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Rohit Kenge

Research Scholar, SOCMS, Sandip University, Nashik, Maharashtra, India

 <https://orcid.org/0000-0003-3261-5838>

Zafar Khan

Head, SOCMS, Sandip University, Nashik, Maharashtra, India

Abstract

The ERP archive found from long back years may be in 1970, and it had been initiated with the aim of business processes integration. The Gartner Group coined the name ERP, and it had implemented at the start of the year 1990. Software firms such as SAP had initiated to deploy ERP at the start of the 1990s. SAP further delivered the R/3 version in the year 1992. The SAP R/3 had been equipped with the addition of customer-server hardware construction to work on many stages at a time. The year 2000 had seen the solution over the problem of Y2K by all major ERP software system providers. Over the last 10 years, the ERP software market has to spread immensely with service providers are catering business-wide application with a complete range of application and functions.

This paper tried to study the detailed ERP system implementation process and current trends in ERP software. Further, we found out some problems or gaps in an ERP system application process and tried to answer it with proposed solutions.

We conclude this study as "an ERP system integrates all the functions in an organization like finance, marketing, manufacturing, and human resource with an advance real-time data collection, processing, and communication with very fast speed and allowing the organization for a quick decision on the real-time issues to control the complete business process day today."

Keywords: ERP Implementation, Data-Cloud, 3D-Printing, Digital Marketing and AI.

Introduction

The ERP archive found from long back years may be in 1970, and it had been initiated with the aim of business processes integration (Sheilds and Murell G., 2005). The Gartner Group coined the name ERP, and it had implemented at the start of the year 1990 (Chang, SI et al., 2000) (InfoWorld and Heather Harreld, August 27, 2001). Software firms such as SAP had initiated to deploy ERP at the start of the 1990s (Robert Jacobs, 2007). SAP further delivered the R/3 version in the year 1992. The SAP R/3 had been equipped with the addition of customer-server hardware construction to work on many stages at a time. The year 2000 had seen the solution over the problem of Y2K by all major ERP software system providers. Over the last 10 years, the ERP software market has to spread immensely with service providers are catering business-wide application with a complete range of application and functions.

In the next 10 years, business patterns will change by change in the ERP pricing structure, application methods, and adjustments to a vertical market. Many data are storing cloud application models. For example SaaS is seeking the attention of companies. The ERP pricing model of payment as per usage is largely adopted by the business firms trying to change huge capital cost with a month on month subscription (Deskera, 2020).

Definition

ERP: The ERP's full form is enterprise resource planning. ERP is informing the data collected from many sub-sources into a single system (Oracle, 2020). For example, a business firm has three main data centers, namely human resources, finance, and manufacturing, where ERP adds all three sub-sources into a single system that presents data with all sub-sources (Almajali and Dmaithan, 2016).

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 (Andrew, Ly. June 8, 2020).

Objectives

- To study the ERP implementation process.
- To study the current trends in ERP application.

Literature Survey

ERP System Step-Wise Implementation Process

The main seven steps of the ERP deployment are business process research, software installation, data migration, software performance testing, user training, total deployment, and after implementation support. We tried to study these steps in detail as below (Andrew, Ly, 2020),

1. **Business Process Research:** ERP implementation process starts with the definition of the requirement, objectives, and scope of ERP in the given business process (Turban et al., 2008). 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 Menon, Sreekumar, July 2019),

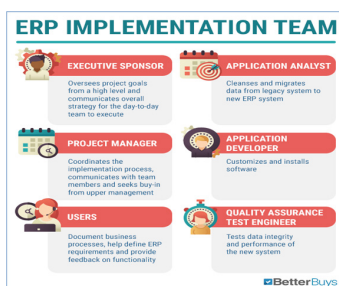


Figure 1: ERP Implementation Team
(Andrew, Ly, 2020)

The Main Responsibilities of the Team are

- Map, document, and analyze the current processes in an organization (Yusuf, Y. et al., 2004).
 - 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 designing the new process flows in the first step team should possess a plan for a new business process. The software developer will install and build the infrastructure for software, such as data store, data display, and internet availability.
 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 (Ramaswamy, V.K., September 27, 2007).
 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,
 - **Big-Bang Approach:** A single day transition from the old to the new software. This approach is fast and cheap, but any deployment inefficiency may result in a major problem at operation.
 - **Phased Approach:** A phased transition by function or unit that will consume longer time.
 - **Parallel Operation Approach:** Users use old and new systems parallel that is the less risky. This approach requires more time for duplication

of the work, and the operating cost of the two systems is also high.

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.

ERP Implementation Time

ERP system implementation project can take three months to a couple of years before the system of software is deployed (Sankar, C. and Rau, K.-H., 2006). The exact time depends upon the organization's size, data size, user count, and resources (Pelphrey, M.W., 2015).

ERP Implementation Cost Incurred

The ERP system implementation costs are on-going ERP operating expenses such as,

- ERP software price depends on the license type and renewal frequency, data storage system, user count, and customization level.
- ERP software deployment consultants and trainers team.
- ERP software installation, after maintenance, and frequent upgrades.
- Data clouds.
- Support staff for system maintenance, time to time software upgrades, issues are fixing, and technical support.

Also, we must evaluate the proposed benefits to our budget to understand whether ERP deployment will be profitable. Small and medium-size companies can consider rupees 50 lacs and five crores expense for the ERP software implementation.

Choosing the Right ERP System Consultant

ERP system consultants must have implementation experience within our type of organization with the target of preventing the failure risk at each stage. Consultants may try to sell excess

software by presenting its complete application. However, we must deploy only those required systems that will simplify the business and create returns on investment more quickly. Choosing the right ERP system consultant requires the following checkpoints (Andrew, Ly. June 8, 2020),

- Work experience at our kind of organization.
- They must understand the process of infrastructure set-up for our organization.
- Deploy only required systems.
- Answer the change management issues.
- Perform user training.

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 (Ruhi, Umar, 2016).

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. ERP software today has an added capacity of data analytics, ad-hoc reporting, and data presentation. The organization uses it for critical decisions making like finance matters or other aspects which facilitates decision making feature from the manufacturing units to the individual executives. The future ERP shall analyze 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, favorites, 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 (Vilpola and Inka Heidi, 2008). This personalized ERP solution is tailor-made to fulfill the specific need of a particular industry (Loh, Tee Chiat, and Lenny Koh Siau Ching, 2004).

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. Sculpteo study says that 51% of companies are utilizing 3D printers in their manufacturing process.

IoT: IoT that is the Internet of Things, can offer smooth sensor connectivity in a data network with no human involvement. IoT and ERP together collect, review, and process big data via network sensors that further help to monitor the machine efficiency. In 2020 manufacturing industry has projected an investment of \$40 billion on IoT platforms, services, and systems (Finances online, 2020).

Methodology

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 (Menon, S.A. et al., 2019).
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 (She, W. and Thuraisingham, B., 2007).
4. Exact business needs identification: ERP application consultants try selling complete solutions where business needs to define ERP requirements based on our targets (Brown, C. and Vessey, I., 2003).

5. Long term plans may get missed while ERP deployment to cater to current requirements (Bradford, M., 2015).
6. At the location, ERP software deployment requires a big initial budget and long timelines (Fryling, Meg, 2010) (Gentry, Spencer Rogers, and Sammy, 2018).

Proposed Solutions over ERP Implementation Gaps

An ERP software deployment may go wrong in the above-listed ways, so we proposed some actions for the success of the ERP system implementation as listed below,

1. An ERP implementation partner or project manager shall define the scope of the project based on the organization's team very precisely. Further, they shall define the responsibilities of the individual team members and prepare the resources required. A project manager shall present the scope and resources required list to senior leadership to get the buying over the proposed budget and time availability of the project before starting it.
2. Users training and change adaption management: All ERP software users must be trained with new systems and job responsibility so that they can adopt the change easily over the period.
3. Future growth plan and its scale: Future business expansion scope shall be outlined to skip from new change shall not set back our requirements for several weeks, months, or years ahead.

Conclusion

ERP system had used first by the large manufacturing organizations on-premise to manage the raw, in process, and finish good material information communication. ERP system acceptance rate had slow in the beginning due to ERP implementation is a time consuming and high investment process to adopt for any organization; however, it is adopted by nearly all the business nowadays and changing the business legacy due to its exceptional benefits. ERP systems got upgraded with advanced trends to work efficiently in the last decade and, further, every year added many break-through innovations to organizations. Mainly cloud-based

ERP systems witnessed a high acceptance rate;. However, it has issues of data security and recurring subscription investment. Still, it is a cheaper option to on-premise and can be tailor-made according to business needs that helped much small business. We conclude this study as "an ERP system integrates all the functions in an organization like finance, marketing, manufacturing, and human resource with an advance real-time data collection, processing, and communication with very fast speed and allowing the organization for a quick decision on the real-time issues to control the complete business process day today."

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Author Details

Rohit Kenge, Ph.D. Scholar, SOCMS, Sandip University, Nashik, Maharashtra, India,
Email ID: rohit.kenge@gmail.com.

Dr. Zafar Khan, Head, SOCMS, Sandip University, Nashik, Maharashtra, India