

Evolution of Enterprise Resource Planning

* Mr. Antar Mugahed Ahmed Abdullah, Ph. D Research Scholar, Dr. Babasaheb Ambedkar Marathwada University.

1.1 INTRODUCTION

In the past decades, the world has developed in all sectors. Technological and software application got the biggest share. Enterprise Resources Planning (ERP) was one of these evolution outputs. Enterprise Resources Planning (ERP) defined as integrated business management applications used by industries to do all their functions as Planning, Production Management, Sales Management, Finance Management, Human Resource, etc. After the great success of Enterprise Resources Planning(ERP) the companies initiated to implement this new software which gives companies a competitive advantage. “ERP systems and strategic management processes can lead to a competitive advantage so It focuses on the process of building competitive advantage from the output of the system. According to Keller (2001), this is a process of five major tasks: “Identification, Development, Protection, Internal Distribution, and Usage”. Organisations should concentrate more on changing their strategy and organizational structures, than focus explicitly on optimising the system. Keller further claimed that “Enterprise Resources Planning (ERP) based competitive advantages arise from both interdependent development of the system and the way it is used”. ERP system is a “multi-module transaction-based application software that helps organisations to manage the vital parts of the business”. ERP is a power full software which proved that practically so, most of the biggest companies in the world are using ERP. Also, It attempts to integrate all departments and functions across a company into a single computer system that can serve all those different departments’ particular needs^[1].

1.2 DEFINITION OF ENTERPRISE RESOURCE PLANNING (ERP)

What is Enterprise Resource Planning (ERP)? “Enterprise Resource Planning” is a term originally coined in 1990 by The Gartner Group to describe the next generation of Material Requirements Planning (MRP) software. The purpose was to integrate all facets of the business enterprise under one suite of software applications. The definition of ERP would be broadened to include almost any type of large integrated software package. Eric L. Keller, (2001)^[2].

Also, I quote several definitions from the published literature to further explain the concept of Enterprise Resource Planning (ERP). Webopedia provides a generalized definition of ERP as “a business management system that integrates all facets of the business, including Planning, Manufacturing, Sales, and Marketing”^[3]. ERP is an integrated business management software that a company can use to collect ,store, manage and interpret data from many business activities^[4].The Enterprise Resource Planning (ERP) system is an enterprise information system designed to integrate and optimise the business processes and transactions in a corporation. The ERP is an industry-driven concepts and systems, and is universally accepted by the industry as a practical solution to achieve integrated enterprise information systems^[5].

Daniel e. o’leary, (2000), mentioned that “Enterprise Resource Planning (ERP) systems are powerful software packages that enable businesses to integrate a variety of disparate functions. In particular, ERP systems can provide the foundation for wide range of E-commerce–based processes, including web-based ordering and order tracing, inventory management, and built-to-order goods^[6]. According to Leno Alexis, (2005) Enterprise Resource Planning is “integrated management of businesses which cover all functions, ERP targeted the manufacturing industry, and consisted mainly of function for planning and managing core businesses such as sale management, production management, accounting and financial affairs, etc.”^[7]. Jon David define ERP systems as “A method for the effective planning and controlling of all the resources needed

to take, make, ship and account for customer orders in a manufacturing, distribution or service company” [8].

1.3 EVOLUTION OF ENTERPRISE RESOURCE PLANNING (ERP)

The evolution of enterprise resources planning has been started long time back which comes in different ages the first time was in mid of 20th century as Rashied mentioned that the various departments within organisations used to function independently. These departments are often termed as functional silos. Naturally these systems were deprived of several benefits of coordination. The evolution of ERP systems closely followed the spectacular developments in the field of computer hardware and software systems. Also, because of the huge complexity of business functions and changing of competitive environment, organisations started searching for new technology to fulfill their functions or needs. So, in 1960’s most organizations designed, developed and implemented centralized computing systems, mostly automating their inventory control systems using inventory control packages (IC) this was the first-generation centralized computing systems.

The second generation is Material Requirements Planning (MRP) systems were developed in the 1970’s which involved mainly planning the product or parts requirements according to the master production schedule. The third generation of the new software systems called Manufacturing Resources Planning (MRP II) were introduced in the 1980’s with an emphasis on optimizing manufacturing processes by synchronizing the materials with production requirements. MRP II included areas such as shop floor and distribution management, project management, finance, human resource and engineering.

The fourth generation is Enterprise Resource Planning (ERP) systems first appeared in the late 1980’s and the beginning of the 1990’s with the power of enterprise-wide inter-functional coordination and integration. Based on the technological foundations of MRP and MRP II, ERP systems integrate business processes including all functions as manufacturing, distribution, accounting, financial, human resource management, project management, inventory management, service and maintenance, and transportation, providing accessibility, visibility and consistency across the enterprise. During the 1990’s ERP vendors added more modules and functions as “add-ons” to the core modules giving birth to the “extended ERPs.” Figure 1 summarizes the historical events related with ERP. These ERP extensions include advanced planning and scheduling (APS), e-business solutions such as customer relationship management (CRM), and supply chain management (SCM).

Figure 1: ERP evolution



latest generation of ERP are more advanced and more effective and deals with multiple business functions. It is generally a misleading perception that implementing an ERP system will improve organizations' functionalities overnight. The high expectation of achieving all-round cost savings and service improvements is very much dependent on how good the chosen ERP system fits to the organizational functionalities and how well the tailoring and configuration process of the system matched with the business culture, strategy and structure of the organization. Overall an ERP system is expected to improve both backbone and front-end functions simultaneously Rashid Mohammad (2002) ^[8]

1.4 IMPORTANCE OF ENTERPRISE RESOURCE PLANNING (ERP)

What makes Enterprise Resource Planning (ERP) system very important?

The feature and the benefits that the system provide to the company that use ERP, in other side if the company don't use ERP system will be running on many kinds of software that don't allow interaction. Customisation also may be difficult it in some cases. This will negatively affect the optimized function of organization business activities. Also without ERP system company may face difficulties such as:

- ❖ Have lots of different software for different process.
- ❖ Don't have easy access to information about your business.
- ❖ Accounting takes longer and is more difficult.
- ❖ Sale and the customer experience are suffering.
- ❖ IT is too complex and time-consuming.

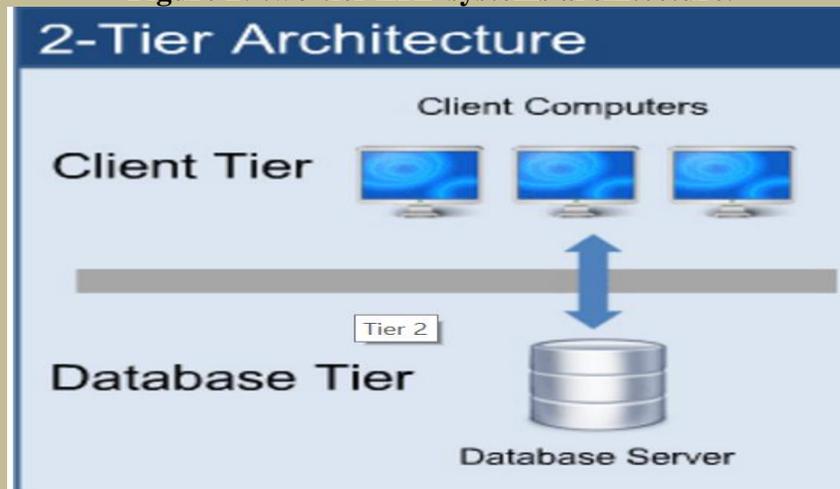
So, this is why Organizations find out that ERP system is very important, ERP also provide users easier access to reliable, integrated information, elimination of process, which result in substantial cost saving, decreasing the order fulfilment time from two weeks to 24 hours only in some companies, standardizing business process. In Enterprise Resource Planning (ERP) data needs to be entered only once so the system provides visibility and transparency access in the entire organization ^[9].

1.5 ENTERPRICE RESOURCE PLANNING (ERP) Architectures

When we talk about architecture of ERP it is also necessary to know how an ERP architecture works and how the system has been deployed in an organization. While the servers may be centralized, the clients are usually spread to multiple locations throughout the enterprise, although ERP applications are most commonly deployed in a distributed and often widely dispersed manner. ERP software and the results are presented to the end user through some user interface. The architecture that supports the connection between the database, processing, and presentation is called Client/Server architecture. The two most commonly implemented architectures are outlined below ^[11].

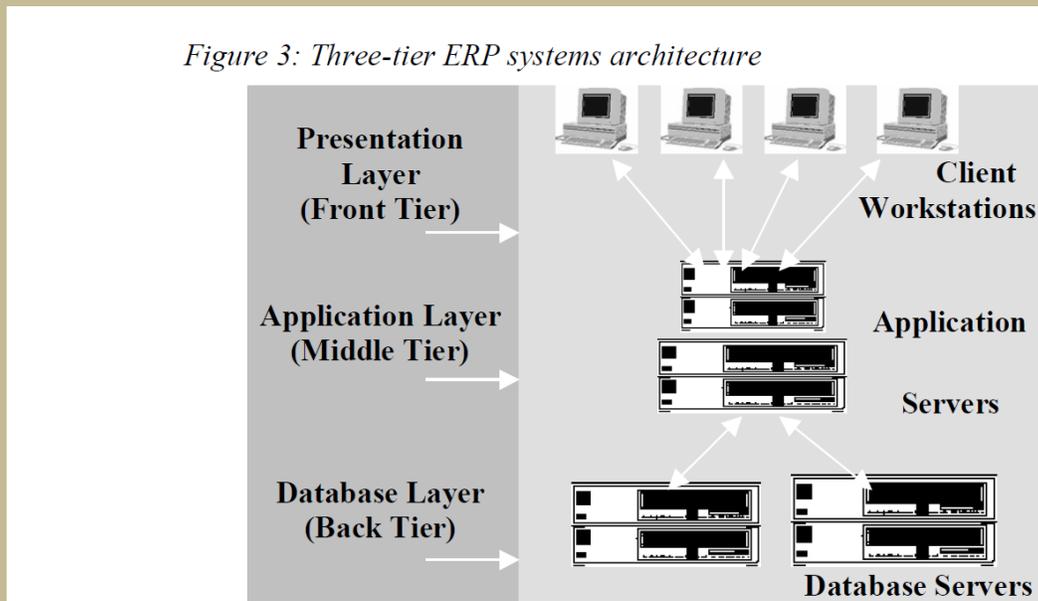
1.5.1 Two-tier Implementations

In typical two-tier architecture, the server handles both application and database duties. The clients are responsible for presenting the data and passing user input back to the server. While there may be multiple servers and the clients may be distributed across several types of local and wide area links, this distribution of processing responsibilities remains the same. Figure 2 summarizes the two-tier architecture of ERP ^[12].

Figure 2: two-tier ERP systems architecture.

1.5.2 Three-tier Client/Server Implementations

In three-tier architectures, the database and application functions are separated. This is very typical of large production ERP deployments. In this scenario, satisfying client requests requires two or more network connections. Initially, the client establishes communications with the application server. The application server then creates a second connection to the database server. Figure 3 summarizes the 3-Tier architectures of ERP ^[12].

Figure 3: Three-tier ERP systems architecture

1.6 MODULES OF ENTERPRISE RESOURCE PLANNING (ERP)

ERP modules can be founded working alone or combined together to form integrated system, these are the common modules of ERP systems:

- **Finance & Accounting Module:**

finance & Accounting module managed whole inflow & outflow of money/capital. This module keeps track of all account related transactions like expenditures, balance sheet, account ledgers, budgeting, bank statements, payment receipts, tax management etc.

Financial reporting is easy task for this module of ERP. Any Financial data that is required for running business is available on one click in Finance module.

- **Inventory Module:**

Inventory module includes functionalities like inventory control, master unit, stock utilization reporting etc. Inventory module can be used to track the stock of items. Items can be identified by unique serial numbers. Using that unique numbers inventory system can keep track of item and trace its current location in organization. E.g. you have purchased 100 hard disk so using inventory system you can track how many hard disks are installed, where they are installed, how many hard disks are remaining etc.

- **Production Module:**

This module consists of functionalities like production planning, machine scheduling, raw material usage, (Bill of material) preparation, track daily production progress production forecasting & actual production reporting. It also providing great help for manufacturing industry for delivering product etc.

- **Sales Module:**

All the sales transactions are managed by sales module of ERP so, sales process includes processes like Sales queries & enquiry analysis & handling, quotation drafting, accepting sales orders, drafting sales invoices with proper taxation, dispatch/Shipment of material or service, tracking pending sales order.

- **Human Resources (HR) Module**

Human Resource Module One of the important sub module in (HR) module is Payroll System which helps to manage salaries, payment reports also helps to (HR) team for efficient management of human resources. Also, helps to manage employee information, track employee records like performance reviews, designations, job descriptions, skill matrix, time & attendance tracking. It can also include Travel Expenses. Employee Training tracking can also have managed by ERP.

- **Supply Chain Management (SCM) Module:**

Supply Chain Management Module (SCM) module manages the flow of product items from manufacturer to consumer & consumer to manufacturer. Common roles involved are manufacturer, Super Stockiest, Stockiest, distributors, retailers etc. SCM involves demand & supply management, sales returns & replacing process, shipping & transportation tracking etc.

- **Customer Relationship Management (CRM) Module:**

Customer Relationship Management (CRM) is helps to enhance the sales performance through better customer service & establishing the healthy relationship with customers. CRM module can be integrated with Sales module to boost sales opportunities. All the stored details of customer are available in CRM module. CRM module helps to manage & track detailed information of the customer like communication history, calls, meetings, details of purchases made by customer, contract duration etc ^[10].

1.6 CONCLUSION

This paper aimed to give the reader a simplified picture of the Enterprise Resource Planning definition and a brief summary of the evolution and its importance of in the field of Business at the present time and outline the two architecture of Enterprise Resource Planning enhanced with two diagrams also nuggets for ERP Modules with common functions of them.

1.7 REFERENCES

1. Fosser Erik, Leister Ole Henrik, et al, “ ERP SYSTEMS AND COMPETITIVE ADVANTAGE”, University of Agder, Kristiansand, Norway
2. Eric L. Keller,(2001) ,“Lessons Learned,” Manufacturing Systems_v17, iss.11, pp. 44-50.
3. Vangie Beal “Enterprise Resource Planning.” Retrieved on 22nd January 2017
4. From <http://www.webopedia.com/TERM/E/ERP.html> .
5. Moon Young B, “ Enterprise Resource Planning (ERP): a review of the literature” Department of Mechanical and Aerospace Engineering Institute for Manufacturing Enterprises Syracuse University, Syracuse, NY 13244.
6. Alshabori Mohammed. ERP Definition SAP overview . Retrieved on 23rd January 2017 from https://www.youtube.com/results?search_query=+mohammed+alshbory+erp .
7. Daniel e. o’leary, (2000),“Enterprise Resource Planning Systems,” University of Southern California .
8. Leno Alexis , (2005)“Enterprise Resource Planning, “Tata McGraw- hill publishing” company limited ,NEW DELHI.
9. Rashid Mohammad et al (2002) , “The Evolution of ERP Systems: A Historical Perspective,” Massey University–Albany, New Zealand, Copyright © 2002, Idea Group Publishing. .
10. Kholoud Al.jahdali , et al, “ ERP SYSTEM”,,. Retrived on 30th January 2016 from <https://prezi.com/dnennm7yy23h/erp-system> .
11. Ganore Pravin, (2013) “ Basic Modules of ERP System”, University of Pune, Retrieved on 30th January 2017 from “<https://www.esds.co.in/blog/basic-modules-of-erp-system/#sthash.lwH05AfT.dpbs>.”
12. . Retrived on 3^{ed} January 2017 from “ <http://eresourceerp.com/erp-architecture.html>.”
13. . Retrived on 3^{ed} January 2017 from <http://www.erppandit.com/erp-architecture.html>.
14. ERP is integrated system