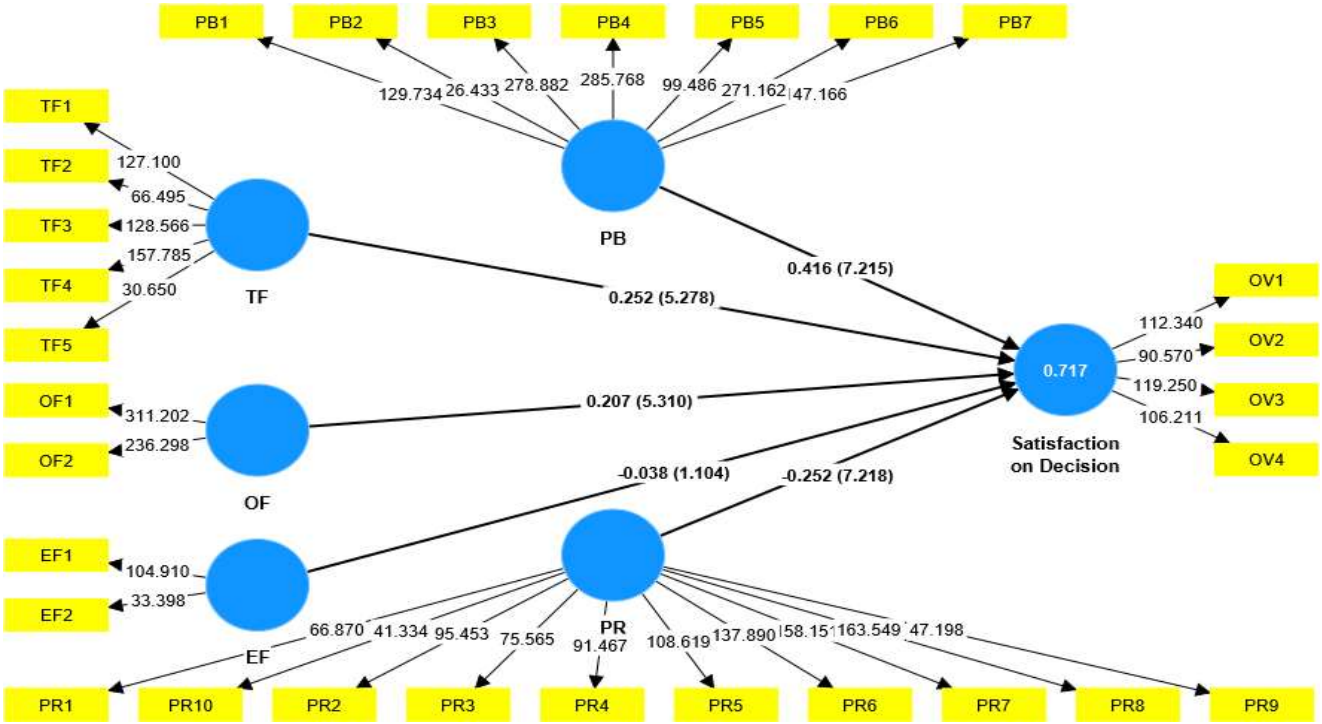


Figure 4.2.2-2 represents the bootstrapping of structural equation model t statistics values for different path coefficient values. It is to be noted that, Perceived risks construct value is negative

which means it doesn't have any influence in satisfaction of decision otherwise customer will not adopt cloud model. The corresponding path-coefficients values with their P-values are also presented in table 4.2.2-18.

Table 4.2.2 – 16: Evaluation of Structural Equation Model (Bootstrapping SEM) - Different paths with their T-Statistics

PATH	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Environmental Factors -> Decision	-0.038	-0.037	0.035	1.104	0.269
Organizational Factor -> Decision	0.207	0.205	0.039	5.31	0.000
Perceived Benefits -> Decision	0.416	0.414	0.058	7.215	0.000
Perceived Risk -> Decision	-0.252	-0.25	0.035	7.218	0.000
Technological Factor -> Decision	0.252	0.254	0.048	5.278	0.000

The results of t-statistics are obtained by bootstrapping 404 samples in PLS-SEM. The bootstrapping procedure is performed to derive sub-samples of 10,000 from the original samples. The results of the t-test results for accepting or rejecting the structural path are presented in table 4.2.2-16. The results presented in the table represent statistical significance for both the structural (inner) model and measurement (outer) model. The t-value is calculated at a 5% level of significance value, and it is above the critical value of 1.96 for all structural paths.

R-Square (Coefficient of determination)

Table 4.2.2 – 17: Evaluation of Structural Equation Model (Bootstrapping SEM) – R-Square

	R Square	R Square Adjusted
Satisfaction_on_Decision	0.717	0.714

Results of R- Square and R-Square Adjusted are presented in the above table 4.2.2-17. Chin (1998), in his book, described the contribution of all variables depending on the R-Square value obtained. If the R-Square value is greater than 0.67, then the contribution of the variable is

substantial. If the R-Square value is greater than 0.33, then the contribution of the variable is moderate. If the R-Square value is greater than 0.19, then the contribution of the variable is weak. The R-Square value obtained is 0.717, which is greater than the cut-off value of 0.67 for substantial contribution. This means 71.7% of variants can be explained by independent constructs of this study towards the dependent variable Decision. It can also be observed from table 4.2.2-17 that the R-Square Adjusted value of 0.714 is very close to the R-Square value of 0.717. This means the independent variables are having substantial contribution toward the dependent variable.

Cohen's F-Square (Size Effect)

Table 4.2.2 – 18: Evaluation of Structural Equation Model (Bootstrapping SEM) – Size Effect – F-Square

	Environmental Factors	Organizational Factors	Perceived Benefit	Perceived Risk	Satisfaction_on_Decision	Technological Factors
Environmental Factors					0.003	
Organizational Factors					0.101	
Perceived Benefits					0.302	
Perceived Risks					0.161	
Satisfaction_on_Decision						
Technological Factors					0.116	

The F-Square size effect expresses how large a proportion of variance is responsible for R-Square change (Hair et al., 2017). The f-Square size effect is determined in three sizes, and they are .02 represents a small f-square effect size, 0.15 represents a medium f-square effect size, and 0.35 represents a high f-square effect size (Cohen, 1988). The f-square size effect for all constructs is presented in table 4.2.2-18. It can be observed that the construct Technological factors have a medium impact on the decision with the approximate value of f-square = 0.116 ≈ 0.15. The factor Perceived Benefit has an f-square value = 0.302 ≈ 0.35 which is the high-size effect. Similarly, the environmental factor has an f-square value = 0.003 < 0.02, which means no side effect at all. The next construct is the organizational factor, and it has an f-square value = 0.101 ≈ 0.02, which is a

small size effect. Finally, Perceived Risk has an f-square value = 0.161 ≈ 0.15 which represents medium size effect.

Q-Square (Predictive Relevance)

Table 4.2.2 – 19: Evaluation of Structural Equation Model (Bootstrapping SEM) – Predictive Relevance – Q-Square

	Q^2 Predict	RMSE	MAE
Satisfaction on Decision	0.704	0.547	0.415

Q-Square (Predictive relevance or Predictive Accuracy) evaluates the cross-validated redundancy for a reflective modeled endogenous factor (GEISSER, 1974; Stone, 1974). Q-Square values are determined using the blindfolded algorithm for each endogenous factor in the model. Q-Square value greater than 0 is adequate to indicate that the model is relevant to predict the factor (Hair et al., 2017). Q-Square value is presented in Table 4.2.2-19. It can be observed that Q-Square = 0.704 > 0, which satisfies the condition. Therefore, the build model has predictive relevance.

4.3 Qualitative Data Analysis

Qualitative data analysis with respect to stakeholders like the economic buyer, technical buyer, and end-user is narrowed down to Organizations that adopted the cloud computing model and are re-adopting the on-premise model again.

4.3.1 Data Collection

Sample Size

In Qualitative research, there are several discussions in determining the sample size. Most of the researchers agree with the concept of saturation. Mason (2010) has argued that saturation is the most important factor for determining the sample size in qualitative research. Saturation is defined as the point at which the data collection process will not contribute any new findings or relevant data. Charmaz (2006) has defined saturation as "when gathering fresh data no longer sparks new theoretical insights, nor reveals new properties of your core theoretical categories."

Dworkin (2012) has stated that "An extremely large number of articles, book chapters, and books recommend guidance and suggest anywhere from 5 to 50 participants as adequate". Shetty (2018) argued that the general recommendation for sample size in qualitative research is 20 to 30. Charmaz (2006); Morse (1994, 1995) has stated that, in some studies, a minimum of 10 is acceptable, and these sample sizes are adequate because of the following criteria.

i) These sample sizes will allow a thorough examination of the characteristics that address the research questions and distinguish conceptual categories of interest.
ii) These sample sizes maximize the possibility that enough data have been collected to clarify relationships between conceptual categories and identify variations in processes.
iii) These sample sizes maximize the chances that negative cases and hypothetical negative cases have been explored in the data.

Case selection

INDIA is a growing economy and has a large presence of different types of industries with ICT tools and infrastructure enabled. All case organizations in our research study are multinational and national organizations operating in INDIA. Based on our pilot study findings, Researcher has identified the case companies who are using Software-As-A-Service applications and Infrastructure-As-A-Service. Data was collected from different types of organizations over a period starting from July 2018 to the end of July 2020. At the start of each interview session, there is a formal introduction of the interviewer, participant, and the purpose of the interview. The interviewer then explained the definitions of factors resulting from the integrated research model and asked the participant about the influence of each variable in their organization's decision. The interviewer assured participants that all information would be treated with confidentially. With the request from participants, the organization names are not mentioned in the research study. The organizations are represented as O1 – O20. The Audio-Visual recordings of interviews are recorded using ICT tools Cisco Webex and Zoom.

Table 4.3.1-1: Overview of Organizations

	Organizational Characteristics					Respondent Characteristics	
#	Industry Type	Employees	IT Staff	Total Assets (Dollars)	Re-adoption status	Position	Education
O1	Banking	97,535	2710	1.72 Trillion	Re-adopted	Assistant Vice President	IT
O2	Banking	85,000	2360	2.374 Trillion	Re-adopted	IT Staff	IT
O3	Financial	10,000	300	3.15 Billion	Re-adopted	Manager	IT
O4	Education	1,200	50	10 Million	No	IT Staff	IT
O5	Pharmaceutical	1,26,000	2,500	133 Billion	No	IT Staff	IT
O6	Transportation	12,000	400	15.3 Billion	Re-adopted	Manager	IT
O7	IT	380,300	2,50,000	125.35 Billion	Re-adopted	Sr. Manager	IT
O8	IT	49,000	40,000	70 Billion	Re-adopted	Director	IT
O9	IT	4500	3500	1 Billion	No	IT Staff	IT
O10	IT	1,60,000	90,000	11.68 Billion	Re-adopted	IT Staff	IT
O11	IT	8,071	6,000	5,482 Million	No	IT Staff	IT
O12	IT	120	100	20 Million	No	Manager	IT
O13	IT	1,24,000	80,000	241 Billion	No	IT Staff	IT
O14	IT	500	350	500 Million	No	IT Staff	IT
O15	IT	450	300	200 Million	No	IT Staff	IT
O16	IT	4,712	3,000	5 Billion	No	IT Staff	IT
O17	IT	1,200	1,000	1 Billion	No	Director	IT
O18	IT	1,200	1,000	1 Billion	No	Sr. Manager	IT
O19	IT	1,100	1,000	1 Billion	No	IT Staff	IT
O20	On-line shopping	5,66,000	28,385	131 Billion	No	Sr. Manager	IT

In total researcher has invited 30 companies. Out of 30 invited companies, 20 have given their consent and participated in the focus group discussion and interviews. The overview of different types of case organizations that have participated in our research study is represented in Table 4.3.1-1. These organizations are belonging to different types of industries. Thirteen of these case organizations are information technology organizations and are listed from O7 to O20. These are multi-national and national organizations located in various parts of India. The other cases were two from banks, pharmaceutical institutions, financial Institutions, and online shopping organizations in India.

4.3.2. Data Analysis and Findings

The data analysis is done in multiple iterations, namely within-case analysis, qualitative comparative analysis, and cross-case analysis. For within-case analysis, the researcher has examined each individual case separately with the help of the integrated research model's factors and outcome variable adopted, not-adopted. Field notes are used to refine the findings in individual case analyses. With this approach, several influencing factors are found for adopting the enterprise software product deployment model. Qualitative comparative analysis has been used in an informal way for processing the outcome of within-case analyses. Bentrop (2013) has described qualitative comparative analysis as a process to discover the group of conditions used in describing a specific outcome. Rihoux & Ragin (2008) has described that qualitative comparative analysis must be used for within-case analysis and cross-case analysis of data. Still, all these cases must be translated into configurations in order to compare them. These configurations are various factors in our research study. The findings are concluded with an across-case analysis section. Qualitative comparative analysis results form the basis to discover the configurations that lead to the adoption of enterprise software product deployment model. The across-case analysis is used to discover identical patterns among different case organizations, which helped conclude the influence of various factors in our study. The researcher used Nvivo software for analyzing the data. This is in line with (Richards & Bazeley, 2000) "The Nvivo Qualitative Project Book" and also used the quotes given by the interviewees to show the findings of the study.

Data Validity

Yin (2014) has defined that there are four types of data validation such as reliability, External validation, Internal validation, and construct validation which reveals the quality of the research. Construct validation provides correct measures to be used for a research study. The sources of construct validation used in this research study are as follows:

(i) Group discussions, documentation, interviews, and notes

(ii) Building continuous evidence during interviews and

(iii) Summarization of results of individual cases for feedback.

Internal validation defines and evaluates the relationships discovered in the research study (Robert, 2014). The researcher has used an explanation-building procedure in the study that strengthens the internal validation of data. The generalization of findings is known as external validation (Robert, 2014). The researcher has used the replication logic of multiple case designs to strengthen the generalization of findings in our research study. In the last, the reliability of the research is ensured using the database for each case study. This guarantees that the analysis and data collection can be repeated (Robert, 2014).

4.3.2.1 Economic Buyer Analysis

The factors from the integrated research model that influences the organization's decision to re-adopt the on-premise model of a software product from the cloud computing model are Bill surprise, Monitoring the unused hosts, Exit Charges, Licensing of OS and application, Provider Data pull-out charges, Top management support, Size of the company or its IT unit, Relative advantage and the outcome variable re-adopted/not-readopted. All the mentioned factors are specifically related to the context of cost.

For analyzing the data, eight codes are used to organize it: Bill surprise (C1), Monitoring the unused hosts (C2), Early termination Charges (C3), Licensing of OS and application(C4), Provider Data pull-out charges (C5), Top management support (C6), Size of the company or its IT unit (C7), Relative advantage (C8). Table 4.3.2.1-1 describes the scheme used for coding with code descriptions and examples of real text.

Table 4.3.2.1-1: Coding scheme

Code	Description
Bill surprise (C1)	Comprises of responses from participant about the reasons on hike in the Bills of cloud service usage.
Monitoring the unused hosts (C2)	Comprises of responses from participant about the cost that will incur due to not monitoring the hosts which are lying idle.
Early termination Charges (C3)	Comprises of responses from participant about termination charges to be paid to cloud service provider in case of service termination.

Licensing of OS and application(C4)	Comprises of responses from participant about the licensing of OS and application in cloud and On-premise model.
Provider Data pull out charges (C5)	Comprises of responses from participant about amount charged by the cloud service provider for downloading data stored in cloud servers.
Top management support (C6)	Comprises of responses from participant about top management support in terms of costs.
Size of the company or its IT unit (C7)	Comprises of responses from participant about the cost that will incur due to the size of IT unit.
Relative advantage (C8)	Comprises of responses from participant about the reasons of relative advantages between two deployment models in terms of cost.

Source: Researcher own compilation

Within-case analysis

The researcher has examined each individual case based on eight variables "Bill surprise", "Monitoring the unused hosts", "Exit Charges", "Licensing of OS and application", "Provider Data pull-out charges", "Top management support", "Size of the company or its IT unit", "Relative advantage" and also the outcome variables re-adopted/not-readopted.

The evaluation of these eight variables happened in two parts: first, the researcher assigned a measurable value to the variable and then acquired the value from either interview or group discussion. For the variable "bill surprise", the researcher presents the analysis using case O6, the respondent, in this case, states that "we directly adopted cloud solution for mobile device management software product due to its initial offerings, but the actual rate was not inline with the forecasted amount. So, we re-adopted back to on-premise servers". For the variable "monitoring unused hosts," we have used findings from our case organization O3, the respondent stated that "we have two environments in the cloud, namely test or user acceptance environment and production environment. We first test the upgrade of software releases in the test or user acceptance environment, then upgrade the production environment to ensure there is no downtime due to bugs in the application. But, with this approach, we don't monitor the unused test or user acceptance environment, which are idle, and yields in cost". For the variable, "early termination/exit charges", the researcher presents the findings from case organization O8, the respondent states that "We

signed up for three years contract for the same amount of billing. Still, we got charged for terminating the contract before its completion".

The "Licensing of OS and application" variable is another concern when organizations are moving from cloud to on-premise, for this variable researcher presents the findings with the help of case organization O10. The respondent says, "The cost is not the same for licenses of OS and applications in cloud and on-premise servers, The initial cost during re-adopting on-premise solution has influenced the decision, but considering the long term returns, we re-adopted to on-premise infrastructure". For the variable "Data Pull out charges", the respondent case organization O7 states that "We have been using cloud from past five years and had a huge amount of data in cloud servers, the vendor had charged for downloading the data when we were re-adopting back to On-premise servers". For the variable "Top management support", The respondent O10 states that "Top management support plays an important role in the decision making". Top management support in terms of cost and finances plays an important role in the re-adopting on-premise infrastructure. For the variable "Size of the company or its IT unit", the researcher presents the findings from case organization O7. They state that, the "Size of the organization determines the re-adopting decision to on-premise infrastructure from SaaS-based cloud products. The chance of re-adoption is more for larger organizations than SMEs". For the variable "Relative advantage" which is calculated in terms of cost by considering the cost of computing resources. Respondent O10 states that, "they re-adopted back to on-premise infrastructure for mobile device management software from SaaS-based cloud service model due to cost advantage".

Qualitative comparative analysis

This section includes the classification of case organizations according to variables resulting from the integrated research model and with respect to the economic buyer: Bill surprise (C1), Monitoring the unused hosts (C2), Early termination Charges (C3), Licensing of OS and application(C4), Provider Data pull out charges (C5), Top management support (C6), Size of the company or its IT unit (C7), Relative advantage (C8). (Rihoux B & Ragin C, 2008), has explained the approach for qualitative comparative analysis, and this forms the base to illustrate our findings.

All variables have been assigned a value of either 0 or 1, illustrating that the given outcome or condition is present if the value is 1 otherwise 0. Table 4.3.2.1-2 illustrates the assignment of

values to all variables.

Table 4.3.2.1-2: Database set of cases for factors

Organization	C1	C2	C3	C4	C5	C6	C7	C8	Re-Adoption
O1	1	1	0	0	1	1	1	1	1
O2	1	1	0	0	1	1	1	1	1
O3	1	0	0	0	1	1	0	1	1
O4	0	0	0	0	1	0	0	0	0
O5	0	0	0	0	1	0	0	0	0
O6	1	0	0	0	1	1	0	1	1
O7	1	0	0	0	1	1	0	1	1
08	1	1	0	0	0	1	1	1	1
O9	0	0	0	1	0	0	0	0	0
O10	1	1	1	1	0	0	0	1	1
O11	0	1	0	0	0	0	0	0	0
O12	0	1	0	0	0	0	0	0	0
O13	0	1	0	0	0	0	0	0	0
O14	0	0	0	1	0	0	0	0	0
O15	0	0	0	1	0	0	0	0	0
O16	0	0	0	1	0	0	0	0	0
O17	0	0	0	0	0	0	0	0	0
O18	0	0	0	0	0	0	0	0	0
O19	0	0	0	0	0	0	0	0	0
O20	0	0	0	0	0	0	0	0	0

The database set of all case organizations for the variables derived from the integrated model is represented in Table 4.3.2.1-2. These database sets also represent our findings. A truth table, "Table 4.3.2.1-3," is derived from Table 4.3.2.1-2, which summarizes all configurations of all eleven conditions which has influenced the organization's decision to re-adopt the on-premise model from the cloud computing model of the software product.

Table 4.3.2.1-3: Truth Table

Configuration	C1	C2	C3	C4	C5	C6	C7	C8	Re-Adopt	Not Re-Adopt
A: 11001111	1	1	0	0	1	1	1	1	2	
B: 10001101	1	0	0	0	1	1	0	1	3	
C: 11000111	1	1	0	0	0	1	1	1	1	
D: 11110001	1	1	1	1	0	0	0	1	1	
E: 00000000	0	0	0	0	0	0	0	0		4
F: 00001000	0	0	0	0	1	0	0	0		2

G: 01000000	0	1	0	0	0	0	0	0	3
H: 00010000	0	0	0	1	0	0	0	0	4

Table 4.3.2.1-3 displays all possible configuration combinations. All of these configurations are found in our case organization database set. It is worth noting that configurations A, B, C, and D are leading to the re-adoption of the on-premise model, whereas configurations E, F, G, and H are not leading to re-adoption.

Across-case analysis

In this section, the researcher presents the identical patterns between all case organizations. This has helped us in examining the re-adoption decision of organizations towards the on-premise model.

Bill surprise

Seven of our case organizations were influenced by this factor. All the case organizations O1, O2, O3, O6, O7, O8, and O10 organizations, irrespective of their industry type, are influenced by this reason and re-adopted back to the on-premise software model from the cloud service deployment model. “Bill surprise generally happens because the initial promotional offerings attracted the organizations in, but after some time, the billings ends up being significantly greater than predicted”. The case organization (O6) is a leading transportation organization, and they were highly influenced due to this reason which resulted in re-adoption.

Monitoring unused hosts

Seven of our case organizations were influenced by this factor. The case organizations O1, O2, O8, and O10, irrespective of their industry type, are influenced by this reason and re-adopted back to the on-premise software model from the cloud service deployment model. In contrast, the organizations O11, O12, and O13 remained with the cloud deployment model of the software product.

Exit/Termination Charges

This variable has an influence on only one case organization selected in this study. The organization's O10 re-adopted back to the on-premise software model from the cloud service deployment model software product.

Licensing of OS and application

This variable has an influence on five case organizations selected in this study. The case organization, O10, irrespective of their industry type, is influenced by this reason and re-adopted back to the on-premise software model from the cloud service deployment model. In contrast, the organizations O9, O14, O15, and O16 remained with the cloud deployment model of the software product.

Provider Data pull-out charges

Seven of our case organizations were influenced by this factor. The case organizations O1, O2, O3, O6, and O7, irrespective of their industry type, are influenced by this reason and re-adopted back to the on-premise software model from the cloud service deployment model. In contrast, the organizations O4 and O5 remained with the cloud deployment model of the software product.

Top management support

Six of our case organizations were influenced by this factor. All the case organizations O1, O2, O3, O6, O7, and O8, irrespective of their industry type, are influenced by this reason and re-adopted back to the on-premise software model from the cloud service deployment model of the software product.

Size of the company or its IT unit

Three of our case organizations were influenced by this factor. All the case organizations O1, O2, and O8, irrespective of their industry type, are influenced by this reason and re-adopted back to the on-premise software model from the cloud service deployment model of the software product.

Relative advantage

This variable influences seven case organizations selected in this study. The organizations O1, O2, O3, O6, O7, O8, and O10, irrespective of their industry type, are influenced by this reason and re-adopted back to the on-premise software model from the cloud service deployment model of the software product.

4.3.2.2 Technical Buyer and End user Analysis.

The factors from the integrated research model that influences the organization's decision to re-adopted on-premise model of the software product from the cloud computing model of the software product are "Performance", "Local data retention laws", "Risk mitigation strategies", "Monitoring the unused hosts", "Awareness level of IT team", "Availability of the required organizational resources", "Compatibility", "Complexity" and the outcome variable re-adopt/not-readopt. All the mentioned factors are specifically related to the context of the Technical Buyer and end-user.

For analyzing the data, eight codes are used to organize it: Performance (C1), Local data retention laws (C2), Risk mitigation strategies (C3), Monitoring the unused hosts (C4), Awareness level of IT team(C5), Availability of the required organizational resources (C6), Compatibility (C7), Complexity (C8). Table 4.3.2.2-1 describes the scheme used for coding with code descriptions and examples of real text.

Table 4.3.2.2-1: Coding scheme

Code	Description
Performance (C1)	Comprises of responses from participants about the reasons of Performance of application between two deployment models in terms of technical aspects.
Local data retention laws (C2)	Comprises of responses from participants about data retention laws from the local governing bodies.
Risk mitigation strategies (C3)	Comprises of responses from participants about risk mitigation strategies in case of Hacking Attacks/Service breakdown/Vulnerabilities.
Monitoring the unused hosts (C4)	Comprises of responses from participants about Idle hosts in development and test environment.
Awareness level of IT team (C5)	Comprises of responses from participants for observing the results of innovation.

Availability of the required organizational resources (C6)	Comprises of responses from participants about availability of required technical resources to handle re-adopting activity.
Compatibility (C7)	Comprises of responses from participant about the technical compatibility with existing infrastructure.
Complexity (C8)	Comprises of responses from participants about ease of use in both deployment models of software product.

Within-case analysis

The researcher has examined each individual case based on eight variables Performance, Local data retention laws, Risk mitigation strategies, Monitoring the unused hosts, Awareness level of IT team, Availability of the required organizational resources, Compatibility, Complexity, and also the outcome variables re-adopt or not-readopt.

The evaluation of these eight variables happened in two parts: first, the researcher assigned a measurable value to the variable and then acquired the value from either interview or group discussion. For example, for a given configuration of computing resources, the performance of a mobile device management application is assigned as a number of requests per second and then acquired its value from the participants during interviews. For example, the factor "relative advantage" in terms of performance is calculated by considering the configuration of computing resources, the performance of the application is assigned a number of user requests per second and then acquired its value from the participants during interviews. For respondent O8, "The number of user's requests for the on-premise server is more than the cloud for the same amount of computing resources". For the variable "local data retention laws", the researcher presents the analysis from O1. The informant, in this case, states that "we re-adopted on-premise servers for data storage, still maintaining the mobile device management application server in the cloud. This gives a hybrid solution and solves the business dependencies with federal customers".

For the variable "risk mitigation strategy", the researcher presents the findings from the analysis of case O10. The respondent, in this case, states that "we re-adopted back to on-premise servers because of our corporate risk mitigation strategy. Brute force attacks cannot be handled in a cloud environment for office 365 accounts, and this overloads the authentication server". Similarly, for the variable "monitoring unused hosts," we have used findings from our case organization O10,

the respondent stated that "we have two environments in the cloud namely test or user acceptance environment and production environment. We first test the upgrade of software releases in the test or user acceptance environment, then upgrade the production environment to ensure there is no downtime due to bugs in the application. But, with this approach, we don't monitor the unused test or user acceptance environment which are idle". For The variable "Awareness level of IT team", the researcher presents the findings from respondent O6. The respondent states that "The technical awareness of the IT team helps in the re-adopting activity. The more technical the IT team is, the quicker the re-adoption activity and it helps in reducing costs as well".

The variable "Availability of the required organizational resources" means organizational readiness in terms of technical resources from a technical buyer perspective, and the researcher presents the findings from respondent O7. The participant states that "Organizational readiness also plays an important role in the re-adoption process. The technical skills of the IT Team and technical resources ease in re-adoption back to on-premise systems from cloud systems". For the variable "compatibility", the researcher presents the analysis from O2. The informant, in this case, states that "we re-adopted back to on-premise servers from the cloud. The on-premise authentication server "Microsoft Active Directory" system is already compatible with user authentication service and is supported by vendors. Authentication servers always play an important role and are enablers for re-adopting activities". For the variable "complexity", the researcher presents the analysis using case O3, the respondent, in this case, states that "we directly adopted cloud solution and re-adopted back to the on-premise server. The complexity in deploying on-premise solutions is more than cloud solutions, but the end user's ease of use and experience is very good".

Qualitative comparative analysis

This section includes the classification of case organizations according to variables resulting from the integrated research model and with respect to technical buyer: Relative Performance (C1), Local data retention laws (C2), Risk mitigation strategies (C3), Monitoring the unused hosts (C4), Awareness level of IT team(C5), Availability of the required organizational resources (C6), Compatibility (C7), Complexity (C8) and the outcome variable Re-adoption. (Rihoux B & Ragin C C, 2008), has explained the approach for qualitative comparative analysis, and this forms the

base to illustrate our findings.

All variables have been assigned a value of either 0 or 1, illustrating that the given outcome or condition is present if the value is 1 otherwise 0. Table 4.3.2.2-2 illustrates the assignment of values to all variables.

Table 4.3.2.2-2: Database set of cases for factors

Organization	C1	C2	C3	C4	C5	C6	C7	C8	Re-Adoption
O1	1	1	1	0	0	1	1	1	1
O2	1	1	1	0	0	1	1	1	1
O3	1	1	1	1	1	1	1	1	1
O4	1	1	0	0	1	1	0	0	0
O5	1	1	0	0	1	1	0	0	0
O6	1	1	1	1	1	1	1	1	1
O7	1	1	1	1	1	1	1	1	1
08	1	1	1	0	0	1	0	1	1
O9	1	1	0	1	1	0	0	0	0
O10	1	1	1	1	1	0	0	1	1
O11	1	1	0	0	0	0	0	0	0
O12	1	1	0	0	0	0	0	0	0
O13	1	1	0	0	0	0	0	0	0
O14	1	1	0	1	1	0	0	0	0
O15	1	1	0	1	1	0	0	0	0
O16	1	1	0	1	1	0	0	0	0
O17	1	1	0	0	1	0	0	0	0
O18	1	1	0	0	1	0	0	0	0
O19	1	1	0	0	1	0	0	0	0
O20	1	1	0	0	1	0	0	0	0

The database set of all case organizations for the variables derived from the integrated model is represented in Table 4.3.2.2-2. These database sets also represent our findings. A truth table, "Table 4.3.2.2-3," is derived from Table 4.3.2.2-2, which summarizes all configurations of all eight conditions which has influenced the organization's decision to re-adopt the on-premise model of the software product from the cloud computing deployment model.

Table 4.3.2.2-3: Truth Table

Configuration	C1	C2	C3	C4	C5	C6	C7	C8	Adopt	Not-ReAdopt
A: 11001000	1	1	0	0	1	0	0	0		4
B: 11001100	1	1	0	0	1	1	0	0		2
C: 11000000	1	1	0	0	0	0	0	0		3
D: 11011000	1	1	0	1	1	0	0	0		4
E: 11100111	1	1	1	0	0	1	1	1	2	
F: 11111111	1	1	1	1	1	1	1	1	3	
G: 11100101	1	1	1	0	0	1	0	1	1	
H: 11111001	1	1	1	1	1	0	0	1	1	

Table 4.3.2.2-3 displays all possible configuration combinations. All of these configurations are found in our case organization database set. It is worth noting that configurations E, F, G, and H are leading to re-adoption, whereas configurations A, B, C, and D are not leading to re-adoption.

Across-case analysis

In this section, the researcher presents the identical patterns between all case organizations. This has helped us in examining the re-adoption decision of organizations back to the on-premise model from the cloud computing model.

Performance

This variable has influenced all organizations selected as cases in this study. The organizations O1, O2, O3, O6, O7, O8, and O10 have re-adopted to an on-premise model of deployment for the enterprise software product. All the above-mentioned case organizations, irrespective of their industry type, are influenced by this reason and re-adopted to the on-premise deployment model of a software product where as case organizations O4, O5, O9, O11 – O20 remained with the cloud service model.

Local data retention laws

This variable has influenced all organizations selected as cases in this study. The organizations O1, O2, O3, O6, O7, O8, and O10 have re-adopted to an on-premise model of deployment for the enterprise software product. All the above-mentioned case organizations, irrespective of their industry type, are influenced by this reason and re-adopted to the on-premise deployment model

of a software product where as case organizations O4, O5, O9, O11 – O20 remained with the cloud service model.

Risk mitigation strategies

This variable has influenced seven organizations selected as cases in this study. The organizations O1, O2, O3, O6, O7, O8, and O10 have re-adopted to an on-premise model of deployment for the enterprise software product. All the above-mentioned case organizations, irrespective of their industry type, are influenced by this reason and re-adopted the on-premise deployment model of the software product.

Monitoring the unused hosts

This variable has influenced eight organizations selected as cases in this study. The organizations O3, O6, O7, and O10 have re-adopted to an on-premise model of deployment for the enterprise software product. All the above-mentioned case organizations, irrespective of their industry type, are influenced by this reason and re-adopted the on-premise deployment model of a software product, whereas case organizations O9, O14, O15, and O16 remained with the cloud service model.

Awareness level of IT team

This variable has influenced fourteen organizations selected as cases in this study. The organizations O3, O6, O7, and O10 have re-adopted to an on-premise model of deployment for the enterprise software product. All the above-mentioned case organizations, irrespective of their industry type, are influenced by this reason and re-adopted the on-premise deployment model of a software product where as case organizations O4, O5, O9, O14 - O20 remained with the cloud service model.

Availability of the required organizational resources

This variable has influenced eight organizations selected as cases in this study. The organizations O1, O2, O3, O6, O7, and O8 have re-adopted to an on-premise model of deployment for the enterprise software product. All the above-mentioned case organizations, irrespective of their industry type, are influenced by this reason and re-adopted the on-premise deployment model of a software product, whereas case organizations O4 and O5 remained with the cloud service model.

Compatibility

This variable has influenced five organizations selected as cases in this study. The organizations O1, O2, O3, O6, and O7 have re-adopted the on-premise model of deployment for the enterprise software product. All the above-mentioned case organizations, irrespective of their industry type, are influenced by this reason and re-adopted the on-premise deployment model of the software product.

Complexity

This variable has influenced seven organizations selected as cases in this study. The organizations O1, O2, O3, O6, O7, O8, and O10 have re-adopted to an on-premise model of deployment for the enterprise software product. All the above-mentioned case organizations, irrespective of their industry type, are influenced by this reason and re-adopted the on-premise deployment model of the software product.

4.4 Summary

In this chapter, the researcher presented the findings from analysis of qualitative and quantitative data collected from multi-national organizations in INDIAN cities like Bengaluru, Hyderabad, Pune, and Chennai. The data is collected from different types of industries like Banking, Pharmaceuticals, E-Commerce, and IT-Industry. The researcher has presented the findings of qualitative data for organizations re-adopting back to the on-premise model from the cloud service model. For Quantitative data, the researcher has presented the findings for the scope "organizations adopting cloud deployment model from an on-premise model of software product". The qualitative data is collected using interviews and focused group discussions, and the audio-visual recording is saved using meeting collaboration tools like Cisco Webex and Zoom.

In total, 30 respondents participated, but the researcher incorporated the responses of 20 participants only due to data uniformity issues. The quantitative data is collected using a survey questionnaire. The data was collected using tools like survey monkey and emailing services. In total, 404 organizations participated in the research study. The secondary data was collected from analysts like Gartner, Asia Cloud Computing Association, SMEs in Asia Pacific, and online research reports like Cloud Adoption Statistics for 2021, SMB Cloud Insights, and more. The

qualitative data is analyzed using Nvivo software. The quantitative data is analyzed using SPSS and SmartPLS software. The findings from qualitative and quantitative data analysis are discussed in detail in the next chapter.

CHAPTER – V

RESULTS, DISCUSSIONS & CONCLUSIONS

Chapter - V

RESULT, DISCUSSIONS & CONCLUSIONS

5.1. Overview

In the previous chapter, the researcher discussed data collection techniques, case organizations selected for qualitative data analysis, and data validity. The researcher has also discussed the findings and results of this research study in both qualitative and quantitative data analysis sections. The findings are concluded with a detailed examination of each construct influencing the organizations to choose either an on-premise or cloud computing model for the software product. In this chapter, a summary of the research study and its implications are presented. Finally, the chapter is concluded with the limitation and direction for future research.

5.2. Summary of research findings

In this research study, the mixed methodology is used for determining the adoption/re-adoption behavior of organizations towards the deployment model of enterprise software products. Therefore, the researcher presents the summary of research findings for both quantitative data and qualitative data.

5.2.1 Summary of research findings for Quantitative Data Analysis

For Quantitative Data Analysis, the scope of this research study with respect to stakeholders like an economic buyer, technical buyers, and end-user is narrowed down to the scope "Organizations which already have an on-premise model of software product wants to adopt cloud computing model".

Respondent profiles for quantitative data

The respondents are from different levels of organizations like Vice presidents, Program Managers, IT-Director, IT-Managers, and IT-Admin team. The summary of research findings for qualitative data analysis is as follows:

Summary of Data Analysis for Economic Buyer:

An exploratory factor analysis test is conducted to find whether the variables considered are relevant to the study or not. The results from the test show that the KMO test score (KMO=0.804) is more than the recommended value. The result from Bartlett's test of sphericity ($\chi 2 = 3485.156$, $p < 0.001$) not only signifies but also confirms that the sample is adequate for gathering the economic buyer's viewpoint. The total variance value is 85.449 which signifies that the factors are accountable for the organizations which already have the on-premise model of software products adopting the cloud computing model. Descriptive statistics results on the construct organizational factors show "Top Management Support" ($M = 4.62$, $S.D = 0.561$) is having highest mean score followed by the item "Availability of the required organizational resources" ($M = 4.43$, $S.D = 0.852$). Organizations should have adequate support from top management to support the cost of adoption activity. Organizations should also have readiness in terms of financial resources to meet the expenditure during adoption activity.

Descriptive statistics results for the construct Perceived Benefit factors highlight the maximum mean score for the item "Pay only for what you use" ($M = 4.21$, $S.D = 1.040$) followed by the item "Requires less in-house IT staff, costs" ($M = 3.99$, $S.D = 1.361$). Organizations adopt the cloud computing model when they see benefits and advantages in the cloud service model when compared to on-premise mode. Descriptive statistics results for the construct Perceived Risks factors highlight the maximum mean score for item "Autoscaling of computational resources" ($M = 3.52$, $S.D = 0.792$). Organizations should note that as the load increases on the application in the cloud environment, the cloud services auto-scale the computing resources to support the load running on it. This may increase the costs and can have a negative influence on adoption decisions. Descriptive statistics results for the common construct of Technological and Environmental factors highlight the maximum mean score for the item "Relative Advantage" ($M=3.81$, $S.D = 1.15$). The result of correlation indicates that all constructs of Technological Factors, Organizational Factors, Environmental Factors, Perceived Benefit factors, Perceived Risks factors, and outcome variable Satisfaction_on_Decision are statistically significant with positive relationships among them. While looking at the magnitude of relationships, it can be observed that the outcome variable " Satisfaction_on_Decision " is having a highest positive relationship with the construct

Organizational Factors. This means that organizations tend to adopt cloud services quickly if they have top management support and readiness in terms of financial resources.

It can also be observed that the decision variable is having a positive relationship with constructs "Perceived Benefits and Technological Factor". Organizations adopt cloud services when they see more advantages and benefits in the cloud than in on-premise deployment models. Results of correlation also indicate that the constructs "Perceived Risk and Environmental Factor" is having a relationship with "Perceived Benefits and Technological Factor", and they are positively correlated. Organizations will adopt when they see less risk and more benefits in the cloud model than the on-premise model. The significance value for each construct is less than the tolerance value of 0.05 which means the results of the research study are 95% confidence. Therefore, the researcher rejects the null hypothesis and accepts an alternate hypothesis.

The results of bootstrapping Structural Equation Modelling through SMART- PLS software indicates that the path coefficient of all constructs directed towards "Satisfaction_on_Decision" is valid based on the critical t-value. The p-values obtained for the constructs Organizational Factors, Perceived Benefit, Perceived Risks, Technological and Environmental Factors at a 5% level of significance are P=0.000, P=0.000, P=0.164, and P=0.005 respectively. This means that the constructs are having a strong level of influence on the decision variable except for the construct's perceived risks. The Q-square value is greater than zero which means that the build model has predictive relevance.

Summary of Data Analysis for Technical Buyer & End-User:

An exploratory factor analysis test is conducted to find whether the variables considered are relevant to the study or not. The result from the test shows that the KMO test score (KMO=0.914) is more than the recommended value. The result from Bartlett's test of sphericity ($\chi 2 = 18603.614$, $p < 0.001$) not only signifies but also confirms that the sample is adequate for gathering the economic buyer's viewpoint. The total variance value is 88.661 which signifies that the factors are accountable for the organizations which already have an on-premise model of software products adopting the cloud computing model. Descriptive statistics results for the construct technological factors show "Trialability" ($M = 4.69$, $S.D = 0.579$) is having the highest score. The next highest score is from the item "Complexity" (M=4.68, $S.D = 0.572$) followed by the item "Observability"

(*M* = 4.62, *S.D* = 0.588) and then followed by the item "Relative advantage" (*M* = 4.36, *S.D* = 0.904). Organizations can have the trial period for cloud services model to observe whether the cloud services are matching the goal of the organization or not. The bigger the trial period is, the more results can be observed. This is the reason why the cloud services vendors offer 6 monthly trial period for their cloud solutions. Based on the results from the trial period, organizations can conclude the relative advantage between the two deployment models.

Descriptive statistics results for the construct organizational factors shows "Top Management Support" (*M* = 4.10, *S.D* = 1.117) is having highest mean score. Organizations should have top management skilled in cloud technology. The more the managers are technically skilled with cloud technologies the more is the adoption rate of the cloud services model. Descriptive statistic results for the construct environmental factors show "Government support" (*M* = 4.24, *S.D* = 1.055) is having the highest score. Government regulations for the usage of technology outside its territory have stopped organizations from adopting cloud technologies. Descriptive statistics results for the construct perceived benefit factors shows that "Virtualization vulnerability" (*M* = 3.78, *S.D* = 0.650) is having the highest score. The next highest score can be observed from the item "Identity Management" (*M* = 3.76 and *S.D* = 0.671) followed by the item "Data backup" (*M* = 3.57 and *S.D* = 0.982). The next highest score is reported by the item "Data integrity" (*M* = 3.39 and *S.D* = 1.183) and then by the item "Data Privacy" (*M* = 3.18, *S.D* = 0.927) followed by the item "Application Sensitivity" (*M* = 3.07, *S.D* = 0.757). Organizations care for the data and identities of their users. If the software on which the cloud virtual machines are built is vulnerable, then organizations will not adopt the cloud services model. Penetration test results will show if the virtualization software is vulnerable to attacks or not. Descriptive statistics results for the construct perceived risks factors show that "Network and web application security" (*M* = 3.26, *S.D* = 0.610) is having the highest score. The next highest score can be observed from the item "Data security" (*M* = 3.25 and *S.D* = 0.634). Organizations should design their network in cloud infrastructure by following strict guidelines and standards. The ports in the firewall should be open only for legitimate networks. This is the first level of defense toward securing the data and software applications in the cloud environment.

The result of correlation indicates that all constructs of Technological Factors, Organizational Factors, Environmental Factors, Perceived Benefit factors, and outcome variable Satisfaction_on_Decision are statistically significant with positive relationships among them. The only construct which is a negative relationship is Perceived Risks factors. While looking at the magnitude of relationships, it can be observed that the outcome variable "Satisfaction_on_Decision" is having the highest positive relationship with the construct Technological Factors. This means that organizations tend to adopt cloud services quickly if their technical goals meet with the cloud deployment model.

The output of the F ratio is 188.001 and the associated p-value is 0.000 which is less than 0.05. This signifies that the major constructs of the integrated research model Technological factors, Organizational factors, Environmental Factors, Perceived Benefit, and Perceived Risks influence the outcome or dependent variable Satisfaction_on_Decision to cloud computing model from the On-Premise model of the software product. The results of the coefficient show that all constructs of Technological, Organizational, Environmental, Perceived Benefit, and Perceived Risks factors influence the output variable Satisfaction_on_Decision which leads to the adoption of Cloud Computing from the On-Premise model of the software product. The significance value for each construct is less than the tolerance value of 0.05 which means the results of the research study are 95% confidence. Therefore, the researcher rejects the null hypothesis and accepts the alternate hypothesis.

The results of bootstrapping Structural Equation Modelling through SMART- PLS software indicates that the path coefficient of all constructs directed towards "Satisfaction_on_Decision" is valid based on the critical t-value. The P-values obtained for the constructs Environmental Factors, Organizational Factors, Perceived Benefit, Perceived Risks, and Technological Factors at a 5% significance level are P=0.269, P=0.000, P=0.000, P=0.000 P=0.000, respectively. This means that the constructs have a strong influence on the decision variable except for the construct of Environmental factors. The Q-square value is greater than zero, meaning that the build model has predictive relevance.

5.2.2 Summary of research findings for Qualitative Data Analysis

For Qualitative Data Analysis, the scope of this research study with respect to stakeholders like the economic buyer, technical buyer, and end-user is narrowed down to Organizations that adopted the cloud model and want to re-adopt the on-premise model.

INDIA is a growing economy and has a large presence of different types of industries with ICT tools and infrastructure enabled. All case organizations in our research study are multinational organizations operating in INDIA. Data was collected from different types of organizations over a period starting from July 2018 to the end of July 2020. In total researcher has invited 30 companies. Out of 30 invited companies, 20 have given their consent and participated in the focus group discussion and interviews. The case organizations are multi-national and national organizations located in various parts of India and are of type information technology, banks, pharmaceutical institutions, Financial Institutions, and On-line Shopping organizations in India. The respondents are from different levels of organizations like Vice presidents, Program Managers, IT-Director, IT-Managers, and IT-Admin teams. The summary of research findings for qualitative data analysis is as follows:

Summary of Data Analysis for Economic Buyer:

As discussed earlier, Economic buyer analysis represents the perspective of the people involved in the buying process and are solely responsible for activities like cost optimizations. They can approve when everyone is disapproving of the decision and they can disapprove of the decision when everyone is approving it. The variables that are derived from the integrated research model with respect to the economic buyer perspective are “Bill surprise”, “Monitoring the unused hosts”, “Early termination Charges”, “Licensing of OS and application”, “Provider Data pull out charges”, “Top management support”, “Size of the company or its IT unit”, “Relative advantage”. The summary of research findings for economic buyer analysis is as follows:

The variable “Bill Surprise” has influenced 7 case organizations (O1, O2, O3, O6, O7, O8, O10) that participated in this research study. It is found that organizations are attracted by the initial offerings but after some time billings end up being significantly greater than predicted. The variable Monitoring the unused hosts has influenced 7 case organizations (O1, O2, O8, O10, O11,

O12, O13) participating in this research study. It is found that the UAT setup is not monitored on regular basis resulting in much higher bills. The factor "Early termination Charges" has influenced only 1 case organization (O10) that participated in this research study. It is found that the termination charges work as a lock-in period, if any customer wants to terminate the cloud services, then they need to pay the early termination charges. The factor "Licensing of OS and application" has influenced 5 case organizations (O9, O10, O14, O15, O16) participating in this research study. It is found that the cost of licensing application also plays an important role for organizations who wants to re-adopt back to the on-premise model.

The variable "Provider Data pull out charges" has influenced 7 case organizations (O1 – O7) participating in this research study. It is found that Cloud service vendors also charge for the data being downloaded on a per MB basis. So, if any organization wants to re-adopt an on-premise application, then they should also check the data pull-out charges from the cloud service vendor. The variable "Top management support" has influenced 6 case organizations (O1, O2, O3, O6, O7, O8) that participated in this research study. It is found that "Top Management support" is the key factor in decision-making. The top management should support and approve the budget involved in the re-adoption process. The factor "Size of the company or its IT unit" has influenced 3 case organizations (O1, O2, O8) that participated in this research study. It is found that, if the size of the company is large then it is very tedious to re-adopt on-premise applications. The factor relative Advantage has influenced 7 case organizations (O1, O2, O3, O6, O7, O8, O10) participating in this research study. It is found that "relative advantage" in terms of costs plays an important role when organizations want to re-adopt back to the on-premise model of the enterprise software product.

The most significant factors with respect to the economic buyer that plays an important role in re-adopting on-premise infrastructure are "bill surprise" and "top management support".

Summary of Data Analysis for Technical Buyer & End-User:

As discussed earlier, technical buyer and end-user analysis represents the perspective of the people involved in the buying process and are solely responsible for technical and end-user activities like the ease of use for end-users, and evaluation of the product or solution technically. The variables that are derived from the integrated research model with respect to Technical buyer and End-User

perspective are “Performance”, “Local data retention laws”, “Risk mitigation strategies”, “Monitoring the unused hosts”, “Awareness level of IT team”, “Availability of the required organizational resources”, “Compatibility”, “Complexity”. The summary of research findings for technical buyer and end-user analysis is as follows:

The variable “Performance” has influenced all case organizations (O1 – O20) participating in this research study. It is found that the performance of applications in the cloud is different when compared to on-premise deployment. For the same amount of computing resources, the performance of the application is less in cloud deployment than in an on-premise environment. The variable “Local data retention laws” has influenced all case organizations (O1 – O20) participating in this research study. It is found that “local data retention laws” are more important for organizations that are of type banking, finance, or that work with government projects. The variable “Risk mitigation” strategies have influenced 7 case organizations (O1, O2, O3, O6, O7, O8, O10) that participated in this research study. It is found that attacks in a cloud deployment cannot be handled because the intrusion prevention systems are not available in a cloud environment, unlike on-premise environments.

The variable “Monitoring the unused hosts” has influenced 8 case organizations (O3, O6, O7, O10, O9, O14, O15, O16) that participated in this research study. It is found that large organizations often do the trial test before deploying the applications in the live environment. These test environments are unattended by the IT Admins and resulting in various issues like cost, security, etc. The variable Awareness level of the IT team has influenced 14 case organizations (O3, O6, O7, O10, O4, O5, O9, O14 – O20) that participated in this research study. It is found that technical awareness of the IT team is important when organizations want to re-adopt on-premise deployment again. The variable “Availability of the required organizational resources” has influenced 8 case organizations (O1 – O8) that participated in this research study. It is found that “organizational readiness” in terms of IT Team technical expertise plays an important role when organizations want to re-adopt on-premise deployment again. The variable “Compatibility” has influenced 5 case organizations (O1, O2, O3, O6, O7) that participated in this research study. It is found that compatibility with existing on-premise infrastructure plays an important role when organizations want to re-adopt the on-premise deployment model again. The variable “Complexity” has

influenced 7 case organizations (O1, O2, O3, O6, O7, O8, O10) participating in this research study. It is found that on-premise deployments are complex when compared to cloud deployments.

The most significant factors with respect to Technical buyers & End-User that plays an important role in re-adopting on-premise infrastructure are performance and local data retention laws.

Finally, the researcher concludes that some of the above-mentioned factors have influenced all case organizations, and some influenced only a few case organizations that participated in this research study. The organizations that re-adopted the on-premise deployment model are of type banking, financial institutions, government organizations, or organizations working with government projects. There are also other types of large organizations re-adopting the on-premise deployment model again. The organizations which re-adopted the on-premise model again are O1, O2, O3, O6, O7, O8, and O10 where as other organizations remained with the cloud deployment model even though the factors have influenced them.

5.3. Contributions of research findings

This research study has helped organizations in making buying decisions for enterprise software product deployment models. Cloud computing is the latest advancement in the field of distributed computing, but it is not the right choice for all organizations. There are lots of complexities involved in the decision-making for adopting the right model of software product deployment. This research study has identified and examined technological, organizational, environmental, perceived benefit, and perceived risk factors influencing an organization's decision to adopt/not-adopt either the on-premise model or cloud service model of the enterprise software product. This research study has helped all kinds of buyers like economic buyers, technical buyers, and end-user in the decision-making of software product deployment models. This research study has covered industry types like IT Industry, Financial Institutions & Banking, E-Commerce, and Pharmaceuticals located in INDIA. This research can help organizations of these types of industries in growing economies to make decisions for adopting the right model of software product deployment which,e… either an on-premise model or cloud service model of the software product.

The theoretical contributions of this research study can be found in Chapters 2 and chapter 3. All the theoretical frameworks and scientific models that can be used for studying the behavior of organizations for adopting the right model of an enterprise software product are discussed in Chapters 2 and Chapter 3. However, these theories and models cannot explain the different scopes of an organization. This study has developed a conceptual model (Shown in Figure 2.6-1) which integrates the existing scientific models namely the Diffusion of Innovation, Technology-organization-environment model, and DEMATEL framework. This research study also identifies the different stakeholders involved in the process of decision-making. The critical factors that are involved in each scope and with respect to each stakeholder are identified and assessed accordingly.

5.4. Practical Implications

This research study has both academic and practical implications and it has contributions to both academia and business. This study can help both business practitioners and academic researchers. The conceptual model proposed in this study is directly associated with the contributions to the field. The proposed conceptual model can help business practitioners to make wise decisions when adopting a cloud service model from the on-premise model. The different constructs and items in each construct help organizations to understand the complexities of decision-making. Different stakeholders of business can take advantage of this study because it covers all aspects like a technological, organizational, environmental, perceived benefit, and perceived risks factors.

5.4.1. Factors influencing adoption of cloud from on-premise model of software product:

5.4.1.1 Economic buyer:

Technological Context:

Evaluation of measurement model using Smart PLS reports the outer loading value for the factor relative advantage as significant factor contributing to the construct. This is inline with the finding of (Ibrahim et al., 2022, Zhang et al., 2021, Gui et al., 2020). Relative advantage has been indicated to be one of the strongest factors in driving cloud adoption, (Chiniah et al., 2019). In general, relative advantage in terms of costs plays key role in adoption of cloud service model than on-premise model of software product. The results also reveals that the construct contributes to the

satisfaction on decision of adoption cloud service model from on-premise model of software product.

Organizational Context:

Evaluation of measurement model using Smart PLS reports the outer loading value for the factor Awareness level of IT team is the most significant factor for adoption of cloud service model. It is surprising that top management support is the second most important factor contributing to the construct. The other factors like availability of financial resources, and size of firm are also contributing equally to the context. There is very little difference between the outer loading values of all these factors. The findings of (Chiu et al., 2017, Weerd et al., 2016) are contradictory and not confirming to this research study. Awareness level of IT team is most significant factor contributing to this construct and this is inline with the findings of (Gangwar et al., 2015) where the factor Training and Education was found to be most significant than top management support. This shows that most of the organizations generally doesn't have technology readiness and lacks relevant knowledge and skill and technology infrastructure to support adoption of cloud services. It should also be noted that the construct contributes to the satisfaction on decision of adoption cloud service model from on-premise model of software product.

Environmental Context:

The results from evaluation of measurement model using Smart PLS shows that the factor external support or vendor support for adoption of cloud service model from on-premise service model plays an important role and contributes towards the construct. Almost all respondents depend on vendor's support during adoption of cloud service model from on-premise model. This is inline with the findings of (Chiu et al., 2017). Most of the adopters have a high perception towards external support whereas non-adopters have low perception towards external support. This may also indicate that external support can help in identifying the adopters or non-adopters of cloud service model. The results also reveal that the construct contributes to the satisfaction on decision of adoption cloud service model from on-premise model of software product.

Perceived Benefits Context:

The results from evaluation of measurement model using Smart PLS shows that the factor "pay only for what you use" is the most significant factor contributing to the construct. The findings of this research study are confirming with the findings of (Yoo & Kim 2018). The other factor "Requires less in-house IT staff, costs" in this construct is also contributing towards it but are not strong enabler for cloud adoption. This is confirming the results of (Yeboah-Boateng et al., 2014). The results also indicated that the factor "Monthly payments" is also contributing towards the construct and provides an easy way to get out of vendor lock-in period. The result also reveals that the construct contributes to the satisfaction on decision of adoption cloud service model from on-premise model of software product.

Perceived Risks Context:

Smart PLS results for evaluation of measurement model shows that the factors Auto-scaling and data storage charges contributes towards the construct. These results are confirming the results of research study done by (D. Chen & Zhao, 2012) and are inline with the findings of (Subashini & Kavitha, 2011). It is surprising to note that the construct is having negative contribution to the dependent variable "Decision on Satisfaction". This mean that Perceived risks path to Decision on Satisfaction have no influence on adoption of cloud service model. This is inline with the findings of (Rosado et al., 2012).

5.4.1.2. Technical and end-user buyers:

Technological Context:

Evaluation of measurement model using Smart PLS reports the outer loading value for the factor relative advantage, complexity and trialability to be the strong enabler for cloud adoption from on-premise model of software product. In general, relative advantage, complexity are the strong driving factors for adoption o cloud service model from on-premise model. This confirms the findings of (Singh & Mansotra, 2019, Chiniah et al., 2019, Kandil et al., 2018, D. Chen & Zhao, 2012, Subashini & Kavitha, 2011), . Cloud adopters have shown high level of perceived relative advantage and complexity. The other factors like compatibility and observability also contributes towards the construct but not significantly. The results also reveal that the construct contributes

significantly to the satisfaction on decision of adoption cloud service model from on-premise model of software product.

Organizational Context:

Evaluation of measurement model using Smart PLS reports the outer loading value for the factor top management support, and availability of required organizational resources are the key factor in the decision-making process for organizations adopting the cloud service model from the on-premise model. This is in line with the research findings from (Weerd et al., 2016) for adopting cloud services in Indonesian organizations. The results of this research study also confirm the findings of (Kandil et al., 2018, Al-Hujran et al., 2018). The adopters of the cloud service model have shown high level of perceived top management support and technology readiness. The results also reveal that the construct contributes significantly to the satisfaction on decision of adoption cloud service model from on-premise model of software product.

Environmental Context:

The results from evaluation of measurement model using Smart PLS shows that the factor external support or vendor support for adoption of cloud service model from on-premise service model plays an important role and contributes towards the construct. Almost all respondents depend on vendor's support during adoption of cloud service model from on-premise model. This is inline with the findings of (Baral et al., 2019, Chiu et al., 2017). Most of the adopters have a high perception towards external support. The results also reveal that the construct contributes towards the satisfaction on decision of adoption cloud service model from on-premise model of software product. The other factor government support also contributes towards the construct but not that significantly. Infact, some banking organizations are adopting hybrid solution due to local data retention laws by government authorities. This solution comprises of application running in the cloud, but data resides on on-prem servers.

Perceived Benefits Context:

The results from evaluation of measurement model using Smart PLS shows that the factors Always offer latest functionality, sharing systems with partners simpler, Data Availability, Single Sign-on process, Easy and fast to deploy to end-users and Data Accessibility are the critical factors for the

adoption of cloud service model from on-premise model and contributing towards the construct significantly. The findings of this research study confirm the results of (Rosado et al., 2012, Mangula et al., 2016). Encourages standard systems is less significant when contributing towards the construct. It should be noted that the construct contributes significantly to the satisfaction on decision of adoption cloud service model from on-premise model of software product.

Perceived Risks Context:

The results from evaluation of measurement model using Smart PLS shows that the factors perceived risk factors are Application Sensitivity, Virtualization vulnerability, Data Privacy, Authentication and authorization, Data security, Data integrity, Data locality, Network and web application security are contributing towards the construct. These findings are in line with the findings from Rosado et al., 2012. The other factors such as Identity Management, Data backup are also contributing towards the construct but not significantly. It should be noted that the construct doesn't contribute towards the Decision on Satisfaction. This mean that if the construct contributes towards the Decision on Satisfaction then the organizations will not adopted cloud from on-premise model.

5.4.2. Factors influencing re-adoption of on-premise model from cloud service model of software product:

The findings of this research study also revealed that cloud computing hype is at its peak and organizations are adopting the cloud without understanding the long term effect. As a result, these organizations are re-adopting or moving back to the on-premise model of the software product.

5.4.2.1. Economic buyer

Bill surprise

The results of NVivo analysis show that bill's surprise is one of the key reasons for the re-adoption of on-premise model from cloud service model. The re-adopters of on-premise model have shown a high level of bill surprise concern towards cloud model. 7 out of 20 participants were influenced by this factor and re-adopted the on-premise model again. Though cloud service model is having lots of other benefits, but organizations should consider the long terms and adopt it.

Monitoring the unused hosts

The results of NVivo analysis show that monitoring the unused hosts is also a strong reason for the re-adoption of on-premise model from cloud service model. 7 out of 20 participants were influenced by this factor and re-adopted the on-premise model again.

Early termination or leaving the cloud provider charges/Exit Charges

The results of NVivo analysis show that Exit charges does not contribute towards the re-adoption of on-premise model from cloud service model. Only 1 out of 20 participants were influenced by this factor and re-adopted the on-premise model again.

Licensing of OS and application

The results of NVivo analysis show that Licensing of OS and application is also an important reason for the re-adoption of on-premise model from cloud service model. 5 out of 20 participants were influenced by this factor and re-adopted the on-premise model again.

Provider Data pull out charges

The results of NVivo analysis show that Provider Data pull out charges is also an important reason for the re-adoption of on-premise model from cloud service model. 7 out of 20 participants were influenced by this factor and re-adopted the on-premise model again. The re-adopters of on-premise model have shown a high level of provider data pull out charges concern towards cloud model.

Top management support

The results of NVivo analysis show that top management support is also an important reason for the re-adoption of on-premise model from cloud service model. 6 out of 20 participants were influenced by this factor and re-adopted the on-premise model again.

Size of the company or its IT unit

The results of NVivo analysis show that size of company or its IT unit is not much contributing toward the re-adoption of on-premise model from cloud service model. Only 3 out of 20 participants were influenced by this factor and re-adopted the on-premise model again.

Relative advantage

The results of NVivo analysis show that relative advantage is also an important reason for the re-adoption of on-premise model from cloud service model. 7 out of 20 participants were influenced by this factor and re-adopted the on-premise model again. Relative advantage is strong enabler for re-adoption of on-premise model.

5.4.2.2. Technical buyer and End user

Performance of Software product in Cloud

The results of NVivo analysis show that performance of application is also an strong reason contributing towards the re-adoption of on-premise model from cloud service model. All 20 participants were influenced by this factor but only 7 re-adopted the on-premise model again.

Local data retention laws

The results of NVivo analysis show that Local data retention laws is also an important reason for the re-adoption of on-premise model from cloud service model. All 20 participants were influenced by this factor but only 7 organizations re-adopted the on-premise model again. Local data retention laws from the regulatory body also play an important role in re-adopting the on-premise model.

Risk mitigation strategies

The results of NVivo analysis show that Risk mitigation strategy is also an important reason for the re-adoption of on-premise model from cloud service model. 7 out of 20 participants were influenced by this factor and re-adopted the on-premise model again.

Monitoring the unused hosts

The results of NVivo analysis show that monitoring unused hosts is also an important reason for the re-adoption of on-premise model from cloud service model. 8 out of 20 participants were influenced by this factor but 7 organizations re-adopted the on-premise model again.

Awareness level of IT team

The results of NVivo analysis show that Awareness level of IT team is also an important reason for the re-adoption of on-premise model from cloud service model. 14 out of 20 participants were influenced by this factor but only 7 re-adopted the on-premise model again.

Availability of the required organizational resources

The results of NVivo analysis show that organization readiness is also an important reason for the re-adoption of on-premise model from cloud service model. 8 out of 20 participants were influenced by this factor but only 7 re-adopted the on-premise model again.

Compatibility

The results of NVivo analysis show that Compatibility is also an important reason for the re-adoption of on-premise model from cloud service model. 5 out of 20 participants were influenced by this factor and re-adopted the on-premise model again.

Complexity

The results of NVivo analysis show that complexity is also an important reason for the re-adoption of on-premise model from cloud service model. 7 out of 20 participants were influenced by this factor and re-adopted the on-premise model again.

5.5. Research Limitations

The limitations of this research study are discussed in this section and the readers should understand that the main intention of this research study is to overcome the complexities involved in decision-making while adopting the software product's deployment model. Like other research studies, this research also helps in identifying and studying the factors that can influence the adoption of the software product deployment model. The limitations of this research are mainly divided into three sections namely scope limitations, geographical limitations, and cloud services limitations.

Scope Limitations

There are three scopes discovered during the pilot study which are mentioned below:

- Organizations with a new requirement to buy enterprise software products can adopt either an on-premise model or a cloud model of the software product.
- Organizations that already have the on-premise model of software product wants to adopt the cloud computing model.
- Organizations that adopted the cloud model want to re-adopt the on-premise model.

This research study has presented the findings for Qualitative data analysis for "Organizations which already have cloud computing model of software product wants to re-adopt on-premise model of software product again". However, for Quantitative data analysis, the findings are presented only for the scope "Organizations which already have the on-premise model of software product wants to adopt cloud computing model". This is because the data collected for other scopes is insufficient for quantitative data analysis. Most of the organizations are 5 – 20 years old and have already adopted the on-premise model of the software product.

Geographical limitations

The research study is carried out in INDIA which has a high presence of multi-national companies. Data is collected from multi-national companies which have IT infrastructure available. Data collected from respondent organizations are from cities like Bengaluru, Hyderabad, Pune, and Chennai. Since INDIA is a developing country and the findings may be generalized to other developing countries as well. However, the same may not be true for already-developed countries. These countries will have different governing laws which restrict the usage of technologies outside their territory.

Cloud services limitations

Cloud computing technology is available in two models, and they are Private cloud, Public cloud. This research study majorly focuses on the public cloud services like Software-as-a-service (SaaS), Infrastructure-as-a-service (IaaS), and Platform-as-a-service (PaaS). These services are available to organizations over a public medium like the internet. However, the private cloud is available over a private network and is made available to only a few customers by the cloud vendor. There

is one more upcoming model “Hybrid cloud”. This is being majorly used by banking and financial institutions where the application is hosted in the public cloud and data is stored in the private cloud or on-premise infrastructure. The other public cloud services which are not included in this research study are Monitoring-as-a-service (MaaS), Communication-as-a-service (CaaS), and Anything-as-a-service (XaaS).

Other Limitations:

- The data collected using a survey questionnaire allowed respondents to select the influence level of each factor. It is possible that some respondents are biased towards a particular deployment model of the software product. This is eliminated by ensuring the sampling framework is adequate and by increasing response rates. (Heywood et al., 1995)
- The data collection period ranges from July 2018 to July 2020. The data collected is linked with the period which is pre-pandemic and highly influenced by the environment and dynamics of that period. Due to resource and time limitations, subsequent changes after the pandemic are not considered.
- The data is collected limited to the software products generally used by any type of organization such as Email servers, Wiki, Bug Tracking Software, Firewall, VPN, Employee Database, HRIS software, Online collaboration tools(zoom, Google meeting), etc.
- Monetary value of the product also plays an important role. This is not covered as an influencing variable in the study due to the stage at which this factor is discovered.
- Cyber Security risks factors for cloud includes several items such as Data Privacy, Data breaches, Un-Authorized access, Malware infections, Cyber-attacks, Data loss, API vulnerabilities, (Zainab Al Mehdar 2023). This research study has considered only Data Privacy, Authentication and Authorization due to unavailability of information at the time of data collection.
- Customers of an organization also influence the decision process. This is not covered as an influencing variable in the study due to the stage at which this factor is discovered.
- India is a developing nation and has a large presence of MNCs. This study majorly focused MNCs.

5.6. Directions for future research

Future research with respect to scope:

For Quantitative data analysis, this research study mainly focuses on adopting cloud technologies from an on-premise deployment model with respect to scope. The scope available for future research is as follows:

- Organizations with a new requirement to buy enterprise software products can adopt either an on-premise model or a cloud model of the software product.
- Organizations that adopted the cloud model want to re-adopt back to the on-premise model.

Future researchers should be able to find start-up companies that are in the process of making the decision to buy either on-premise or cloud computing models of software products. This will help in performing more extensive research for the scope "Organizations with a new requirement of buying enterprise software products can adopt either an on-premise model or cloud model of the software product since the cloud technologies are still emerging and being adopted by the organizations. But they are not suitable for all organizations. Researchers should be able to find the organizations which are re-adopting on-premise models of the software product in the near future and extensive research should be performed with the help of these kinds of organizations. This might discover additional factors responsible for re-adopting the on-premise model of the software product.

Future research with respect to cloud services:

There are new upcoming public cloud services like Monitoring-as-a-service (MaaS), Communication-as-a-service (CaaS), and Anything-as-a-service (XaaS). Researchers can do extensive research and find organizations that are adopting these public cloud services.

Other Future Research Directions:

- There is also a scope to do research for the adoption of private cloud and hybrid cloud services.
- There is also a scope to make a Strength, Weakness, Opportunities, and Threat (SWOT) Analysis after the adoption of Cloud services.
- Product's monetary value also plays an important role. The research can be done separately for products of high monetary value.

5.7. Concluding Remarks

Cloud service models were believed to replace the traditional on-premise model of software product. But due to several security factors, data retention laws cloud service models were not able to replace the on-premise model completely. The rate of adoption for cloud service model is high for SMEs and large organizations who doesn't get influenced with security factors, data retention laws. This research study is focused on ICT products for enterprise like Email services, Authentication services, VPN, Device management, Policy management etc. The research study investigates the view points of different stakeholders like economic buyer, technical buyer and end user. First of all, with regard to scope "Organizations which already have the on-premise model of software product wants to adopt cloud computing model" and with respect to stakeholder economic buyer, the factor "Top management support" is the key enabler for the adoption of cloud computing model of the enterprise software product. The top management should support the costs involved in the adoption process considering the long-term goals of cost optimization of an organization. The factor of Organizational readiness in terms of financial resources also plays an important role in overcoming the complexities. The other important factors in this scope are "Pay only for what you use", "Awareness level of IT team", "Data storage charges" and "Autoscaling of computational resources charges".

With respect to technical buyers & end-user, the factor "Top management support" plays a critical role. The more the managers are skilled with cloud technology, the more adoption of the cloud services model. There are also other factors that play significant roles in adoption of cloud service models and they are Relative advantage, Compatibility, Trialability, Complexity, Data Security, Data Privacy, Network and web application security, Virtualization vulnerability, and Identity Management. The research study also indicates that relative advantage, complexity, and compatibility are the strongest factors in influencing cloud adoption. Cloud adopters can be identified with a high level of perceived relative advantage and compatibility.

Finally for the scope "Organizations which adopted cloud model wants to re-adopt on-premise model," the most important factor is "Bill surprise". Organizations were attracted to cloud technologies due to initial promotional offerings but after some time the billings ends up being significantly greater than predicted. This will affect the long terms goals of organizations and

eventually force them to re-adopt the on-premise model of the software product. The other important factor which plays a key role is top management support. The most significant factors with respect to Technical buyers & End-User that plays an important role in re-adopting on-premise infrastructure are performance, and local data retention laws.

5.8. Summary

This chapter presented the summary of findings, results, and conclusions. The summary of findings for qualitative data analysis representing all scopes is discussed initially. This discussion is followed by the quantitative analysis of data with respect to scope "Organizations which already have the on-premise model of software product wants to adopt cloud computing model". The findings and analysis indicate that the null hypothesis is rejected, and the alternate hypothesis is accepted for all scopes and with respect to stakeholders like the economic buyer, technical buyer & end-user. The chapter has proceeded with the contributions of this research study and its practical implications. This will guide organizations to make wiser decisions and understand the complexities involved in decision-making. Finally, the limitations of this research study are discussed which reveals that there is enormous scope for future research. It should be noted that cloud computing technologies are being adopted by organizations, but they are not a good fit for all organizations. Organizations should understand the pros and cons of adopting cloud technologies by studying the various factors and decision-makers involved in the adoption process of either on-premise or cloud computing models of the enterprise software product.

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APPENDICES

Appendix I – Economic Buyer Survey Questionnaire - Organizations having an On-premise model of software products adopting Cloud computing model

Dear Respondent,

This questionnaire is prepared regarding a research activity related to the Ph.D. program at ICFAI University, Jharkhand on "Factors Influencing Cloud Adoption By The Organizations For Enterprise Software Products". Software products in ON-PREMISE mode will be available on the premises of the building customer. In contrast, software product in the CLOUD-COMPUTING model consists of Software-as-a-Service (SaaS), Infrastructure-as-a-Service (IaaS), and Platform-as-a-Service (PaaS) models and they will be available in the vendor site.

I shall be highly grateful if you could spare a few minutes to complete the questionnaire. There are no right or wrong answers to the questions. Answers given by you will be kept confidential and used for academic purposes only.

Section 1 - Demographic Information of Participant and Organization

Name		***Organization Name***	
Email		***Organization size***	
Your Education		***Organization age***	
Your Age Group		***Total Assets*** *(Approximate)*	
Designation in the company		***Industry type*** *Banking, Financial, IT, Pharmaceutical, etc.*	

Please list the software products being used in your organization.	
On-Premise	**Cloud Computing**

Section 2: Survey Questionnaire:

S.No	Survey Questions/ Scale	Least Important 1	2	3	4	Most Important 5
	Technological Factors					
1	Relative Advantage (in terms of costs)					
	Organizational Factors					
2	Awareness level of IT team related to Cloud Computing model of software product (Do they need trainings. How much training costs)					
3	Top management support (in terms of Costs)					
4	Availability of the required organizational resources (financial)					
5	Size of the company or its IT unit (No. of employees)					
	Environmental Factors					
6	External Support (vendor charges)					
	Perceived Benefit Factors					
7	Pay only for what you use (Cloud users will pay only for features being used in the product)					
8	Monthly payments (Payment are done on monthly basis)					
9	Requires less in-house IT staff, costs (Vendor will provide support to cloud infrasturucture, Customer need not maintain IT staff, thus saves costs of maintaining staff)					
	Perceived Risk Factors					
11	Autoscaling of computational resources charges (CPU, RAM, etc.. will get multiplied when load increases)					
12	Data Storage charges					
	General Questions	**Strongly Disagree 1**	**2**	**3**	**4**	**Strongly Agree 5**
14	Our decision to adopt On-cloud from On-premises was a wise decision					
15	Satisfied with the decision of adopting On-cloud from On-premises					
16	Intent to go for On-cloud in all future adoption as well					
17	I am willing to recommend others to adopt On-cloud from On-premises					

Appendix II – Economic Buyer - Organizations having a Cloud computing model of software products adopting an On-premise model

Section 1 - Demographic Information of Participant and Organization

Name		***Organization Name***	
Email		***Organization size***	
Your Education		***Organization age***	
Your Age Group		***Total Assets*** *(Approximate)*	
Designation in the company		***Industry type*** *Banking, Financial, IT, Pharmaceutical, etc.*	

Please list the software products being used in your organization.

On-Premise	**Cloud Computing**

Section 2: Interview Questions:

1	Bill surprise (promotional rate pulls organizations in, but the real rate ends up being significantly higher than forecasted)
2	Monitoring the unused hosts (Resources left idle needs to be monitored and switched-off)
3	Early termination or leaving the cloud provider charges/Exit Charges
4	Licensing of OS and application (License model is different in On-premise than Cloud)
5	Provider Data pull out charges (Cloud provider will charge for data pulled out due to contract termination)
6	Top management support (in terms of costs)
7	Size of the company or its IT unit (No. of employees)
8	Relative advantage (in terms of Costs)
	General Questions
9	Our decision to adopt On-premises from On-cloud was a wise decision
10	Satisfied with the decision of adopting on-premises from On-cloud
11	Intent to go for on-premises in all future adoption as well
12	I am willing to recommend others to adopt on-premises from On-cloud

Appendix III – Technical Buyer and End User Survey Questionnaire - Organizations having an On-premise model of software products adopting a Cloud computing model

Dear Respondent,

This questionnaire is prepared regarding a research activity related to the Ph.D. program at ICFAI University, Jharkhand on "Factors Influencing Cloud Adoption By The Organizations For Enterprise Software Products". Software products in ON-PREMISE mode will be available on the customer's premises. In contrast, software product in the CLOUD-COMPUTING model consists of Software-as-a-Service (SaaS), Infrastructure-as-a-Service (IaaS), and Platform-as-a-Service (PaaS) models and they will be available in the vendor site.

I shall be highly grateful if you could spare a few minutes to complete the questionnaire. There is no right or wrong answers to the questions. Answers given by you will be kept confidential and used for academic purposes only.

Section 1 - Demographic Information of Participant and Organization

Name		***Organization Name***	
Email		***Organization size***	
Your Education		***Organization age***	
Your Age Group		***Total Assets*** *(Approximate)*	
Designation in the company		***Industry type*** *Banking, Financial, IT, Pharmaceutical, etc.*	

Please list the software products being used in your organization.	
On-Premise	**Cloud Computing**

Section 2: Survey Questionnaire:

S.No	Survey Questions/ Scale	Least Important 1	2	3	4	Most Important 5
	Technological Factors					
1	Relative advantage (in terms of Technology)					
2	Compatibility (with existing IT infrastructure)					
3	Complexity (Ease of Use)					
4	Trialability (experiment the product before decision)					
5	Observability (observe the results during experiment)					
	Organizational Factors					
6	Top management support (in terms of technology and innovation)					
7	Availability of the required organizational resources (IT expertise, and/or IT infrastructure)					
	Environmental Factors					
8	External support (Customer Support/Online Forums)					
9	Government support (Technology Support regulations)					
	Perceived Benefit Factors					
10	Easy and fast to deploy to end-users					
11	Encourages standard systems (Supports shifting between different cloud providers)					
12	Always offers latest functionally (All new features are supported in Cloud due to monthly releases)					
13	Sharing systems with partners simpler (Just need to create an account)					
14	Single Sign-on process (Ease of use, authentication to one product will authorize to different products)					
15	Data Availability (Data is available to legitimate users using High availability and redundancy)					
16	Data Accessibility (Data is Accessible to users when needed)					
	Perceived Risk Factors					
17	Data locality (Data location is in local geography)					
18	Data security (Data is secured when stored in cloud servers)					
19	Network and web application security (Design of network and application security in cloud)					
20	Data integrity (Gurantee that data is not tampered when stored in cloud servers)					
21	Authentication and authorization (Authentication to legitimate users and they are authorize to access resources)					

22	Data Privacy (Provider ensure secure separate segregation of data at physical layer)					
23	Application Sensitivity (Software might have IPR which cannot be exposed in Cloud)					
24	Virtualization vulnerability (Virtualization software of Cloud vendor is not vulnerable)					
25	Data backup (daily/weekly/monthly back up of data. In case of failure, restore last backup)					
26	Identity Management (How identities are secured)					
	General Questions	**Strongly Disagree 1**	**2**	**3**	**4**	**Strongly Agree 5**
27	Our decision to adopt On-cloud from On-premises was a wise decision					
28	Satisfied with the decision of adopting On-cloud from On-premises					
29	Intent to go for On-cloud in all future adoption as well					
30	I am willing to recommend others to adopt On-cloud from On-premises					

Appendix IV – Technical Buyer and End User - Organizations having Cloud computing model of software product re-adopting On-premise model

Section 1 - Demographic Information of Participant and Organization

Name		***Organization Name***	
Email		***Organization size***	
Your Education		***Organization age***	
Your Age Group		***Total Assets*** *(Approximate)*	
Designation in the company		***Industry type*** *Banking, Financial, IT, Pharmaceutical, etc.*	

Please list the software products being used in your organization.

On-Premise	**Cloud Computing**

Section 2: Interview Questions:

1	Performance of Software product in Cloud
2	Local data retention laws (Data should be stored in local data centres)
3	Risk mitigation strategies (Stratergy in case of Hacking Attacks/Service breakdown/Vulnerabilities)
4	Monitoring the unused hosts (Idle hosts should be turned-off)
5	Awareness level of IT team related to ON-Premise
6	Availability of the required organizational resources (IT expertise, and/or IT infrastructure)
7	Compatibility (Compatible with exisiting infrastructure)
8	Complexity (Ease of use)
	General Questions
9	Our decision to adopt On-premises from On-cloud was a wise decision
10	Satisfied with the decision of adopting from on-premises On-cloud
11	Intent to go for on-premises in all future adoption as well
12	I am willing to recommend others to adopt on-premises from On-cloud

Appendix V – Publications of the Scholar in the Area of Research

1. Rehman M.H, Rajkumar M (2022). On-Premise or Cloud Computing: An Integrated Novel Approach to study the adoption of Software product's deployment model with different scopes. Lecture Notes in Networks and Systems, Seventh International Conference on ICT for Sustainable Development (ICT4SD-2022)

2. Rehman M.H, Majumdar S, Rajkumar M (2020). Overcoming The Complexities In Decision Making For Enterprise Software Products: Influence Of Technological factors. Lecture Notes in Networks and Systems, Fifth International Conference on Information and Communication Technology for Competitive Strategies (ICTCS-2020)

3. Rehman M.H, Majumdar S, Rajkumar M (2020). Examining the Influence of Decisive Factors on Organizations: Migration to On-Premise Software Product from Cloud Computing. Test Engineering & Management, Volume 83, Page Number: 24178–24196, Publication Issue: May-June 2020

4. Rehman, M.H, & Dr. Rajkumar M (2019). Buying Behavior of Organizations for Software Products: Influence of Environmental Factors. Restaurant Business. 118. 252-271. 10.26643/rb.v118i10.9321.

5. Rehman M.H, Majumdar S, Rajkumar M (2019). Benefit and Risk Factors Influencing Organizations to Migrate from On-Premise to Cloud Computing Model of Software Product, Smart Intelligent Computing and Applications, Third International Conference on Smart Computing and Informatics, Springer (Volume 2 pp.185 – 202)

6. Rehman M.H, Majumdar S, KRISHNA C.Y.S(2017). Adoption of Infrastructure as a Service (IaaS) in Organizations in Bengaluru, India: A Study with Respect to Organizational Factors for Mobile Device Management Software Products, International Journal of Applied Business and Economic Research (Volume 15, Part – II, pp. 497 – 509)

7. Rehman M.H, Majumdar S, KRISHNA C.Y.S(2017). Assessment of factors impacting customer buying behaviour in software product companies, IUJ Journal of management (Vol. 5, pp. 21-25)

Conferences Attended:

1. Seventh International Conference on "ICT Sustainable Development (ICT4SD - 2022)" held on July 30th, 2022 and presented a paper "On-Premise or Cloud Computing: An Integrated Novel Approach to study the adoption of Software product's deployment model with different scopes".

2. Fifth International Conference on "INFORMATION AND COMMUNICATION TECHNOLOGY FOR COMPETITIVE STRATEGIES (ICTCS-2020)" held on December 12th, 2020 and presented the paper "Overcoming The Complexities In Decision Making For Enterprise Software Products: Influence Of Technological factors".

3. International conference on Advances in Science, Technology, Engineering and Management (ICASTEM – 2020) held on June 20th, 2020 and presented the paper "Examining the Influence of Decisive Factors on Organizations: Migration to On-Premise Software Product from Cloud Computing"

4. ESN – International Conference on Advances in Management (ESN - ICAM) held on 28th of September 2019 and presented the paper "Buying Behavior of Organizations for Software Products: Influence of Environmental Factors".

5. Third International Conference On "SMART COMPUTING & INFORMATICS (SCI)" held on December, 22nd 2018 at KIIT, Bhubaneshwar and presented the paper "Benefit and Risk Factors Influencing Organizations to Migrate from On-Premise to Cloud Computing Model of Software Product".

6. SIMSARC17 - International Research Conference held on December 16th, 2017 at Symbiosis Institute of Management Studies (SIMS), Pune and presented the paper "Adoption of Infrastructure as a Service (IaaS) in Organizations in Bengaluru, India: A Study with Respect to Organizational Factors for Mobile Device Management Software Products".

7. National Doctoral Conference 2017 on “Trends in management Research” held on March 9th, 2017 at ICFAI University, Jharkhand and presented the paper “Assessment of factors impacting customer buying behavior in software product companies”.