CHAPTER I

INTRODUCTION

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Millions of rivets together hold one of the wonders of the world, Eiffel Tower to stand erect which gives an elegant view. Similarly, micro, small and medium enterprises together balance the economy of a country. Development of MSMEs is the growth of the economy of a country. Technology rules the modern world. All the businesses adopt some kind of technology to survive in this competitive environment. Technology revolutionizes a business and in the case of MSMEs, revolutionizing the business of MSMEs makes a growth in the economy of the country. In India, apart from the financial support for startups and improving the business, the government aids MSMEs for the upgradation of technology. There are many new technologies with low prices that MSMEs can even adapt to. One among them is Enterprise Resource Planning system on Cloud (Cloud ERP).

MICRO, SMALL AND MEDIUM ENTERPRISES (MSMES)

MSMEs are classified based on the investment in plant and machineries, turnover and number of people working in the organization. When the investment in plant and machinery of manufacturing sector not exceeding one crore rupees and turnover up to five crores, it is called as micro enterprise. If the investment is about 10 Crore rupees and the turnover within 50 crores, it is called as small enterprises. When the investment is within twenty crores and the turnover not exceeding 250 crore rupees, the enterprise is called as medium enterprises (msme.gov.in). The MSMEs are also differentiated in case of number of people employed in an organization. If the number of people working in an organization is less than 10, it is called as micro enterprise. An organization is called as small enterprise when the number of workers is about 50. Medium enterprises have number of employees about 250. More than 11 million MSME units are there in India and more than 8000 quality products are produced by them for both Indian and International markets. Development of rural areas mainly depends upon the development of MSMEs. 120 million employments have been generated by MSMEs (Verma P., 2021).

The main role of MSMEs is rural employment generation, mobilization of resources & entrepreneurial skill, equitable distribution of income, providing opportunity for the development of technology, regional dispersion of industries, supporting the growth of small industries, promotes exports and indigenization. Technology adoption, financial aid provided

by government, banks, local & foreign fund providers are the motives for the survival and growth of MSMEs.

Everything in the world is now switching to a digital environment as it is easy and time saving. In India in 2015, a scheme named Digital India has been developed in order to empower the Indian citizens with the digital world. All the business sectors are digitized nowadays. There is the word on the street that MSMEs cannot afford new technologies as the adoption of technologies costs a lot. But many enterprises made it erroneous and evinced that even MSMEs can also afford technologies as there are many affordable technologies which suits their businesses. Liao *et. al,* 2019 made a study on the adoption of information technology in South Indian MSMEs and found that the technology adoption fully depends on the knowledge and attitude of the owners towards the technology.

Digital MSME

Digital MSME is an Indian government scheme which is launched on 27th June 2017 mainly for the promotion of adopting technologies in MSMEs (Hima Bindhu, 2020). This provides Rs. 1 lakh with a subsidy of 60% in two years. This is applicable only for the organization with the investment of less than Rs. 5 crores. MSMEs with valid Udyog Aadhar Memorandum are applicable for this scheme. The objectives of this scheme are to encourage the adoption of cloud computing, to encourage the business activities, to increase the count and growth of MSMEs and to aid the MSMEs to be connected with the technology centers. Also the services provided through this scheme are accounting, ERP, manufacturing design and regulatory compliance including GST (Amini M, 2014).

1.1 ENTERPRISE RESOURCE PLANNING (ERP)

Enterprise Resource Planning acts as the root of a tree which holds the trunk, here it is an organization and the many branches of the tree which are the various departments or sections of the organization. ERP is a multi-dimensional system that combines all the activities and functions of an organization in one database (Nouri *et. al*, 2016). This system encompasses all the business functions with information technology (Slooten and Yap, 1999). This integration is made easy as it has so many modules which fit for all the activities of any type of organization. People's need, expectation and demand for easiness always lead the way for innovation, just as the evolution of ERP.

Evolution of ERP

Evolution of enterprise resource planning started with inventory management in the 1960s (Hossain *et. al*, 2001). This includes both information technology and business processes. The functions of inventory management are to identify the requirements, to set targets, to provide replenishment techniques, to monitor the usage of items, to reconcile the balances and to report status. As the system was big and a bit clumsy, technical people were required to take care of the mainframe computers (Katuu S., 2020). Hence this system was then modified into Material Requirements Planning (MRP) in the 1970s. This system deals with the scheduling production process which includes operations, purchase of raw materials, production structure, levels of inventory and also lot size procedure. But this system was too difficult to operate, too time consuming and the implementation cost was too high. In the period of MRP, SAP was introduced in 1972.

Next comes the modification of MRP, Manufacturing Resource Planning (MRP II) in the 1980s. This system coordinates all the manufacturing processes such as product planning, purchasing of parts, inventory control and distribution of product. But this system had some constraints such as planning & scheduling functions were absent. It could run only on one platform and it required accurate information. In 1987, Peoplesoft was introduced. This system was further modified into Enterprise Resource Planning (ERP) in the 1990s which is multi-module application software. This system improves the internal business performances, their cross functions, which is integrated with all departments such as finance, marketing, accounting and human resources. But this too has some constraints such as it needs more implementation time, implementation changes the business process of the organization, its implementation process may be never ending as it requires more maintenance. It requires IT people for the maintenance and training. Also customization is limited and data conversion is difficult. Hence in 2000s extended ERP was introduced. This is also called ERP II, eERP (Moller, 2004). This system is web enabled.

Cloud ERP

ERP applications which are accessed through a standard web server and are provided to users over the internet are called Cloud ERP (Holter, 2020). The features of this includes finance, manufacturing, distribution, human resource, payroll to CRM, supply chain management, e-business, integrated with e-commerce and sales force automation. Cloud ERP has many

advantages such as easy implementation, no need of hiring IT resources for maintenance as it is in the hands of vendors, mobility, scalability, end- user adoption, regular upgrades, no implementation cost. Earlier data security was a threat for cloud ERP users. But nowadays vendors provide a secured environment. This is only on pay-as-you-go type. Hence this type of system is mostly adopted by MSMEs. This also has some constraints like lack of ownership, internet connectivity issues, variable subscription fee for different vendors. Cloud ERP has many modules. Each modules of the system is described as follows:

1.2 MODULES OF ERP ON CLOUD

ERP on cloud has many modules. Any organization can choose these modules as per their business requirements. The molecules of a standard cloud ERP are mainly categorized into three such as functional, application and technical modules.

These modules are further classified and explained as follows:

Functional Modules:

The functional modules of cloud ERP include finance module, production module, human resource module, inventory module, purchase module, sales module.

Finance Module:

This is the core module of all ERP systems. This module helps to simplify and automate financial management. This module in which all sorts of financial reports such as trial balance, trading account, profit and loss account, debtor's balance, creditor's balance, bank fund position and balance sheet can be generated. The features of this module includes general ledger, fixed asset management, multi-currency management, tax management, risk management, reports, profit tracking, account payable and account receivable.

It removes the duplicate data entries. It integrates financial data with all business functions. Provide real time access to complete and accurate financial information. Prepares financial reports and helps to make necessary decisions in the business. It supports multiple global financial reporting standards and currencies, available in twenty seven languages and localization of forty two countries. Transactions in this can automatically trigger corresponding journal entries in real time. It includes tools for cash flow control. Also it provides efficient reconciliation of bank statements receivables, collections and payments.

Fixed assets will be managed throughout its lifecycle. It automates incoming and outgoing payments and can be automated and accelerated. Manage the cash flow of a firm, control budget and track assets, bank statements and payments, transform business planning and audits, automatically calculates taxes on each transaction.

Production Module:

This module helps in procurement planning, purchase order management, selection of vendors and invoice payment. This manages the vendor data, purchase price, inventory levels and sales prices and supplier relationships. Purchase orders with multiple currencies and categories of items can be created here. Price lists which are predefined and discounts on the items will be automatically applied. Taxes will also be calculated automatically. By transferring appropriate data from purchase order, vendor invoices and goods receipts can be created. With the purchase order, an account payable invoice can be created. Vendors can update their offers online with the URLs sent through emails. Purchase documents are linked for audit purposes. This includes the details of bar code, unit of measure, vendor catalog numbers and alternative items.

This module manages vendor information with payment terms and methods. This performs purchase analyses for vendor master records. Graphical displays can be created from the results. Detailed information of item purchase for price lists and tax information are also managed in this module. Purchase planning can be performed here using the material requirements planning wizard. Last purchase price and inventory book values can be calculated here. Accounts payable invoice are created automatically from a purchase order. It also updates the related vendor and expense accounts. This module aids to determine the production capacity, to forecast the demand, also aids in proper inventory control, minimizes or makeover the waste and assesses the risk and gives proper control.

Human Resource Module

Human Resource Module is otherwise called as Human Capital Management module. This module includes the complete details of all the employees working in a company, their job descriptions, their performance review, their working hours, their attendance, their salary details. Also, recruitment management, time office management, payroll management, loan, leave & arrears management, HR statutory report, performance management system, training management system and employee self-service portal are the other services.

Inventory Module

This module enables the inventory control of a company. Inventory control includes tracking the quantity of the items, tracking location, keeps updating the incoming items, helps in managing inventory costs. This module manages warehouse, purchase orders, sales orders, B2B e-commerce, reports on inventory analysis and control, tracks and transfers stocks. This module helps in identifying how often an inventory is being sold over a certain period. This module helps in analyzing the inventory as per their demand, cost and supply. This also helps to maintain an adequate amount of inventory. Also this checks the quality and helps in storing surplus quantities of inventory during a crisis. This enhances customer service by preventing stock outs and any delay in delivery.

Purchase Module

The purchase module of ERP deals with inventory management, purchase order, item receipt, and production schedule. This module includes the features like acquisition of raw materials required and automates the buying process. This includes the detailed database of suppliers and service providers. This captures the material requirements and gets quotes from various suppliers. This module records the payment in PO and takes care of purchase order authorization. Also, this deals with the multiple delivery schedules, order closing and order cancellation. Purchase order processing, price, quality, delivery time, quotation quality, service bills, service contracts and bill entry are all done in this module. Purchasing order can be generated in both domestic & foreign currencies. This module also deals with all import functionalities.

Sales Module

Sales module deals with both sales and marketing activities. Order placing, scheduling, item shipment and invoicing are executed in this module. The functions of this module include both pre sales & sale activities. This tracks the whole sales order cycle. This aids in marketing surveys and sales automation force. This includes the detailed database of the business partners, customers and dealers such as contact details, bank details, credit limits and TDS details. It preserves the excise details for exporting goods. All the export and domestic sales activities of an organization are handled in this module.

Customer Relationship Module

This module provides an integrated and reliable CRM solution to support customers. This can track and manage sales opportunities. Instant price quotes, converting these quotes into orders and performing real time checks for product availability can be carried out in this module. Dashboards and reports will be created to forecast and sales analysis. This manages all the data of customers. Customer balances, credit lines and opens orders from a single screen can be done in this module. Data from the master records will be transferred automatically to the relevant transactions. This deal with the warranty information, purchase planning, searches the solutions for the problems of customers and monitors the levels of services provided to the customers. This can calculate and update the gross profit and revenue as soon as the information of customers, sales, specific customers, sales stage and expected closing dates. This also provides suitable templates for quotations, order confirmations and billings. This also creates business documents and will be sent to the customers. This maintains a knowledge base of solutions for the frequently asked questions so that the service representatives of the organization can give a quick response to the customers. This also can make market campaigns.

Warehouse and Production Management

This module helps in managing efficient inventory and production processes. Here, detailed warehouse data can be managed. This links the warehouse with the order processing and all production operations. This can track, optimize stock locations and record the stock movements and production orders can be executed. This provides reliable information about all inbound and outbound shipments and also current inventory levels. This helps in maintaining the supply chain and thus gains customer satisfaction. Product inventory, quantity at warehouses, status of stockings and movement history can also be tracked in this module. This automatically validates the movements of each goods and price change and eliminates the associated errors if any. This deals with the local and foreign currencies of each product. This enables bills of materials, shipping drop, back- to- back orders, goods issues and record goods receipts. This helps in material planning, resource requirements, on-time delivery and to maintain the level of inventory.

Technical Module

Technical module consists of basic components, networking, management information system, analytical module and application programming module. This module is always linked with the functional modules and application modules.

Application Module

This module includes supply chain management (SCM), supplier relationship management (SRM), customer relationship management (CRM) and product life cycle management (PLM). Supply chain management deals with all the stock to dock processes of an organization. (Truong, 2014) SCM function starts with updating manufacturing schedule, materials and JIT schedule will be released. Then the supplier will receive the updates and further schedule is produced here. Product will be received and will be checked with the ship notice. Suppliers will get the received notice and an amount will be generated. CRM (K.L.Choy *et. al*, 2002) is a process of managing customer relationships with an organization with the help of certain software, methodologies and internet capability and thus by attaining customer satisfaction. SRM (Park *et. al*, 2010) deals with all the suppliers perspective, purchase strategies, supplier selection, production activities and supplier assessment and product development. PLM (Michael, 2022) is a process of managing a product from its design to the final disposal through manufacturing, deployment, maintaining and culminating.

1.3 CLOUD COMPUTING

Technology in which remote servers are used for storing, managing and accessing data such as documents, images, files, videos, etc online is called Cloud Computing. Cloud Computing is used to stream videos and audios, data analysis and to deliver software on demand. This is mainly used to store data, backup the data and recovery of data. This is also used to develop new services and applications. The main characteristics of Cloud Computing are agility that works fast and resources can be shared among the users, has high reliability and availability as it minimizes the infrastructure failures, provides high scalability, multi- sharing as it aids multi users to work more efficiently. This can be used in any kind of device like tablets, phones, PC, etc. As this provides a pay- per- use type, installing the whole server in the premise will be reduced, no maintenance cost.

Types of Cloud Platform

1. **Public Cloud**

Applications and storage available over the internet to the general public is called Public Cloud (Serrano *et. al*, 2015). This is available in both pay-per- use and free mode. IT has less work, user friendly, time saving, easy & universal accessibility, low price and simple scaling are the advantages of public cloud. It also has some disadvantages such as security risk, variable bandwidth could cut off data, customization as per user, isolation and multiple tenancy. This type of cloud service is adopted mostly by major enterprises with strict security policies. Amazon Web Service, HP cloud services, Firehost, Azure, cloud foundry, VMware, singlehop are some of the public cloud services.

2. **Private Cloud**

The Cloud Platform that is implemented within the firewall of the firm is called Private Cloud (Serrano *et. al*, 2015). The IT department in the firm will control this platform. Even if a third- party has a role to manage and run the platform, the operational control will be in the hands of the firm. More data integrity, flexibility, high security, greater control over data, easy customization, low cost, efficiency, compliance, ensuring the continuity of business and geographic availability are the pros of private cloud. The main problem of this type of platform is installation & maintenance costs are high and more work force will be required. Mostly small enterprises go for this type of cloud services. Oracle, Dell, Quest Software, Citrix, IBM, EMC, nimbula are some of the Private Cloud Providers.

3. **Hybrid Cloud**

Hybrid Cloud is the one in which anyone can get public cloud in private cloud and get private cloud in the public cloud (Serrano *et. al*, 2015). Large enterprises and companies that are prone to load spikes always go for the hybrid type of cloud service. This type of cloud works well for the enterprises that are capable of using Big data. Advantages of hybrid cloud are it includes both the features of Private and Public clouds, flexible and cost effective. But this needs regular monitoring, requires more maintenance, and needs customization. This is the fast growing cloud service.

4. Community Cloud

A group of various enterprises that are allowed to use systems to share information which are maintained by one or two among them or combination of those enterprises is called Community Cloud (Anirudha and Chaudhari, 2013). As this is shared between various enterprises this is cost effective, but is costlier than public cloud. This is secured, flexible to use and scalable. This has some disadvantages like it cannot be a right choice for all kinds of enterprises, less storage, data adoption is slow and difficult in sharing responsibilities among all the enterprises.

The main types of Cloud Services are Software as Service (SaaS), Platform as a Service (PaaS) and Infrastructure as a Service (IaaS) and Database as a Service (DBaaS).

Software as a Service

SaaS (Seethamraju, 2014) is a service provided by a service provider from a centralized data server over the internet. Users normally adopt this service on a rental basis. This is also known as 'software on demand'. The benefits of SaaS (Waters, 2005) are security, reliability, data safety, disaster recovery, low cost, and multi-tenancy (Abdat *et. al*, 2010). SaaS provides a finished application. The benefits of ERP on SaaS are low upfront cost, removes the updating software cost and managing hardware cost, on- demand scalability, new functionality can be implemented easily, access supporting tools, collaborating tools and analytical tools easily with standard functionality. But the chance of customization is low with ERP on SaaS. This helps in improving alliance with various countries in financial resources. The current ERP on SaaS services includes artificial intelligence benefits, digital assistants to communicate with some other systems, connecting the workflow and supply systems with the internet of things, using block chain to share reliable data between multiple parties.

Platform as a Service

PaaS (Ebert *et.al*, 2017) is the platform in which the service provider provides hardware and software tools for the new application development, software testing and software development over the internet. This service can be used through public, private and hybrid clouds. ERP on PaaS allows customization. Great flexibility and stability can be gained when both PaaS and ERP work together (Cook, 2014). The pros of PaaS are transferable skills,

simplified application development and less operational burden. The problem in using PaaS is specific implementations provided by the cloud service provider, increased cost and complexity with the usage of multi cloud.

Infrastructure as a Service

IaaS is a service in which computational infrastructure will be provided with storage infrastructure in a centralized data centre (Anirudha and Chaudhari, 2013). Business Process Reengineering and customization is easy in ERP on IaaS, but the implementation of this service is a bit costlier than the other services like PaaS and SaaS (Al-Ghofaili and Al-Mashari, 2014). IaaS provides security infrastructure to the users (Anirudha and Chaudhari, 2013). Google and Amazon Web Services provide IaaS even for micro enterprises at low cost. The advantages of using IaaS are low cost, scalability, reliability and usage flexibility.

Database as a Service

Service which provides access to a database without any physical hardware (Lehner and Sattler, 2010) is known as Database as a Service. All the tasks and maintenance will be handled by the service providers. This is useful for small and medium type enterprises as most of them have no structured infrastructure. Auto upgrades, low cost, availability as per the requirements, no need of buying the whole system are the advantages of DBaaS service.

Types of Cloud ERP

There are various types of ERP on cloud. Some of them are SAP, Microsoft Azure, Oracle Cloud Infrastructure, Hosting SAP with Wipro Cloud, Hosting SAP server with Cloud on AWS, MVC Cloud ERP, SAP S4 HANAA, Roadmap Cloud ERP, Zoho Cloud ERP, Ramco Cloud ERP, ERP on SWAP Cloud, ERP on SQL Cloud Service, Softwings Cloud and so on are likely to be available in Coimbatore (source: Primary Data).

SAP

SAP is available in three types of cloud services namely SaaS, PaaS and IaaS. Hybrid cloud, private cloud, managed and public cloud are the deployment models for SAP cloud. Types of SAP on cloud are SAP HANA enterprise cloud (HEC) which works in IaaS platform, SAP HANA enterprise platform (SCP) which works on PaaS platform and SAP HANA cloud works on DBaaS platform (Anthony, 2021). HANA is the short form for High Performance

Analytics Appliance. The benefits of SAP on Cloud are accurate forecasting, simple acquisition with the environment, low cost, business models are easily updated, flexibility, fast querying, fast processing and data are stored in main memory (Christiansen *et.al*, 2021).

Microsoft Azure

Azure works on IaaS, SaaS and PaaS platforms. minimizes downtime, scalable even for organizations without any infrastructure, reliable, easy customization, disaster recovery, on-demand infrastructure, mobility, security updates on free, no implementation cost, 24/7 assistance (Thomas, 2022). As for security purposes, single sign-in feature and auto backup facilities are available. It monitors, protects and replicates the system for recovery.

Oracle Cloud Infrastructure

Oracle cloud provides automatic upgrades, built-in AI, helps in predicting business processes, notify over budget, default tax component, less time for data compilation, scalability, better security and low up-front cost (Prichard, 2021). This works on the SaaS platform.

Almost all the cloud ERP systems provide the same services but cost may vary. So it is up to the users to adopt a proper cloud ERP system that fulfills their business needs.

COIMBATORE

Coimbatore is the place which is situated in the state of Tamilnadu which is surrounded by Western Ghats. This city has flourished with many schools, colleges and universities. Coimbatore cuisine is also famous. The major MSMEs here are textile sector, manufacturing sector, engineering & tools, automotive components, home appliances & wet grinders, pumps & motors, jewellery, IT and BPO.

Coimbatore District Small Industries Association (CODISSIA) is the largest trade association, established in 1969 for the welfare and development of micro, small and medium enterprises in Coimbatore district. This conducts many trade fairs, buyer- seller meets, seminars, awareness in the protection of the environment and so on. There are more than two thousand members that are registered with CODISSIA. This was established with forty members in 1969. They promote MSMEs and encourage the cooperation of manufacturers and consumers. Their main activities are to assist opportunities of self- employment, entrepreneurial development, help in solving individual & collective problems, ancillary

development, promoting labour intensive industries and preparing project reports. The members of CODISSIA get the benefits of training courses, technical assistance, study tours, seminars, conferences, foreign tours, consultancy services, liaison work and vendor- vendee meet.

District Industries Centre (DIC) is started to list out all the micro, micro, small and medium enterprises and to provide assistance to MSMEs. The main role of DIC is to develop handicrafts and rural industries, to promote the overall efforts for industrialization of the district, to provide the benefits of various government schemes to new entrepreneurs, to prepare industrial profile of the district, developing training programs, assist entrepreneurs to obtain imported machineries and raw materials.

This research is carried out in the MSMEs in Coimbatore where cloud ERP has been adopted to measure the level of the intention of the continuance usage of cloud ERP system.

1.4 STATEMENT OF THE PROBLEM

Many studies regarding the adoption of cloud ERP have been made. Most of the studies are the adoption of cloud ERP system in large organizations but during recent days, most of the MSMEs have started adopting Cloud ERP and that is not studied by researchers. Since MSME contributes enormously to our economy, studying the impact of cloud ERP usage and the intention of using cloud ERP system will give good insights that may be useful both for the ERP Developers, ERP providers and ERP users. If the users have no intention of using cloud ERP system continuously it will be a great misery for the ERP providers who may invested much in the software. The system providers can survive in their business only if their users have the intention of using the system further.

1.5 RESEARCH QUESTION

- What are the factors that succor or resist an organization in the continuance use of Cloud ERP?

1.6 NEED FOR THE STUDY

- MSMEs in which especially micro enterprises cannot afford an on-premise ERP system as the whole system is costly. Hence cloud ERP due to its flexibility, ubiquitous access, upgradation, mobile access, low cost, no licensing cost, no

implementation cost, no maintenance cost, only subscription cost per use will help MSMEs to improve their business performance and can win their competitors.

1.7 OBJECTIVES OF THE STUDY

The objectives of the study are:

- To identify the factors determining the continuance usage of Cloud ERP
- To analyze the various factors that lead to the continuance usage of Cloud ERP for MSME
- To know the impact of perceived ease of use, perceived usefulness and expected performance on continuance intention to use Cloud ERP among MSMEs
- To know the relation between the demographic variables with the variables perceived ease of use, perceived usefulness, expected performance and continuance intention
- To examine the factors that succor an organization in the continuance use of Cloud ERP

1.8 SCHEME OF CHAPTERIZATION

Chapterization gives the outline of the study. This helps in organizing all the contents used in this thesis. In short, chapterization is all the chapters at a glance. This thesis is divided into five chapters. They are mentioned in the following table:

Table 1.8

Chapters	Contents
Chapter I	Title of the study, Introduction of the Study, Statement of the Problem, Research Question, Need for the Research, Objectives of the Study, Limitations of the Study and Scheme of Chapterization
Chapter II	National and International Reviews, Theoretical Background, Research Framework, Hypothesis to be Tested
Chapter III	Research Methodology- This covers the Area of the Study, Hypothesis of the Study, Research Design, Sampling Design, Sources of Data and Tools Used for Analysis
Chapter IV	Data Analysis and Interpretation of Primary Data collected
Chapter V	Summary of Findings, Suggestions, societal Contribution of the Research, Conclusion Limitations of the Research and Scope for Future Research

SUMMARY

MSMEs with the increase in demand for cloud ERP plays a vital role in the development of MSMEs. The so called cloud ERP services provide reliability, automation, flexibility, low cost, deeper security, rapid recovery and restoring, subscription based payment and so on. This makes the non- users of the system to adopt the cloud ERP systems and the current users will intend to use the system continuously. Hence the intention in the continuance usage of cloud ERP is empirically proven in this study.