

Project Dissertation Report

on

**In-depth Study of relationship between
Enterprise Resource Planning (ERP) in the
Supply Chain Management (SCM) System**

Submitted By:

Deepak Garg

Roll no: 23/EMBA/12

Under the Guidance of:

Ms Shelika Arora



DELHI SCHOOL OF MANAGEMENT
Delhi Technological University
Bawana Road Delhi 110042
Jan-June 2024

CERTIFICATE

This is to certify that Mr. Deepak Garg has completed the project report titled, **In-depth Study of relationship between Enterprise Resource Planning (ERP) in the Supply Chain Management (SCM) System** under the guidance of Ms Shelika Arora as a part of Executive – Masters in Business Administration (EMBA) curriculum of Delhi School of Management (Delhi Technological University). This is original piece of work and has not been submitted elsewhere.

(Approved on Email)
Ms Shelika Arora
Delhi School of Management
Delhi Technological University

DECLARATION

I hereby declare that the project with the title “**In-depth Study of relationship between Enterprise Resource Planning (ERP) in the Supply Chain Management (SCM) System**”, has been completed by me in partial fulfilment of **Executive – Masters of Business Administration** degree examination as prescribed by **Delhi School of Management**.

This project is uniquely prepared by me for my academic requirement only and not for any other purpose. It might not be used in the interest of any other party.

Deepak Garg
Roll No: 23/EMBA/12
E-MBA
Delhi School of Management
(Delhi Technological University)

ACKNOWLEDGEMENT

I, Deepak Garg would like to convey my gratitude to Ms Shelika Arora of Delhi School of Management, Delhi Technological University for emphasizing the project and giving me the platform to conduct such research work.

I would also like to thank Ms Shelika Arora, who, in spite of his busy schedule has always been available for any needed guidance continuously indeed; his valuable contribution and guidance have been certainly indispensable for my project work.

I am deeply grateful to all respected individuals who agreed to be a part of this research project and were instrumental in providing all the required data that was necessary to make this research project a success. I am highly indebted to their valuable contribution to my research.

I extend my warm gratitude and regards to everyone who helped me during the study.

EXECUTIVE SUMMARY

Title

Study of relationship between Enterprise Resource Planning with Supply Chain Management System.

Objectives of the Study

Examining ERP's effects and advantages on SCM organizations in greater depth is the aim of this study. Thus, this model explores the connections between SCM competencies and the advantages of ERP deployment. This study groups the benefits of ERP into six components and concludes that they may enhance firm competencies in supply chain management "SCM" based chosen literature and research.

Benefits by strategic IT planning

Benefits by operations

Benefits by Planning and control process

Business process and management benefits

Benefits by Customer and relationship

The majority of businesses (71% of all businesses) who have integrated IT have improved in some way across the board. This is a significant outcome since the accomplishments, particularly in the measures with scores higher than "four" on the five-point scale, may encourage other businesses to integrate them into their supply chain systems.

Suggestions

ERP solutions can be implemented in a variety of ways to benefit SCM organizations. The following considerations will be made when a company plans to install a new ERP:

The selection of an ERP vendor comes first, followed by a thorough analysis of the main obstacles to ERP implementation

- The selection of a successful ERP implementation roadmap from businesses that have successfully implemented ERP.

Table of Contents

CERTIFICATE	2
DECLARATION.....	3
ACKNOWLEDGEMENT	4
EXECUTIVE SUMMARY.....	5
1 INTRODUCTION.....	7
Problem Statement	8
Objective and Scope of the study.....	8
Background of the Project	10
2 Literature Review.....	23
3 RESEARCH METHODOLOGY.....	26
4 DATA ANALYSIS AND INTERPRETATION.....	28
Reference	49
Appendix I	51

1 INTRODUCTION

Brief Introduction

Capabilities that give an organization the foundation it needs to stand out from its rivals are the foundation of a competitive advantage. It is commonly acknowledged that the most crucial component for the survival and competitiveness of the majority of enterprises is information technology, or IT. A product's lack of availability might result in a loss of customers or sales since consumers can simply switch to another product when a product is unavailable. Only by manufacturing and transporting the appropriate goods in the appropriate quantity at the appropriate time can the product be made available in the market. Effective business performance depends on these calculations, which can only be guaranteed by proper supply chain management backed by information technology. Organizations are being forced to re-evaluate how they might use information technology (IT) skills to improve supply chain management or efficiency due to new emerging technologies, global contraction and competition, and rising customer demands.

Porter and Millar claim that IT offers chances for differentiation and has a significant impact on the expenses of the company. According to Porter and Millar (1985), there are three main ways that IT impacts competition in this context: by altering the industry's structure (a), generating a competitive advantage (b), and generating new employment opportunities (c). Strategic supply chain management (SCM) is the focus of modern aspects, where supply chains are utilized to improve company performance and generate competitive advantages (Ketchen et al., 2008). There is a chance to significantly restructure supply chain tactics thanks to the Enterprise Resource Planning "ERP" phenomenon. In 1970, Market Requirement Planning (MRP) was established, and Manufacturing Resource Planning (MRP) II was established in 1980, are both seen as building blocks of enterprise resource planning systems. Understanding the primary forces behind the ERP phenomenon, estimating costs and expected benefits, identifying the main obstacles to project deployment, and maintaining the software when it is fixed in place are the goals of recent ERP system study. Managers or stockholders who are currently working on such a large-scale project would benefit greatly from such an understanding.

The purpose of this study is to present how ERP can improve supply chain performance and to identify the circumstances in which ERP can either significantly improve supply chain performance or significantly impair it. ERP is the technology utilized to accomplish SCM, which is the word used to manage this accurate information coming in and going out mainly the item information. Since ERP performance is one of the primary organizational markers for success, a lot of work goes into enhancing and surpassing it. In order to help organizations this study helps in making decision to determine how ERP affects supply chain performance in the logistics industry or overall growth of the company.

Problem Statement

In order to ascertain if ERP is a crucial facilitator or a possible barrier to attaining operational excellence, this study will look at how ERP implementation affects supply chain performance. SCM depends on accurate data management, and ERP provides the technology foundation for accomplishing this goal. Since ERP performance is a crucial determinant of corporate success, it must be improved. This study examines how ERP affects supply chain performance in the logistics sector and offers recommendations for implementing IT best practices for the best supply chain results.

Objective and Scope of the study

Enterprise resource planning “ERP” and supply chain management “SCM” systems efficient way of gaining a competitive edge over competitors and enhance organizational performance. This study's primary objective is to examine the behaviour of ERP implementation on the SCM process mainly in gaining the competitive advantages.

The movement of raw material, goods and services from suppliers' factories or between warehouses or to end consumers is referred to as a supply chain. Planning, organizing, coordinating, and controlling every aspect of the supply chain's operations are the primary responsibilities of supply chain management “SCM”. Supply networks are the last frontier for cost reduction and competitive advantage after modern manufacturing reduced the production process's duration and cost. An

orderly and timely movement of goods from suppliers to consumers or distributors is the primary objective of supply chain management. Therefore, it should come as no surprise that transportation management, which is in charge of transferring completed items to the following link in the chain, has the discipline's deepest roots. Coordination of all supply chain links and activities is necessary for efficient inventory and supply chain management. The seamless and timely flow of resources and goods from suppliers to customers is made possible by effective coordination, which helps businesses maintain low inventories and save costs. Increased profitability and competitiveness are a result of all these advantages.

An essential component of effective supply chain strategy is information technology. Consider conventional supply chain tactics to comprehend the effects of information technology. Multiple production and storage facilities make up supply chains, which are extremely complicated systems. Suppliers of raw materials, producers of assemblies, distributors, and retailers make up a typical supply chain. It is frequently run in a decentralized fashion, meaning that each stage is run using data from its direct suppliers and consumers (decentralized information). Lead time for replenishment is been calculated based on the order submitted by its client and delivery time. By strengthening ties, an efficient supply chain is said to be the key to building a network of sustained competitiveness. One of the most fundamental aspects of the supply chain process is the ability to share information effectively and efficiently. By increasing these communications, supply chain companies will be able to make the right decisions to grow and optimize supply chain earnings. Information on the principles of supply chain development, such as expanding into new markets and areas and building new facilities, can be used in a variety of ways to achieve the best possible market performance. Planning and operational choices can be made with high efficiency thanks to information. Information technology, in particular, has altered how businesses communicate with their clients and suppliers. In order to respond quickly, for instance, suppliers leverage Point-of-Sales (POS) data from retailers to enhance their forecasts and more effectively manage inventory and production activities.

All supply chain operations and procedures are able to communicate with one another thanks to the information. By increasing these communications, supply chain

companies will be able to make the right decisions to grow and optimize supply chain earnings. Information on the principles of supply chain development, such as expanding into new markets and areas and building new facilities, can be used in a variety of ways to achieve the best possible market performance. Planning and operational choices can be made with high efficiency thanks to information. The accuracy and volume of information that businesses share with one another determines the supply chain's responsiveness and efficiency. Key fundamental aspects of the supply chain process is to communicate information effectively and timely. This includes information between direct partners as well as throughout the supply chain network by sharing information in interactive systems.

Background of the Project

Accessing real-time operational data across several departments and companies requires a supply chain management system. You may not be able to develop procedures that provide a sustained competitive advantage if you do not have a thorough understanding of the many activities and operational procedures that make up your supply chain. This problem has led to emerge of ERP as it helps in managing all the resources effectively. From placing sales orders to organizing shipment and post-purchase customer support, an ERP system offers a unified interface for handling all of the standard production tasks. Manufacturing and distribution companies can improve speed, efficiency, and customer happiness by integrating supply chain management with ERP, which gives them more insight into every aspect of their operations.

The main goal of ERP is to combine all divisions / departments and operations into a single system that can meet all of the demands of the business as well as regulatory needs. The information gathered and the macro-view of the company's current workflow and procedures can be utilized by firms who have already deployed an ERP. When it comes to choosing which system to deploy first, there are no hard-and-fast guidelines; instead, you must carefully analyse and consider your company's unique needs and circumstances before planning.

With significant advancements in IT and communication solutions, we may anticipate a change in the future when a variety of options for improved ERP system

interfaces will become available, ultimately leading to improved supply chain management. Therefore, the purpose of this study is to comprehend this ultimate capability in order to give managers working on ERP projects a more comprehensive viewpoint.

Supply Chain Management (SCM) System

They are intended to increase quality, reduce costs, and obtain a competitive advantage in a world. To optimize the use of available resources, all supply chain modules—planning, sourcing, manufacturing, shipping, and returns processing—are interconnected within the supply chain.

To optimize production and logistical management in traditional supply chain systems, big businesses found that vertically integrating supplier operations and distribution activities was advantageous. However, a lot of contemporary businesses rely significantly on suppliers and outsourced services that handle one or more production-related tasks. Concerns about timely delivery, quality control, and adherence to ethical business practices arise when crucial supply chain operations, such the distribution and acquisition of raw materials, are outsourced. The introduction of supply chain management addressed these issues.

- **History of SCM**

The cost of transferring items was a significant factor in determining the manufacturing and distribution of a commodity in ancient times, when transportation technology was primitive. As a result, products were assembled near the raw material source. After then, these goods traveled to their final customer in a mainly linear chain. It was developed about twenty years ago. The majority of businesses operated mostly independently of their suppliers prior to the 1980s (Susan, 2005). The supermarket industry's effective consumer response programs and the emergence of SCM as a quick response program (Lummus and Vokurka, 1999). In 1982, Wal-Mart installed scanners in every store and bar-code readers on every product.

Academic institutions had also started to acknowledge the importance of SCM by the late 1990s. A new department named Marketing and Supply Chain Management was created in 1997 when Michigan State University combined its Marketing and Logistics.

Supply chain management was once only thought of as a logistical network, but as competition grows, new competitors enter the market, alternative commodities become more common, organizations become less isolated, and businesses begin to operate internationally, its value grows. These days, companies are realizing that improved supply chain management can give them a competitive advantage. As a result, many people have recognized the importance of logistics and purchasing in supply chain management companies (Kanakamedala et al., 2003).

- **Conventional Procedure of SCM**

The four main nodes of a traditional supply chain are manufacturers, distributors, suppliers, and customers. Sometimes companies develop their own distribution departments or become their own distributors, which can lead to the distributor node being eliminated.

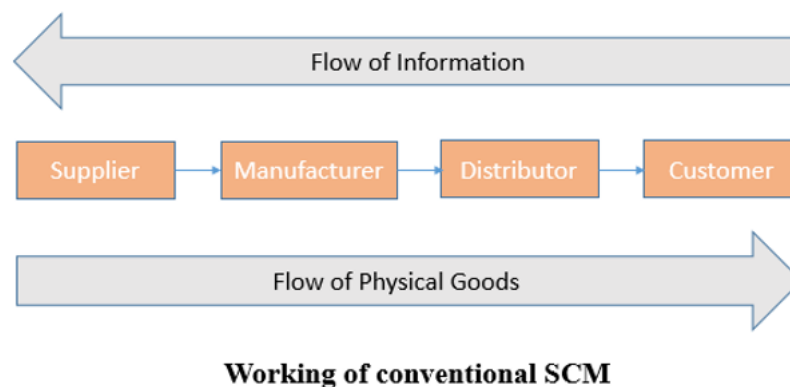


Figure 1.1: Basic Supply Chain Management Flow

First, the supplier provides the manufactures with raw materials based on the organization's quality and quantity requirements. Second, the producers make the goods in accordance with the specifications of the clients, package them, and provide them to the distributors for market distribution. Physical items continue to move in this manner from the source to the producer, distributor, and final consumer. Manufacturers modified their goods in response to consumer demands and requested, if required, raw material modifications from suppliers. The data aids in producing goods and rendering services in accordance with the needs of the client. The accompanying figure illustrates how time-consuming the sequential flow of information.

○ Defining SCM

The phrase "supply chain," which is now widely used globally, "includes all of the work that goes into creating and delivering a finished good or service, from the supplier's supplier to the customer's customer" (SCC, 2005). Thus, supply chain management, or "SCM," is the collection of practices used to monitor the full distribution channel flow from a supplier to the end user. "The coordinated flow of materials and products across the enterprise and with trading partners" is how supply chain management is defined. Work flow, financial flow, and information flow management are also included, though. As part of supply chain management, raw materials, work-in-progress inventory, and finished goods are transported from the origin point to consumption.

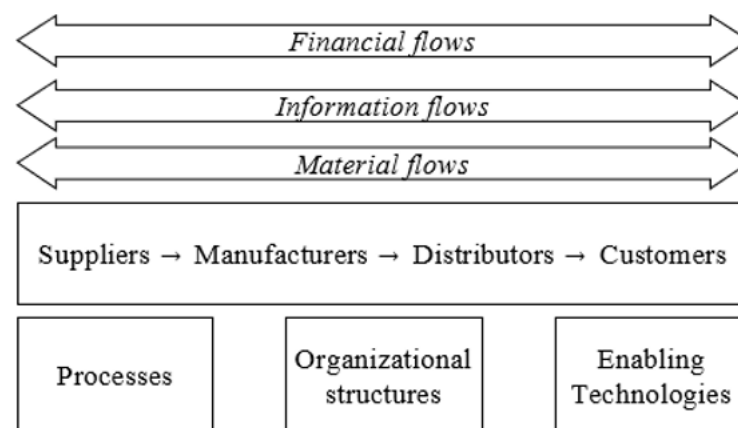


Figure 1.2: Model of the Supply Chain

Three primary flows can be distinguished in supply chain management:

- Materials Flow
- Information Flow
- Funds movement

The information flow includes updates on delivery progress and order transmission. The financial flow consists of payment schedules and payment related information.

Three pillars in turn sustain the network are as under:

- Procedures
- Structures of organizations

- Enabling technologies

Technologies that enable procedures that integrate the companies.

- **Technology affecting the SCM**

Describing the ways that supply chain technology helps companies manage communication amongst supply chain members. Businesses were limited by their inability to send and receive updates, comments. Personal computers sparked a revolution in logistics in the 1980s, leading to notable advancements in supply chain management. Planning advanced with previously unheard-of graphical user interfaces as computer access increased. The advent of new technologies such as adaptable spreadsheets and interfaces based on maps greatly enhanced the technology used for logistics planning and execution.

- **Changes in SCM**

Sharing information is essential to the supply chain's (SC) smooth operation. Technologies like the internet and web can be used by organizations to improve efficient communication. Every supply chain participant can benefit from internet-based software that analyses historical performance, tracks present performance, and forecasts when and how many specific commodities will need to be produced. We can reduce the cost of SCM with the use of the internet, keeping in mind that firms occasionally need to alter their procedures in order to integrate the technology. Though it greatly relies on how it is implemented. Businesses now conduct their operations differently thanks to the internet (Short, 2002). These days, a lot of companies offer supply chain management software. Generally speaking, the fundamental concept behind putting these solutions into practice in the industry is to create a combined shared database that facilitates quick and simple information sharing amongst the links on the SCM, as seen in the following figure:

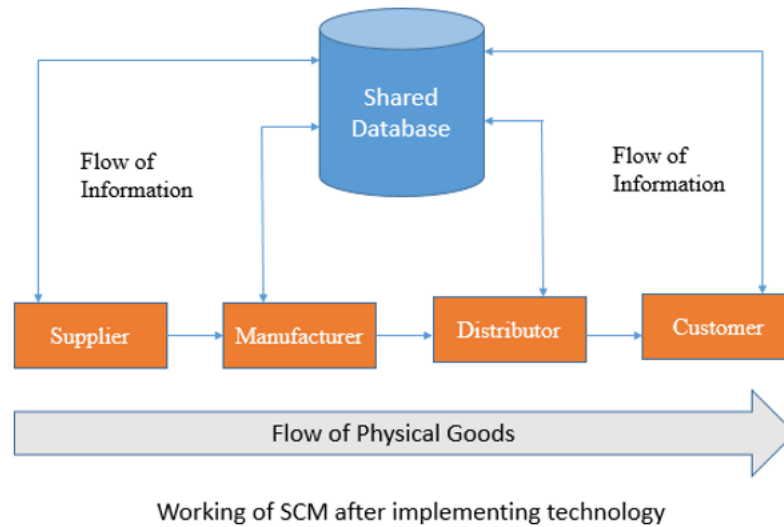


Figure 1.3: SCM Implementation

For the majority of businesses, the Internet appears to be an additional distribution channel. The operations of the entire supply chain can be significantly aided by the Internet and Web technology. Online supply chain management is quick and affordable. Additionally, clients only need to click the mouse on their computer to rapidly check the status of their orders. Suppliers and distributors, as well as corporate executives and managers, have real-time access to the company's inventory level (David et al., 2004).

These systems aim to improve the performance of all stakeholders by coordinating plans and operations both within and between businesses. Because supply chain management systems connect multiple organizational branches, each system is unique and needs to be adjusted to function properly. Integrity can be added to a supply chain's operations by using logistics software to run remote diagnostics.

Enterprise Resource Planning (ERP) System

The Enterprise Resource Planning (or "ERP") System which provides a complete solution for the business for different industries for example, might utilize separate systems for accounting, human resources, order management, and procurement, with each system maintaining its own data source. These would be integrated into a unified system by ERP.

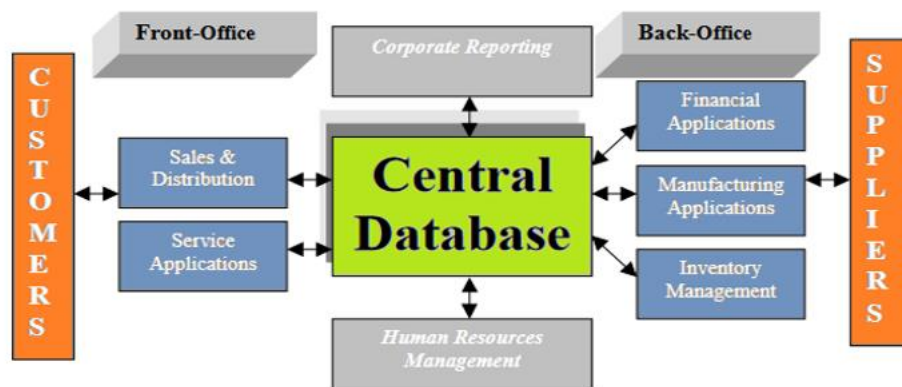


Figure 1.4: ERP Model

Researchers have determined that the primary source of supply chain information distortions and delays is information system fragmentation. Information delays and distortions lead to the well-known bullwhip phenomena. Reducing delays and eliminating information distortions are two ways that an ERP system can increase supply chain transparency. Thus, there is reason to believe that significant increases in supply chain efficiency could be associated with the deployment of ERP.

- **What is ERP?**

The abbreviation ERP stands for enterprise resource planning. ERP is the software which helps in providing ease to the business. The software's architecture promotes transparent integration of modules and allows for a consistent flow of information among all company processes. With the aid of ERPs and corporate computing, businesses can substitute or redesign their legacy information systems—which are mostly incompatible—into one unified system.

- **Evolution of ERP Systems**

From a technical standpoint, ERP is a natural evolution of the Material Requirements Planning and Manufacturing Resource Planning (MRP II) systems developed in the 1970s and 1980s. Nonetheless, the impact of ERP has been considerably greater. The ERP phenomenon began in 1972 when a team of engineers from IBM created a program for ICI Chemicals that integrated materials management with sales and distribution. Over the subsequent two decades, about 4,300 copies of the bundle were sold without any marketing initiatives. ERP companies created extended ERPs by adding other features and modules to the core modules.



Figure 1.5: ERP Extension

With a third of the market, SAP currently controls the ERP sector. Indeed, a "ERP ecosystem" is frequently discussed, which includes IT service providers, hardware producers, consulting firms, ERP software developers, and specialist software developers. On the other hand, it is projected that global sales of ERP packages and implementation support will surpass \$20 billion by the year 2000, with yearly growth rates exceeding 30%.

- **ERP Tools**

Famous among the numerous firms that manufacture ERP software are SAP, Oracle Corporation, PeopleSoft, JD Edwards, Lawson, and others. SAP dominates the ERP market with the largest share, while Oracle Corporation follows in second place. Oracle is in a fierce competition with SAP and has made acquisitions of JD Edwards, PeopleSoft, and Siebel. While only a few companies are focusing on specific sectors, top ERP software like SAP and Oracle Apps serves all business functions. Below is the list of vendors for the widely recognized ERP tools.

ERP Tools	Name of Vendor
Sap R/3	SAP
Oracle e-Business Suite	Oracle Corporation
PeopleSoft	Oracle Corporation
JD Edwards EnterpriseOne	Oracle Corporation
Microsoft Dynamics	Microsoft Corporation
Lawson Financials	Lawson Software
Sage MAS 500	Sage Group
NetERP	NetSuite
Visual Enterprise	Infor Global Solutions
Agresso Business World	Unit 4 Agresso
Epicor Enterprise	Epicor
IFS Applications	Industrial and Financial Systems
MFG/PRO	QAD
Ramco e.Applications	Ramco Systems

Table 1.1: ERP Tools

○ ERP Market Growth

ERP has been expanding annually since 1970, with a 30% annual growth rate in the market. This expansion has numerous causes, including the following:

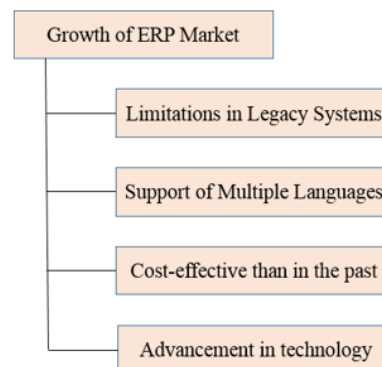


Figure 1.6: ERP Growth

Limitations in Legacy Systems

Organizations may encounter issues with legacy systems, or outdated systems that are still in use. In addition to being slow, ineffective, and occasionally expensive to maintain, they are unable to generate the output that a company might require in order. ERP may address the issue by highlighting the data required to create a practical and sustainable solution. Businesses today must abandon their outdated ERP software and switch to modern ERP software that can handle all of their current needs due to the spread nature of firms and the advancement of technology. As a

result, management will realize that the legacy systems cannot produce the necessary results or operate efficiently.

Advantages of ERP over legacy system

- Multiple Languages and Currencies support
- Multiple ledger
- Cost-effective than in the past
- Advancement in technology

ERP Life Cycle

An ERP Implementation life cycle refers to the various stages involved in executing ERP implementation within an organization. The steps involved are generally as follows:

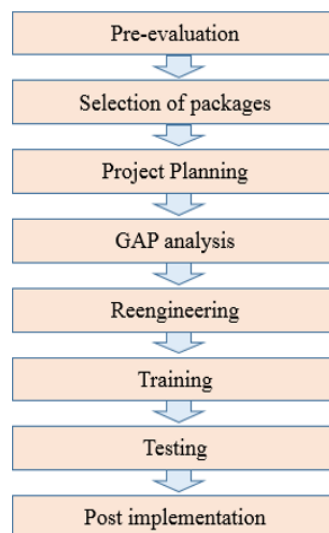


Figure 1.7: ERP Life cycle

- **Pre-evaluation of ERP**

Once business has decided to go for the ERP implementation they have to select the ERP system which could be used to meet their business requirements. ERP programs that fail to satisfy the company's requirements are eliminated

- **Selection of packages**

ERP solutions that are deemed unsuitable are removed throughout the selection process. Careful selection and testimonies are required for the product. The ERP

implementation's success will depend on the decision made. A comprehensive examination and investigation should be carried out before the choice is made. After the identification of the packages to be assessed, the business must establish selection criteria that allow for an equal evaluation of each package.

Project Planning

The project's implementation procedure needs to be well planned and designed. Roles are determined, duties are delegated, and the plan is created. It will also determine when the project should start, how to proceed, and when it should be finished.

- **GAP analysis**

As we have to choose correct ERP system we need to prepare the GAP analyse in order to understand how much business requirements are been satisfied. According to the report 80% business requirements re only fulfilled by any ERP system.

- **Reengineering**

This phase involves taking human considerations into account. Even though every implementation will lead to significant changes in personnel numbers and job responsibilities due to increased automation and efficiency, ERP should be seen as both an investment and a cost-reduction strategy. This stage is intended to boost the business process's efficiency.

- **Training**

The implementation phase marks the beginning of staff training in the ERP implementation life cycle. For the new system to work properly in the future, workers need to adapt to it. Thus, it is essential for the company to choose employees who have the right mindset—those who are receptive to change, enthusiastic about learning new things, comfortable with technology, and possess strong functional expertise.

- **Testing**

Testing is an essential step taken before the actual application process to identify and correct any errors. With the system now established, you need to consider extreme

situations such as system overloads, simultaneous logins, incorrect user inputs, hackers trying to breach secure areas, and similar occurrences.

- **Post implementation**

To learn best practices, it is essential that managers and employees are properly trained after deployment and integration. The system needs to be revised in order to incorporate the latest technological advancements. If an organization manages to adopt and utilize the system effectively, it can derive maximum benefit from these inputs.

ERP Integration

An integral component of ERPs is integration. ERP's primary objective is to combine data and procedures from all departments inside a company for convenient access and workflow. ERPs typically achieve integration by building a single database that uses several software modules to provide distinct business activities to different parts of an organization. Ideally we should have only one ERP system implemented in an organization to support the business but as one ERP is not able to cater to all the business requirements company goes with other tools or system. A setup like this usually requires a lot of labor hours and can be time-consuming.

- **Various Modules of ERP**

Numerous software modules make up ERP software. Every ERP software module replicates a key organizational function. ERP should ideally provide a single database with all of the information for the software modules, such as:

- Manufacturing
- Supply chain management
- Financials
- Project management
- Human resources
- Customer relationship management
- Access control
- Customization

2 Literature Review

According to Chandra and Grabis (2007), a supply chain is a network of manufacturers, distributors, retailers, warehouses, and suppliers who work together to transform raw materials into completed commodities. The creation of a suggested path model and theories derived from the literature are the main objectives of this work. The more comprehensive SCM software includes Enterprise Resource Planning “ERP” solutions. ERP systems are used to standardize, organize, and codify business processes and data in order to combine them (Norris et al., 2000). For this reason, it is anticipated that ERP will directly and favourably affect SCM. Chesborough and Teece (1996), Downes and Mui (1998), Malone and Laubacher (1998), Porter (1998), Tayur et al. (1998), and Hagel and Singer (1999) are only a few examples of the fast-expanding body of work on new business models for the Internet age.

Examining the relation between SCM system, ERP systems, business performance, and competitive advantage is the aim of this research. Implementing SCM solutions is necessary for a corporation to become more flexible and efficient. Competitive advantage and organizational performance are positively impacted by SCM methods. ERP and SCM systems are useful instruments that improve business performance and give an ongoing competitive edge (Li et al., 2006). ERP systems facilitate information use and improve working circumstances (Mzoughi et al., 2008). Around the world, enterprise resource planning is regarded as a highly regarded corporate activity. Wonderful ancillary benefits are linked to this method, such as enhancing customer service, increasing production capacity, and lowering overhead expenses related to production operations. This business resource planning system has been viewed as a complicated and dangerous system despite all of these advantages (Keskinocak & Tayur, 2001; Zhang, Lee, Zhang & Anerjee, 2003).

Numerous scholars examine the connection between company performance and supply chain management methods (Mzoughi et al., 2008; Li et al., 2006). Ie-Ray (2003) found that because ERP systems can automate company operations and adapt to changes, they enhance SCM competences as well as customer responsiveness and satisfaction. Businesses and organizations worldwide are greatly impacted by ERP

systems (Cook, Heiser, & Sengupta, 2011; Jain & Benyoucef, 2008 ; Janvier-James, 2011).

Every business has financial and marketing goals, and they constantly strive to meet them. Additionally, businesses can obtain a competitive edge by cultivating a strategic relationship orientation that prioritizes reciprocal advantages and preserving connections with a small number of suppliers (Chen and Paulraj, 2004). According to Zhang, Donk, and Vaart (2011), the majority of firms implement ERP systems in order to enhance their management, strategy achievement, IT and infrastructure, operations, and, eventually, their business.

Enterprise resource planning has been regarded as the most important component of information technology robustness, according to Devenport (1998). According to Nah and Lau (2001), Ruivo, Oliveira, Johansson, and Neto (2013), and Zhou-Sivunen (2005), this ERP system can be viewed as software that connects all business processes and offers coherence amongst all business activities. It also includes a variety of modules, such as sales and finance, production, and human resources. ERP systems, according to Al-Fawaz, Al-Salti, and Eldabi (2008), Hwang and Min (2013), Wieder, Booth, Matolcsy, and Ossimitz (2006), provide coherence and linkages between distributors and suppliers as well as between customers with a shared data infrastructure.

ERP systems goal is supply chain efficiency, however in addition to the fundamental effects of ERP, the supply chain has a number of variables that may affect its effectiveness. According to Hemistocleous, Irani, and Love (2004) and Malik, Saif, Gomez, Khan, and Hussain (2010), a typical supply chain consists of four levels, with many facilities at each level: supply, manufacturing, distribution, and consumer.

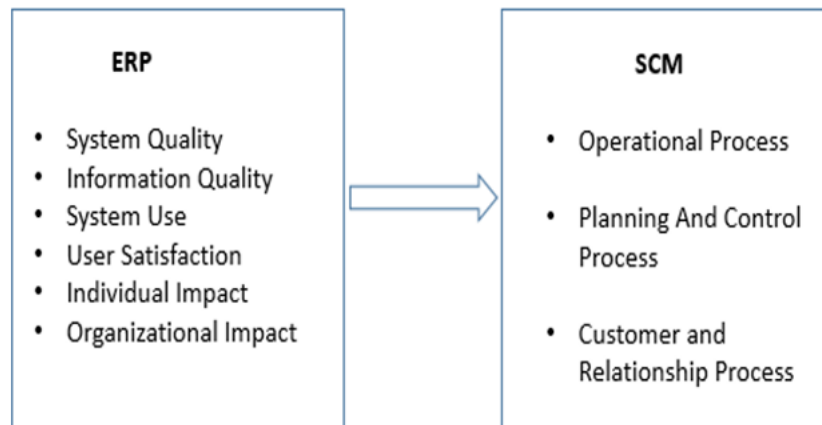


Figure 2.1: ERP input to SCM

Given the aforementioned considerations, it is clear that a system viewpoint is used in this work, with ERP seen as a crucial input and SCM as a crucial procedure. Figure 2.1 shows the research structure developed for this study in accordance with the examined literature.

3 RESEARCH METHODOLOGY

Research methodology constitutes one tactic for addressing research problems. It might be seen as a discipline that examines methods of scientific investigation. A multitude of studies have examined ERP and its implementation advantages. In conjunction with the data collection, both primary and secondary data were utilized. Data collection involves interviews, questionnaires, observations, periodicals, booklets, and the internet.

A key benefit of ERP is that all company data is collected at the moment of the initial transaction, processed and stored in a central location, and updated in real time. Consequently, this enhances the firm's ability to capitalize on market opportunities and the quality of decision-making. Profitability is increased while information transfer costs and opportunity costs brought on by bad decisions are decreased. Second, ERP enables the automation and standardization of company processes and electronically monitors employee accountability. This makes the management process more visible, boosts efficiency, lowers monitoring expenses and human mistake, and facilitates the firm's governance.

When combined, ERP systems can lower expenses while increasing profitability for the company. Therefore, the following theory is put forth:

- The implementation of ERP results in enhancements to the performance of Supply Chain Management.

This research is exploratory in nature. Both primary and secondary sources provided the data and other information needed for the investigation. Primary data are those that are recently gathered from the initial source and are unique in nature. Questioners, observations, and surveys created with electronic mail survey techniques are used to gather primary data. The purpose of these studies was to ascertain how the Supply Chain Management "SCM" System was affected by Enterprise Resource Planning "ERP".

Primary research based on structured, detailed surveys was conducted with key respondents who took part in the implementation of Extended ERP and were directly engaged in daily operations. The electronic mail surveys used to collect data included participation from twenty-three representatives across seventeen organizations

involved in the ERP post-implementation phase, as well as a consultant with about ten years of experience in ERP implementations and post-implementations at various large companies involving multiple ERP vendors. The surveys consisted of twelve open-ended questions regarding ERP systems and their impact on the supply chain. The surveys collected information about the organization's size, revenue, and ERP vendor. Below is a list of the primary questions from the survey:

- Are organizations fulfilling the aims, targets, and anticipations of their ERP implementation?
- Has the ERP enhanced transparency in the supply chain?
- Has the functionality of the supply chain improved with the ERP?
- Has the logistics process improved due to the ERP?

Previously prepared secondary data, including periodicals, booklets, journals, websites, and so on. The research study utilized the existing literature on the current study genres. The literature on supply chain management (“SCM”) and enterprise resource planning (“ERP”) is assessed separately.

4 DATA ANALYSIS AND INTERPRETATION

Data collection sources/techniques

The purpose of this research is to determine how enterprise resource planning (ERP) affects the supply chain management (SCM) system. This research aims to establish the advantages of an Enterprise Resource Planning (ERP) system for resolving various challenges encountered by supply chain management organizations. To this end, relevant literature is examined, and strategies are devised to collect and analyse information about different involved areas in order to ascertain the facts.

Additionally, the methods used to collect data vary depending on the stage of the study. For example, in the pilot phase, experts are interviewed to update and localize the questionnaire before it is distributed to the target companies. Both qualitative and quantitative approaches are so used. They distribute a self-administered survey. Reduced costs, sample availability, and thoughtful deliberation Some advantages of this strategy are that "respondents can take more time to gather facts". The questionnaire covers the following topics: ERP Integration Benefits, ERP Performance, System Implementation, and Company Profile. The first section contains the respondent's position inside the organization as well as demographic information about the company. The second section discusses the ERP system's implementation and accessibility throughout the organization. The last section covers the advantages of combining ERP with the current supply chain management system. The previous section focused on the effects of supply chain integration and enterprise resource planning (ERP) on performance.

- **Distribution of the study sample**

The study sample's distribution is displayed below:

Variable	Category	Frequency	Percentage(%)
Gender	Male	21	87.5
	Female	3	12.5
Managerial category	General manage	1	4.16
	Deputy manager	1	4.16
	Logistic Department Managers	14	58.3
	Warehouse Manages	4	16.6
	Functional Department Staffs	4	16.6
Age of industrial company	Less than 5 years	13	54.16
	From 5 to less than 10 years	8	33.33
	10 years and above	3	12.5
The company's target markets	Local market	5	20.8
	International market	8	33.33
	Local and international markets	11	45.83
Size of industrial company	High	1	4.16
	Medium	15	62.5
	Small	8	33.33
No. of employees	Less than 10	2	8.33
	10 to less than 25	8	33.33
	25 to less than 50	9	37.5
	50 and above	5	2.8

Table 4.1: Sample Data

Details regarding the respondent department are documented in the second section of the study questionnaire. The pie chart below shows the proportion of different types of companies that respondents belong to. 58.3% of the respondents were managers in the logistics department. In second place are warehouse managers, at 16.6%, and in third are functional department staff, also at 16.6%.

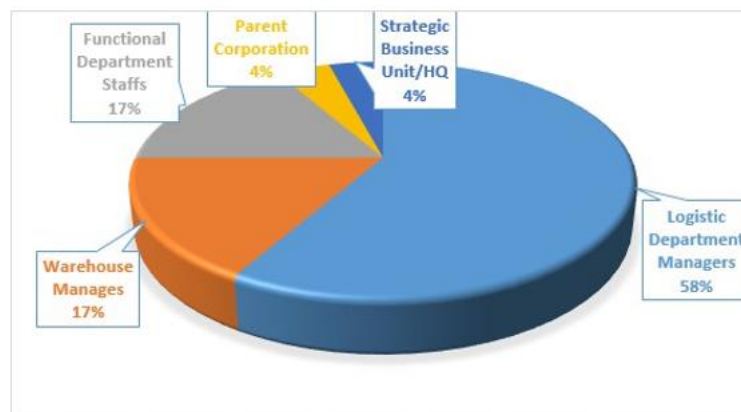


Figure 4.1: Department wise Details

○ ERP system implementation and access

Implementation and accessibility of ERP systems According to the report, businesses are become increasingly conscious of the advantages of IT integration for their

enterprise. In this sense, implementing ERP and other similar systems is becoming more and more common, particularly as businesses begin to grow and become larger organizations.

Industry	ERP Not Implemented in Industries	ERP Implemented in Industries	ERP Implementation Percentage (%)
SCM Organizations	7	17	71%

Table 4.2: ERP Implementation in SCM Organization

According to the analysis, 17 enterprises, or 71% of the respondents, had deployed some ERP system components (see table 1). Eleven of these companies, or roughly 65% of them, have selected the "InHouseDevelopment" option, indicating that they have created and constructed their own ERP system from the ground up or in response to requests for new modules. As shown in table 5.2, SAP ranks first among renowned manufacturers with a share of 23% (4 companies), while Oracle holds 12% (2 companies).

ERP Vendors	No	Percentage (%)
<u>InHouseDevelopment</u>	11	65%
SAP	4	23%
Oracle	2	12%
Total	17	100%

Table 4.3: Selection of Implemented ERP systems

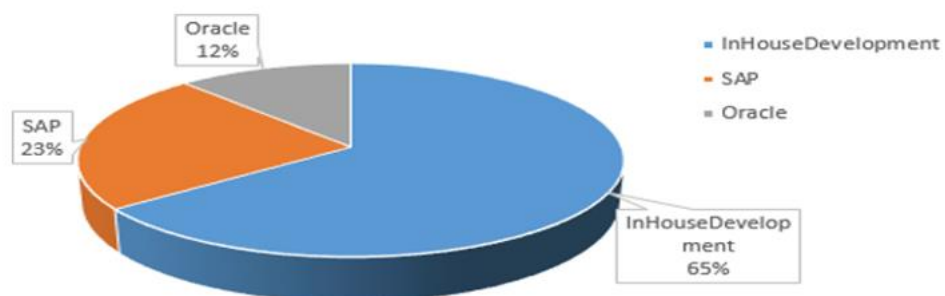


Figure 4.2: ERP Vendors

Since every company that has implemented ERP has also implemented Accounting, it is the most crucial module. Human Resource Management “HRM) comes in

second with over 83%. Forecasting, warehousing, customer relations, logistics, and human resources are other popular modules that the respondent's companies use (see table 5.4). Furthermore, data is gathered to determine if companies within the supply chain offer their customers or suppliers online access.

Module Implementation	YES	NO	TOTAL
Accounting	17 (100%)	0 (0%)	17 (100%)
Human Resource Management	14 (83%)	3 (17%)	17 (100%)
Logistics	12 (71%)	5 (29%)	17 (100%)
CRM	10 (59%)	7 (41%)	17 (100%)
Warehouse	10 (59%)	7 (41%)	17 (100%)
Forecasting	6 (35%)	11 (65%)	17 (100%)

Table 4.4: ERP Module Implementation

Generally, there are several key identifying factors that assist with ERP assessment. This examination is one of the crucial steps in choosing an ERP solution that could be suitable for a company or organization. For instance, business functionality is regarded as an essential indicator of a dependable and effective ERP software solution. It establishes how adaptable and successful the ERP software is at handling a specific industry. ERP system implementation is a challenging task. The expense of hiring people to install and customize the program is much more than the cost of the product itself. Consulting services based on ERP package implementation are provided by both ERP vendors and reputed top consulting firms. The risk of implementation and the possibility of cost overruns should be assumed by the vendor.

Even though all companies (71%, 17 out of 24) implemented ERP for strategic purposes and are committed to a continuous business improvement program. Despite all the firms citing the use of ERP to implement best practices and optimize processes, only one claimed it had provided them with a competitive advantage in their industry. What is your level of satisfaction regarding the present integration of your supply chain management ERP system? The pie chart that follows displays the results. Approximately 70% (12 of the 17 organizations surveyed) reported being "very satisfied" with this approach.

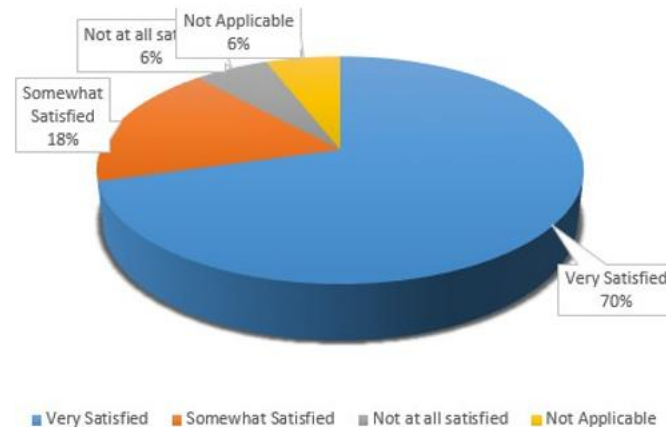


Figure 4.3: Company Satisfaction

The ERP implementation endeavour has affected two aspects of businesses that have successfully finished the process. Operationally, the customer interface is said to have been enhanced by the capacity to get transactional data instantly. By eliminating IT fragmentation, collaboration among various functions has become more effective, resulting in enhancements to customer service with respect to timely information, fulfilment of orders as scheduled, and delivery of orders as scheduled, as demonstrated by the accompanying table.

Impact on Operations	Avg. Score	Std. Dev
Provide customer with required information	5.5	0.9
Different functions working together effectively	5.4	0.6
Improved customer response time	5.1	1.0
Higher percentage of orders completed on time	5.0	1.0
Reduced inventory levels	4.9	1.1
Improved ability to switch among products	4.6	0.7

Table 4.5: Operational Impact

Its firm's characteristics of low volume and high value account for the exception, even though it could optimize its financial supply chain like others do. Although it can be achieved in a relatively uncomplicated manner, only one organization has provided online access to clients and suppliers. The corporations have not yet implemented this facility, even though they are aware of its benefits. It was clear, in fact, that if one corporation did this, it could get ahead of its rivals very rapidly.

Regarding the ERP initiative's organizational impact, most respondents are pleased with the deployment timeline and hopeful that the new system will ultimately live up to their expectations. However, few people think that the ERP deployment has had a

major impact on the organizational structure. This paradox begs the question of whether businesses were unable to take full advantage of a significant chance for transformation. It's also important to remember that ERP was seen as an essential attempt to keep up with rivals.

Impact on Organization	Avg Score	Std Dev
ERP will eventually satisfy our expectations	5.2	1.0
IT change was vital for performance change	5.1	1.1
ERP has made it possible to stay even with competitors	4.8	1.2
Implementation progress is satisfactory	4.6	1.4
Implementation is proceeding on schedule	4.0	1.6

Table 4.6: Organizational Impact

The following categories are always affected by the deployment of ERP.

- Enhance the collaboration between departments at all levels; standardization and integration make it easier to communicate and coordinate efforts.
- Facilitating the centralization of administrative tasks like accounting and finance.
- Reduce the cost of maintaining information systems and enhance the ability to add new features.
- Lower operating expenses and boost productivity
- Improved visibility of transactions throughout the company and the capacity to adjust to new rules and regulations and handle future business developments would help the company compete more successfully.
- Improve your business choices.
- ERP aids a business in moving from ineffective operational methods to established practices. Galbraith (1974).

The aforementioned literature indicates that ERP systems can offer potential advantages for organizations when implemented successfully.

Data Analysis

It was discovered that user reluctance and trust stood in the way of attaining transparency and utilizing the ERP system's full potential. One interviewee claimed that although the ERP increased the organization's functionality and openness, not all employees were eager to use the program. According to the same respondent, the administration appears to have little faith in its employees, allowing users of the system very little access.

ERP systems are provided by a number of companies. A closer look would show that each product differs more from the others. Despite their apparent functional similarities, these items differ significantly in terms of internal operations and design. The majority of businesses choose vendors who are well-liked in the market, which is a poor decision. Since cost is the deciding factor for the majority of industries, they might base their software choice on it. ERP evaluation is not possible with such factors.

- **ERP Impact**

This study aims to investigate the effects and benefits of ERP on SCM organizations more thoroughly. Based on the survey and selected literature, this study organizes the advantages of ERP into six components and concludes that they have the potential to improve company competencies in supply chain management (SCM). These include advantages related to strategic IT planning, business processes and management, operations, planning and control processes, as well as customer relations.

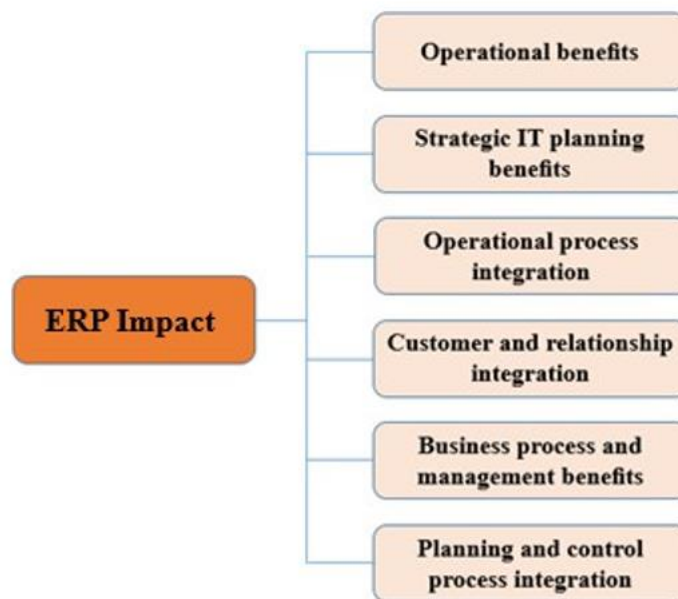


Figure 4.4: Impact of ERP in the SCM system

Performance Impact in	Mean	St. Deviation
Operational benefits	3.29	1.4
Strategic IT planning benefits	3.23	1.56
Operational process integration	4.11	1.21
Business process and management benefits	1.64	0.78
Customer and relationship integration	3.23	0.90
Planning and control process integration	2.88	1.16

Table 4.7: ERP benefits contribute to firm competence of SCM

- **ERP Process Improvement**

To understand the outcomes of ERP integration in the supply chain, the last item in the questionnaire requests that respondents rate their improvement. Overall, as shown in table 4, every company that has adopted IT (71% of all enterprises) has advanced in all areas. This is a significant outcome since the accomplishments, particularly in the metrics with scores higher than "four" on a five-point scale, may persuade other businesses to integrate them into their supply chain system.

Process Improvement in	Mean	St. Deviation
Order Fulfilment Lead Time	4.04	0.84
Order Fill Rate	4.36	0.49
Total Logistics Cost	3.68	0.48
Return Processing Cost	3.72	0.98
Inventories Days of Supply / Inventory turnover	4.68	0.48
on Time Delivery	4.36	0.95
Rate of Return	3.64	0.49

Table 4.8: Performance improvement in Supply Chain Organizations

Finding & Recommendation

The main aim of this research is to identify the advantages of ERP systems in dealing with the various supply chain management (SCM) problems that companies may encounter. The possible advantages of Internet technologies for supply chain management are vast. Companies can now exchange data with their partners without the need for dial-up connections or private carrier networks. Thanks to the Internet, the supply chain has evolved into a network of interconnected organizations instead of a horizontal structure.

ERP solutions can be implemented in a variety of ways to benefit SCM organizations. The choices are numerous and include both internal and exterior interactions. ERP can give businesses a competitive edge, but doing so requires them to start an ongoing process of learning and improvement. Businesses who don't follow this path will eventually fall behind their rivals due to "competitive convergence." The research shows that while extended ERP is of great interest, it is approached with caution.

It takes more than just installing a new application to extend to a new ERP solution. Organizations that opt for this route should consider the following challenges. To take advantage of the new technology, it is necessary to review and adjust internal or external business processes as required. Second, a successful communication and change management program needs to be implemented. Thirdly, it's important to review the lessons acquired from the initial ERP implementation to make sure that the same mistakes aren't done again. Lastly, a solid business case that includes specific goals and essential success elements must be created.

- **Selection of ERP Vendor**

The choice of ERP vendor will be crucial if a company has made the decision to install an ERP system in its workplace. There are several factors and several points of decision. Where should I start? What are the primary selection criteria that you and your team should be aware of before starting? Supporting the objectives of the organization is the main justification for switching to a new ERP system. Every company has its own goals. An enterprise would typically wish to compare the numerous vendor options that are accessible, such as SAP, Oracle, Microsoft, and so on.

Before making a final choice, it is necessary to do some comparison shopping and examine a number of packages. You should select the provider who is most enthusiastic about meeting your business and personal needs. They should be capable of modifying and adjusting their software to acquire the modules necessary for the company. If the company lacks clarity on selecting an ERP vendor, it may be beneficial to look into different consultants who focus on this type of work.

A consultant will help you to clarify your exact needs, identify effective implementation strategies, and determine which available programs and vendors can meet your company's requirements. After you have done as much research as you can on each vendor and their offerings, you should choose an ERP vendor. Additionally, since open source programs could give you the freedom you desire, the company should check into open source ERP providers. The majority of ERP systems are based on the Internet, making them ideal for businesses of all sizes and those operating globally.

Because most ERP systems are based on the Internet, they are ideal for businesses of all sizes and in different locations. By consolidating all the data into a single, easily accessible database, all departments can access nearly all information stored at your location, except for the most sensitive data. Due to its straightforward setup, it is compatible with most other accounting software and necessitates minimal to no IT upkeep.

Application hosting schemes have been launched by all of the main ERP vendors. Some are running more than one program at the same time. As a result, public-sector

businesses usually have a variety of options when it comes to not just the software that best suits their requirements but also the application hosting program that they like. Application hosting costs can be broken down into three categories: software, processing, and implementation. Software can be purchased on a monthly or per-user basis. This pricing structure or one based on the actual transactions performed can likewise be used for processing services. Although they might be spread out over several years, implementation services are often paid for in full. For elected officials who want to avoid large upfront financial outlays, the idea of "rent your software; don't buy it" has genuine appeal. This benefit is somewhat deceptive, though, as the implementation costs of SAP and Oracle ERP Systems are usually at least twice (and often even five times) higher than those of the basic software. You must re-implement if you wish to switch software vendors.

Nonetheless, it is believed that the long-term benefit of having to manage only one supplier and maintain only one technology in order to achieve a truly integrated system outweighs the costs. The application hosting of SAP Oracle ERP Systems provides medium and smaller public entities with a crucial advantage: they can utilize the functionality and capacity of comprehensive administrative and financial systems at a cost that is only a small portion of what it would take to create and sustain these systems independently.

The crucial functionality needed, the ability of an internal IT team to manage several platforms and systems, and the challenge of working with multiple system vendors rather than a single major source are the main deciding considerations. All businesses can gain from enterprise resource planning (ERP) solutions, which have the potential to influence every facet of your company. These highly sought-after enterprise tools assist with tasks such as planning, R&D, purchasing, supply chain management, sales, and marketing. Given the multitude of ERP options available, it is essential to choose the one that aligns most closely with your company's needs.

- **Major Challenges to ERP Implementation**

If ERP adoption is not done correctly, it can be a stressful process. What causes ERP implementations to fail, then? Failure typically entails halting orders and/or manufacturing, going well over budget, severely altering the release date, or failing to provide the expected return on investment. The following lists the actual causes of

ERP system failures together with practical suggestions to guarantee a successful deployment.

- Objective is unclear
- Resistance in change
- Wrong resource estimate
- Less testing
- Adoption or train on the new ERP
- Incorrect Solution Chosen
- Over-Expectation

Objective is unclear

Lack of a clear goal is a fairly typical error made by the majority of firms considering ERP installation. The final outcome will be ambiguous if the expected success, the issues to be addressed, and the anticipated financial rewards are not precisely and unambiguously defined. A clear goal entails outlining the crucial business procedures, monetary gains, and due dates in advance and getting certain stakeholders to agree on how to handle them. The end goal becomes a changing target in the absence of a clear definition of success. First, the question of whether your organization needs an ERP should be resolved.

Resistance in Change

Resistance to change can stem from a variety of factors, most commonly fear. They can be concerned that they won't be able to pick up the new ERP system or that their jobs are in danger (due to automation). Some people might simply be terrified of the new system's technical features. Training is the solution, regardless of the cause. Allow them to demonstrate how the new method will help them personally. They might be less anxious because they can easily access all the information they require; which could solve this problem.

Wrong resource estimate

The most frequent errors occur when resources are projected. It is essential to have a thorough awareness of resources required to finish the ERP project which can include anything. A crucial aspect of internal resources that is often neglected is the time commitment needed from business users, as they must provide the requirements and access to ensure the configuration aligns with their business needs. It is

frequently required to bring in temporary staff in order to backfill the majority of transactional employees during crucial deployment phases. This gives the new system's users more time for training and installation. It's crucial to have a clear understanding with your consultants regarding the time, SME (subject matter expert), and amount of external resources required.

Less testing

It ought to be viewed as a step of correction. One of the first things that frequently gets trimmed when time becomes limited is the quantity and complexity of test cycles. Software functionality is not the goal of while doing implementing ERP project. The goal is to determine whether the ERP application satisfies your business requirements and yields the desired outcome. Cutting back on testing doesn't necessarily mean that flaws won't be found, but it does raise the possibility that the ERP system will be lacking crucial features or that end users won't like it.

Adoption or Train on the new ERP

It is a difficult task to train hundreds or thousands of users at the right moment. When training is confined to a brief period at the project's conclusion, users find it very difficult to acquire the requisite training to comprehend the system and generate a favourable initial impression during the rollout. While it is essential to have the right technology set up, it becomes futile if individuals do not possess the required expertise to utilize it. Whether you want to train all of your staff or just a select few and then have them train the others, you can rely on the ERP vendor's training choices.

Incorrect Solution Chosen

Another issue that people may face is selecting the incorrect ERP solution as we have lot of possibilities to achieve the business requirements. If a merchant says, "Yes, we do that," don't be fooled. Get Them to Show You! Before attempting to deploy the ERP solution in the company, it is preferable to carefully select it with the help of a reputable expert.

Over Expectations

Despite facts to the contrary, ERP providers frequently claim that their ERP solution can be deployed fast and affordably. For instance, a small-to-mid-sized business's implementation typically takes 16 months, yet suppliers sometimes claim they can finish it in as little as 8. A hurried implementation, additional expenses, and resources are also brought about by these impractical time estimations. ERP adoption fails for a number of reasons, including these. Any new ERP system's main component is training; thus, the company should take care to ensure that everyone is aware of the impending changes. ERP system can consider as successful implementation when every employee is comfortable with change.

- **Approach for Successful ERP Implementation**

An ERP implementation project without a clear roadmap is a lengthy journey fraught with opportunities to head off course. It is essential for organizations to select and put into operation the most effective ERP solution, irrespective of whether they are automating from the ground up or transitioning from a legacy system. Here are some justifications that aid in reaching a comprehensive comprehension.



Figure 4.5: Roadmap to a Successful ERP Implementation

Effective goal setting

As a result, any capacity to demonstrate and highlight regular roadmap accomplishments acts as a source of motivation that can help maintain the project's

timeline while also reminding the entire workforce of the steps that ultimately result in a profitable business end.

Software Selection

You may swiftly get rid of systems that don't work for you if you know what you want the software to do. However, there are a few criteria that businesses should keep in mind as they focus their search. It is quite uncommon to find a system that will immediately satisfy all of the requirements. To ensure that a new system fully satisfies an organization's needs, software adaptations are almost a given. Prioritize the needs, nevertheless, and look for software that closely satisfies the most crucial needs of the business without requiring customisation. You have chosen the incorrect program if the consultant is recommending extensive customization for each and every module.

Document key Requirements

Key to the document the procedure and requirements will serve as the milestone for setting up the ERP application and aid the implementation team in creating the project plan. We need identify any red flags or discrepancies between the needs of the clients and the features of the system, this involves meetings and discussions with the executive team, the implementation team, and the project team. This also entails talking with the executive team about the specific approach. There can be new projects in progress that have an impact on the system's requirements. For example, there are probably significant ramifications for how the new system should be configured if the corporation intends to build a small number of additional stores in a single nation.

Cost Control

The significance of cost management is evident in a variety of contexts, which includes system research, selecting an ERP software provider, development and implementation, cost controlling, and even keeping an eye on one's business finances until a system is ready to "generate money". Given that cost-creep is a fundamental component of many enterprise challenges, this latter insight is actually the most crucial roadmap justification of all. Ultimately, if your expenses exceed your income, you won't be able to keep operating for long.

ERP Configuration

Modern ERP software systems contain numerous configuration settings, therefore it's crucial to set them up carefully because the ERP software's setup will determine whether or not many of your system's criteria are met. As there are many ERP solutions in the market, so we should be choosing the ERP which would best fit for business with least customizations.

End-user training

This is yet another crucial stage that is typically disregarded or underappreciated. End users will receive training on how to use the system at this point, which is crucial because the people who will use it on a daily basis will help in the overall success of the ERP project by leveraging all its features which would have impacted the business processes. After all, "the best technology in the world is useless if there isn't a community that is enthusiastic about it and wants to use it." The most successful ERP training helps users grasp the program at a deeper level by teaching them more than just "what does this button do?"

Limitation of the study

This study has a number of drawbacks, the most significant of which are the small sample size and low survey response rate. Naturally, this reduces the study's ability to explain its findings. The following explains the primary limitations: Less than 50% of respondents responded, which could have a negative impact on the findings. Since many respondents were unsure if they belonged to the targeted category, it was difficult to find targeted respondents.

Because of this, the response rate was lower than anticipated; therefore, in order to improve responses, particularly with regard to industry-specific solutions for supply chain management, the research should provide a clearer definition of ERP systems. The survey responses included missing data, representing another issue related to data collection. Response rates to items related to the ERP implementation project are comparatively low, as some respondents who were not involved in the project may not be familiar with the relevant details, especially for items describing the project's implementation status.

The sample size of the responses was inadequate for the statistical validation of the proposed ERP success model; to yield improved results, a comprehensive study requires additional data points. In order to sufficiently validate the research model, it is usually required to have a minimum of 10 responses for each variable; however, in reality, additional data were necessary to generate improved results for this study.

Additionally, due to the limited time available, this study was carried out at one specific moment. It would be fascinating to track changes in how obstacles in an ERP project are perceived over time through a time series research. It would offer insight into how perceived difficulties are handled and how they evolve during the project. Longitudinal studies of these firms would shed light on the process of their increasing proximity to suppliers regarding ERP and information exchange. Expanding the perspective and conducting interviews with suppliers and customers to learn about their opinions on the ERP system modification is another chance for future study. Instead of concentrating on a small number of companies, it would provide a broader "all around" look.

Scope of Future Research

There are numerous methods for creating ERP extensions that can be advantageous for companies involved in supply chain management. There are many options, which encompass both internal and external interactions. While ERP can provide businesses with a competitive advantage, this necessitates the initiation of a continuous learning and improvement process. Companies that do not take this route will ultimately lag behind their competitors because of "competitive convergence." The primary findings of this study raise the following suggestions for potential future research:

According to this study, many of the shortcomings of the previous programs have been mitigated by fully web-enabled ERP services. With the most recent additions, the ERP function has become more dynamic and significant, which has increased its momentum. ERP services that are web-enabled assist businesses in monitoring events. Since the entire system is accessible over the internet, employees are unable to engage in any kind of financial misappropriation or other illegal activity. Furthermore, it was simple to identify and fix the mistakes. This strategy benefits not just the company's employees but also its stakeholders, well-wishers, and anybody else who wants to learn more about the business. They have online access to the information at any time.

Web-enabled apps simplify the tasks of employees. They can make decisions on every little matter without needing to consult others first. In reality, it has allowed them to work in a more productive and comfortable manner. As any clarifications can be made online, external partners will benefit significantly alongside the company. Outsiders typically don't make mistakes when collaborating with the company because they are usually sharp. As they are easily detectable through the online tracking system, any errors will be rectified promptly.

Nevertheless, the data that was made available was still unsatisfactory. This feature has been enhanced by web ERP software, which provide everything online. Web-enabled or e-pages of ERP has been considered as the most needed solution for business. In addition to the current modifications, this system needs further improvement.

According to this study, "Function" is the most crucial element for ERP success. It can greatly improve the system's perceived utility and quality, which will ultimately

result in ERP advantages. The term "function" was used to describe how well ERP software matched the essential business operations of the organization. "How can we properly define our necessary business activities and how does the ERP system match our requirements for the necessary functions?" is the question that emerges from this discovery. Without a doubt, we will have a better probability of ERP success if we can effectively solve this issue stated above.

A best-of-breed strategy, where distinct software modules are chosen for every process or function, is the current trend in ERP installation. To guarantee greater support and better ERP deployment outcomes, ERP companies typically advise their clients to purchase their complete software package. This condition raises the following queries: "What distinguishes these two methods from one another? Which strategy is better for our business? How can we choose which ERP modules to include and which features to use in best-of-breed systems if we mix these two methods? When considering integrating ERP software with their software package, the majority of supply chain organizations will find the answers to these questions to be very helpful.

Most ERP providers stated that for companies that insist on changing their business processes, the optimal way to take full advantage of ERP implementation is to make no changes or only minimal adjustments. However, the majority of businesses request that the ERP provider modify its software while retaining the majority of their business processes. This may call for striking a balance between altering an organization's business procedures and customizing its software. This situation raises the following questions: "To what extent will we need to modify the ERP system?" and "How many of our processes will we have to change and what is the impact of changing them?" How much work is involved? How much does it cost? In what way will these changes influence our capacity to update to more recent versions of the package?

Conclusion

This study in the areas of supply chain and ERP systems provides organizations with a strong rationale for improving and expanding their SCM practices and ERP system via innovation, investment, and system development. The effectiveness and efficiency of SCM procedures and ERP systems have a positive effect on the company's performance and competitive advantage. Organizations with one or more competitive advantages perform better. SCM procedures and ERP systems were employed by the organization to reduce process errors, slash production costs, obtain a competitive edge in cost leadership, and improve firm performance. Contextual elements such as the scale of the business, distance, volume of transactions, type of industry, preferences of buyers, and others may influence practices related to "SCM" and "ERP" systems.

The company must devote a significant amount of organizational resources and make software and hardware investments in order to deploy an ERP system. This could result in higher fees and expenses for the company. Additionally, there are integration issues that come with ERP adoption, like integrating with external partners, internal business processes, and legacy systems. These issues could make it more difficult for the company to run its daily operations, raise expenses, and cut its financial performance. Only after prolonged use and the realization of ERP's financial advantages can it be integrated into the company's day-to-day operations. This suggests a time-lag in the effects of ERP deployment on performance enhancement.

A more thorough examination of the sample companies' atypical performance distribution indicates that although some firms see negative financial performance, others see exceptional financial performance. This could be as a result of differences in how well different companies are able to handle the important variables affecting the ERP installation. A company's leadership, organizational structure, culture, human resources, IT project implementation experience, and other material and immaterial resources may have an impact on how well ERP is implemented and how it affects business performance. Particularly in the years immediately following adoption, ERP does not always assist them in achieving better financial success. The performance of businesses may deteriorate in the years immediately following ERP installation due to the significant expenditures of doing so. Therefore, before

implementing ERP, businesses should establish logical implementation goals and prioritize process management.

Future research can be built upon the study's structure. Hopefully, future research by other researchers will be able to consider additional characteristics that were not covered in this study.

Reference

- Ketchen et al., 2008 D. Ketchen, B. Boyd, D. Bergh, Research methodology in strategic management. Past accomplishments and future challenges *Organizational Research Methods*, 11 (4) (2008), pp. 643–658
- Susan, A. Sherer. 2005. From supply-chain management to value network advocacy: implications for e-supply chains. *Supply Chain Management: An International Journal* 10 (2): 77--83.
- Lummus, R., Vokurka, R., & Alber, K. (1998). Strategic supply chain planning. *Production and Inventory Management Journal*, 39, 49-58
- Kanakamedala, K., Ramsdell, G. and Srivatsan, V. 2003. Getting supply chain software right, *McKinnse Quarterly* 1.Short, D. 2002. Dean's forum--convergence. *Mid-American Journal of Business* 17(1).
- David, C. Chou, Xin Tan and Daivd C. Yen. 2004. Web technology and supply chain management. *Information Management & Computer Security* 12 (4): 338--349.
- Rahman Seresht and Afsar.(2008). The effect of information Sharing on competitive strategy and supply chain performance, *Iranian journal of information technology*.1(2),pp37-48.
- Chandra C, Grabis J (2007). Supply chain configuration –concepts, solutions and applications. New York: Springer Science and Business Media
- Norris et al., 2000 G. Norris, J.R. Hurley, K.M. Hartley, J.R. Dunleavy, J.D. Balls *E-business and ERP: Transforming the Enterprise* John Wiley & Sons, Canada (2000)
- Li, M. H. ; Robinson, E. H., 2006. Use of cottonseed meal in aquatic animal diets: a review. *North Am. J. Aquaculture*, 68 (1): 14-22
- Mzoughi, N., Bahri, N., & Ghachem, M. S. (2008). Impact of Supply Chain Management and ERP on organizational performance and competitive advantage: Case of Tunisian companies. *Journal of Global Information Technology Management*, 11 (3), 24-46.

- Keskinocak, P. & Tayur, S. (2001). Quantitative Analysis for Internet-enabled Supply Chains. *Interfaces*, 31(2): 70-89.
- Ie-Ray, Bb.S. (2003).yScotttie Ray February, 2003. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.203.2878&rep=rep1&type=pdf>
- Cook, L. S., Heiser, D. R., &Sengupta, K. (2011). The moderating effect of supply chain role on the relationship between supply chain practices and performance: An empirical analysis.
- International Journal of Physical Distribution & Logistics Management, 41(2), 104–134. doi:10.1108/09600031111118521
- Chen, I.J., & Paulraj, A. (2004). Towards a theory of supply chain management: the constructs and measurements. *Journal of Operations Management*, 22 (2), 119-150.
- Zhang, X., Donk, D. P. van, &Vaart, T. van der. (2011). Does ICT influence supply chain management and performance?: A review of survey-based research. *International Journal of Operations & Production Management*, 31(11), 1215– 1247. doi:10.1108/01443571111178501
- Devenport, T. (1998). Putting the enterprise into the enterprise system. *Harvard business review*, 76(4), pp. 121-131.
- Nah, F., Lau, J., & Kuang. (2001). Critical fac-tors for successful implementation of enterprise systems. *Business Process Management Journal*, 7(3), 285-296
- Ruivo, P., Oliveira, T., Johansson, B., &Neto, M. (2013). Differential Effects on ERP Post-Adoption Stages across Scandinavian and Iberian SMEs1: *Journal of Global Information Management*, 21(3), 1–20. doi:10.4018/jgim.2013070101
- Al-Fawaz, K., Al-Salti, Z., &Eldabi, T. (2008).Critical success factors in ERP implementation: A review. Retrieved from <http://v-scheiner.brunel.ac.uk/handle/2438/3336>

Appendix I