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A Research Study on Logistics Management with ERP Implementation & Forecast for Future

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ABSTRACT-

Enterprise Resource Planning (ERP) is like a special software that helps businesses connect their information smoothly. It is made up of different parts, like finance, accounting human resources, supply chain, & customer information. When companies try to put ERP systems in place, it can take a long time & be pretty tricky. In fact, many times these efforts don't work out well, hurting business performance. Studies suggest that about 70% of these fail to deliver all the benefits they hoped for. Now, we live in a fast-moving world where information changes quickly. Computers are everywhere and Technology keeps growing. Because of this, ERP systems have become essential. They help businesses manage their operations better after using them for a while. For Chinese companies, having a good logistics management information system is super important. It really helps them boost their logistics efficiency. Companies today need to keep up with different demands, tough competition, & quick changes in strategy. This is key for the success of logistics companies. The logistics management info system has gone through different stages: MRP, MRP II, and now ERP. The goal of this article is to explore how computers can help in managing logistics by creating an ERP-based information management system for enterprises and why logistics info management system matters so much. We'll take a close look at how to use the ERP system to analyse complicated logistics tasks while also laying out the whole framework of the system along with its specific functions & data model in detail.

Keywords - Enterprise Resource Planning (ERP), Software, Human Resources, Information Management

INTRODUCTION -

Today, the world of logistics is influenced by many things. Like the economy, politics, & even how act. These elements are really connected to what's happening in the market. There's a lot more competition now, & all of this creates big hurdles for people working in logistics and transportation. Problems like these don't just go away. At first glance, they might seem the same each year. But they can actually be in lots of different ways. It's super important pay attention to these risks in global logistics because they have a huge impact on our economy. How well everything moves is so important for keeping customers happy & helping businesses grow. These days, people expect their stuff to arrive quickly & reliably. Did you know that around 55% of folks might switch companies just to get faster delivery? That's a big deal! So, businesses are always working hard to improve. They want to meet these expectations & stay ahead in this ever-changing world of logistics. The ERP archive dates back to the 1970s. It started with a goal: to bring together business processes [1]. The term ERP was created by the Gartner Group, and they kicked things off in the early 1990 [2,3]. Companies like SAP began rolling out ERP during that same time [4].

In 1992, SAP launched its R/3 version. This version had something cool—customer-server hardware that could handle many tasks at once. By the year 2000, major ERP software providers tackled the Y2K issue and found

solutions. Over these last ten years, the ERP software market has grown a ton! Service providers are now delivering business-wide applications with a wide range of features and functions.

What is ERP?

ERP stands for enterprise resource planning. It's a tool for businesses use to keep things running smoothly. They help manage important parts of how a business works. Lot of companies need different ERP software because it brings together all the functions into one system. This makes resource planning much easier. Enterprise Resource Planning handles many processes that help a run well. It after things like human resources, orders, inventory, accounting, and customer relationships. ERP as software that combines different functions into one special system. This helps make operations easier and shares important information across the whole company. ERP solutions work on a common database platform. Many parts of the business use this platform's various features. This means employees in different areas, like accounting or sales, can trust they're using the same info for their needs. It helps them do their jobs better and boosts overall performance. So really, ERP software is super important for transportation & logistics because it offers so many benefits. (https://www.deskera.com/blog/erp-for-transporation-logistics/)

Akkermans et al. [5] also state that ERP can be defined from different perspectives such as functional, technical, or from business perspective that provides strategic value encompassing the entire organizations. Tarantilis et al. [6] define ERP as a system that integrates traditional accounting, manufacturing, sales, management, and other management products to offer an "all-in-one" solution that deals with all business management aspects of organizations.

Development of ERP-

In the early 1990s, Gartner Group Inc., a well-known American computer technology consulting and evaluation team based on the development of computer data processing technology and the needs of enterprise supply chain management at the time, predicted this trend [7,8]. In the information age, the development of production management information systems and the upcoming changes make it possible for the concept of ERP and the planning of business resources. ERP is a complete system that can collect all internal resources of the organization and execute effective planning and control to achieve maximum benefits [9]. Its goal is to improve information, logistics, capital flow, value flow, and business flow by using programming and control as a benchmark and using network and information technology as a platform to integrate marketing, sales, and customers and improve customer satisfaction [10]. Functions such as market, planning, production, financing, quality, service, data integration, and business process reengineering (BPR) are combined to solve the concepts and methods of supply chain management (SCM) [11].

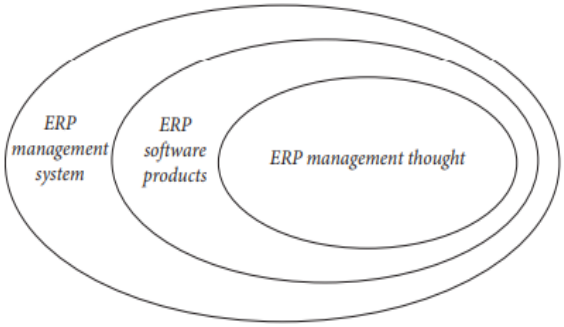
It can be divided into three levels: management ideas, software products, and management systems [9].

1. Standard business management system proposed by Garter Group Inc. is developed based on MRPII (Manufacturing Resource Planning). It's a management concept that supports the supply chain.

2. With integrating client/server systems, relational database structure, object oriented technology, graphical user interface, fourth-generation language (4GL), network communication software products, another success in the information industry is based on the idea of ERP management [30].

3. A business resource management system combines corporate management concepts, business processes, basic information, human resources and materials, computer hardware and software. Internal and external resources of the enterprise organization are managed and optimally configured through the network. Conceptual hierarchy of a new

generation of management information system [16] ERP that manages information at the enterprise level can be shown in Figure 1:



ERP for Transport and Logistics-

Enterprise Resource Planning (ERP) systems are essential for optimizing operations in the transport and logistics sector. They offer a unified view of the entire supply chain, enabling real-time tracking, efficient inventory management, and accurate demand forecasting. By centralizing data and automating processes, ERP systems reduce manual errors, enhance efficiency, and improve resource utilization. They also provide robust analytics and reporting capabilities for informed decision-making and support asset management and maintenance. Additionally, ERP systems streamline customer communication and support scalable growth, ultimately boosting operational effectiveness, customer satisfaction, and profitability.

Regarding the significant impact of ERP systems in a company, Chen et al. [14] state that, "the success of a company increasingly depends on timely information (internal and external) being available to the right person at the right time for crucial managerial decision-making," ERP system integrates all business process and functions enabling organizations to improve efficiency. Davenport [15] states that, "the business world's embrace of enterprise systems may in fact be the most important development in the corporate use of information technology in the 1990s." However, ERP's contributions to organizations strategic value creation efforts depend on many critical factors including its right implementation and the effective management of its operational performance during its lifecycle [16].

ERP Implementation-

It is the process of checking the current pattern of business execution, planning strategy, operation methods, deploying and checking ERP software, data management, change management, user training, and post-maintenance support [17].

ERP System Step-by-Step Implementation Process-

There are seven main steps to rolling out an ERP system. They include business process research, software installation, data migration, software performance testing, user training, total deployment, & after-implementation support. Let's break these down a bit more.

1. **Business Process Research:**

ERP implementation process starts with the definition of the requirement, objectives, and scope of ERP in the given business process [18]. It further requires building a team that can work on the ERP deployment project from start to end. The team shall have the following structure of members 9 [20], The Main Responsibilities of the Team are

- Map, document, and analyse the current processes in an organization [19].
- Try to identify major problems, wastage in the process, and customer-oriented issues.
- Set specific targets with precise quantification for an ERP deployment linked with the key performance areas.
- Set a good schedule with a cost budget.

2. Software Installation:

After creating new process flows, team needs a solid for the new business. Next, the developer will set up build the infrastructure. includes the data store, a way to display data, and making sure there's internet access.

3. Data Migration:

In this step, all information that is data is migrated to a new software system. All the data should be studied and corrected for the same unit before the actual transfer to a new location. This step includes a new data storage location setup, data mapping between the earlier and new store locations, and data transfer.

4. Testing:

The quality engineer test all data interfaces, its functioning, and actual-time data transaction. Users must confirm that data is flowing precisely between different departments.

5. User Training:

User training is based on ERP software complexity, and employees respond to change management. Under training results in production stoppages up to 56% case of ERP deployment after it goes live.

6. Total Deployment:

Organization can choose one out of following three approaches depending on an ERP software size and the availability of the resources.

7. Support:

ERP projects' performance evaluation during the complete life span of the project is very important. The following key performance indicators can be considered for the evaluation of the ERP project,

- Actual implementation cost against planned budget
- ROI that is investment returns.
- Human error assessments.
- Production or supply chain efficiency.
- Customer satisfaction and loyalty

Current ERP Software Trends & Forecasts for Future-

The ERP system was initially upgraded with the exclusive addition of the data cloud or data store management. Further digital transformation added some exclusive current trend or features to the ERP system explained below (Finances online, 2020), Data Cloud Acceleration: Data cloud-based ERP is the game-changing trend. The ERP

software is served at user location with hardware and start-up costs, which can be a high cost for small firms. The emergence of cloud computing helped users by major cost-cutting at the maintenance and upgrading of the software system. Business firms are also going for a hybrid ERP option. Hybrid ERP system integrates the good points of cloud and physical site based ERP while balancing the weaknesses of each other. This tool is very useful for firms in digital business and services. Some of the best ERP software in the market today is NetSuite, Sage Intacct, Syspro, Sage Business Cloud Enterprise Management, and Oracle ERP (Deskera, 2020).

Artificial Intelligence:

AI that is an artificial intelligence with ERP, is termed as iERP. It helps businesses with fast processing of complex unstructured data with innovative ways and actionable insights. iERP is creating simplified workflows, reducing mistakes, reducing the data processing time, and more [21].

Mobile Application:

Mobile had been earlier an "extra" belonging, but today it is a fixture. Today's ERP tool provides total mobile support by performing business processes anywhere and anytime with exceptional total productivity. For example, employees can perform urgently required work from home instead of long hours at the office by accessing all the data on their mobile. Smart communication allows Mobile ERP to reduce the risk of delay in production. Mobile ERP also allows real-time decision-making, smooth workflow, and increased efficiency (Linchpinseo, 2020).

Big Data Analytics:

ERP software is highly acknowledged for data collection and organization. Modern ERP software now includes enhanced capabilities for data analytics, on-demand reporting, and data visualization. Organizations leverage these features for essential decision-making processes, such as financial management and other areas, thereby supporting decision-making from manufacturing units to individual executives. The future ERP shall analyse both data structured and unstructured. ERP software shall predict future trends based on data availability from all the departments that make a strong feature allocation of the predictive analysis.

3D Printing and Real-Time Data Support:

Actual-time data access gives exact operation insights, timely decision making, customer satisfaction, and more. 3D printing is the current ERP trend in manufacturing, which allows companies for cost cut and better efficiency. CRM and ERP integrated software can give data like buying histories and other requirements of the customer that help to better judge the opportunity of the sales, customer retention, and creating brand loyalty (Linchpinseo, 2020).

Finance Focussed ERP:

Modern finance integrated ERP system gives routine ledger, money and payroll management, assets control, and more. Built-in modern ERP software facilitates fast decision making and strategy deployment. It allows the finance department to react to any incidents in real-time and adapt to required changes.

Digital Marketing Focuses:

ERP real-time data helps to decide the target audience for marketing campaign strategy. Digital marketing integrated ERP is also using social media bases for decision making by collecting data like links sharing, post publishing, response collection on social media surveys, and more.

Personalized ERP Solutions:

The small business adopted the modular approach for ERP implementation. In the 2019 modular approach changed to more personalized and vertical improvements at companies as they will get the improved solution without the need to depend on IT consultants or teams [22]. This personalized ERP solution is tailor-made to achieve the specific need of a particular industry [23].

Additive Manufacturing:

The adoption of additive manufacturing is another new trend in ERP in manufacturing. ERP provides the digitized data to the 3D printers with a single platform. ERP software monitors total production material count starting from raw, in-process, finished goods, and final dispatch.

IoT:

The Internet of Things, or IoT for short, is really cool It connects all sorts of sensors in a data network without needing person to press buttons. When you pair IoT with ERP, they work together to collect, check, & process huge amounts of data using network sensors. This helps keep an eye on how well machines running. In 2020, the manufacturing industry was set to put $40 billion into IoT platforms, services, and systems (Finances online, 2020).

Use and maintenance

Now, let's talk about what researchers are looking into. They've been diving into the benefits that come after ERP is up and running. They also explore its limitations & what affects how well ERP works. Some studies focus on how ERP systems impact performance in businesses and help with accounting tasks. Others look at techy stuff like ERP upgrades, security measures, maintenance jobs, and how well databases perform. So, it's a big area with lots to discover.

Bhargava and Choudhary [24] discuss the economic benefits of information intermediary (info-mediary) to businesses. ERP can be used in info-mediary design that facilitates establishment of a buyer-seller agreement and value-added services that provide enhanced benefits from matching services.

Ming et al. [25] presented a decentralized mechanism design for supply chain management organizations using an auction market. ERP adds value by improving the coherence and integrating the needed information in decision making process.

Stijn and Wijnhoven [26] apply the systematic analysis method of memory mismatches (SAMMM) to ERP systems in the usage stage and identify the method's theoretical and practical value and its limitations.

Loo [27] proposes the implementation of an information technology service management capability to help in the management of information technology associated with the ERP solution implemented.

Main Problems or Gaps found in ERP System Application-

We found out some gaps in the ERP implementation process that may results in failure as listed below,

1. Falling back to old practices: The ERP system application and standardization is a long time project that needs consistent adaption, and failing to it may result in falling back to old practices [20]

2. Senior leadership strong support required: The ERP implementation requires a big-budget, long time involvement, and timely decision making over resource allocation.

3. Data Security [28].

4. Exact business needs identification: ERP application consultants try selling complete solutions where business needs to define ERP requirements based on our targets [29].

Proposed Solutions over ERP Implementation Gaps-

An ERP software deployment can encounter issues like those mentioned above. To ensure successful implementation of the ERP system, we suggest the following:

First, an ERP implementation partner project manager needs to outline the project's scope with great precision. This should be based on the organization's team. Additionally, it is important to clearly define each team member's responsibilities and list all necessary resources. Before kicking the project, the project manager should share the scope and resource list with senior leadership. This is essential for gaining approval regarding budget and time constraints.

Next, user training & change adaptation management are crucial. Every user of the ERP software needs proper training on the new systems and job responsibilities. This way, they can adjust to the changes smoothly over time.

Lastly, it's vital to plan for future growth and its scale. Outlining potential business expansion will help prevent delays or setbacks that could impact our needs for weeks, months, or even years in the future.

Conclusion-

The number of publications within the information systems community on ERP systems appears small compared to the size of the business they generated. The publications identified in this paper originate from a small number of sources and are quite recent. All major IS conferences and Journals since in 1997 dedicated at least a track to ERP systems. This study shows that ERP researcher mainly concentrated on issues related to the Implementation phase of the ERP lifecycle. Until now, the other phases have been almost forgotten. One of the reasons is that the majority of organizations are in the implementation phase. Also, in some phases, namely acquisition and implementation, the strong intervention of consultants makes it difficult to access information. Although several ERP systems are in the market, the majority of case studies analyse SAP systems. Few studies and little research generalize the findings to other ERP systems. ERP systems offer many potential areas for research, several of which are discussed in this article. Due to their pervasive nature, ERP systems are of interest for a wide range of professional and scholarly communities (from software engineering to accounting), apart from the IS field. This suggests that ERP-related research could or should be interdisciplinary. In our opinion, the number of publications on ERP systems will grow exponentially in the coming years, because many universities created research areas in ERP systems and the interest of the IS community is also growing.

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