Integration of Open Source ERP with SCM

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Abstract— Nowadays Enterprise resource planning (ERP) and supply-chain management (SCM) are key role players in resulting high business growth across various industries. But there are some limitations of ERP system. By incorporating some new practices in resource planning will reduce the limitations of ERP. One of the options for ERP system will be Open source ERP system. Integration of ERP system with SCM will proves to be beneficial to both user and industries. In this paper we mainly concentrate on textile industry and ERP practices followed in this type of industries. Textile industry is mainly related to machines. The management of material and supply of that material is also very important task in that industry. To manage these business processes ERP system is required. In textile industry not all processes are carried out at the same place. And hence for such distributed business one common and easily accessible system is must. Open source ERP system is fulfilling all these requirements so that, open source SCM is beneficial to this industry. As open source ERP is managing internal work of business, it is also important to handle the supply chain. And that’s why we are trying to implement the integration of open source ERP with SCM.

Keywords— ERP, SCM.

I. INTRODUCTION

Nowadays, Enterprise Resource Planning (ERP) systems are used in several industries since it provides improved convenience to information which facilitates the decision making and managerial control. Unfortunately, the incorrect design, operation and use of this system guide to various malfunctions in the system and might be a difficulty in obtaining the required benefits from this system. ERP software applications assist activities track actual costs and carry out activity based costing. These applications are utilized in controlling and managing the product development, supplies and parts purchasing, facilitating the interacting with suppliers, offering several services for company customers and tracking orders. In addition, the ERP systems may also have application components for several business economics and human resources features. This paper aims to study and investigate the efficiency and the security of Enterprise Resource Planning (ERP) system in the Saudi Arabian American Oil Company ARAMCO Company. Many issues will be taken into account about ERP system in ARAMCO Company as analyzing the used ERP scheme, realizing the system traps, influencing in the field of information management and cost reduction, understanding the role in the work flow, identifying the managing resources in making an incorporated infrastructure, explicating the use of Enterprise Application Integration (EAI) in evading possible ERP malfunction, exploring the work flow in large businesses, revising the use of ERP systems in supply change management, determining the role of ERP systems in achieving competitiveness, utilizing the ERP system as an indicator to the Key Performance Indicator (KPI), discovering its role in developing the operation management, discovering the continuation of ERP in e-commerce and finding out the role of ERP system in supporting B2C processes and procedures [2].

II. ERP AND SCM

ERP stands for Enterprise Resource Planning. The term was first introduced in the mid-1990s by Gartner as a replacement for “Manufacturing Resource Planning” or MRPII, the former name for the software application suite that manufacturers use to manage information from throughout the company and its operations.

Importance of ERP software

ERP software's business solutions are designed for companies that work in a wide variety of areas. IT combines a large number of different elements into a single unit. Three of the most important ERP tools available today are manufacturing, human resources, and finance.

The finance tools allow companies to successfully maintain their financial information like that of the assets, accounts, budgets and cash. ERP can also assist a company in managing internal as well as external factors affecting it. A company that uses ERP financial products can save a great deal of money over the long term, the reason being, the productivity of the organization will be improved. Enterprise Resource Planning is instrumental in getting rid of time consuming activities as paper management. A company is able to study their processes, earnings, and performance by merging their operational information with their financial information. Once this information is connected together, a company can become more competitive and productive. Synergy is an important part of ERP solutions.

The concept of combining multiple processes into a single whole will allow the company to become successful in the long term. In addition to finance and business processes, it is also important to look at materials maintenance. Enterprise Resource Planning will allow a company to successfully automate the process of buying materials and maintaining them. There are modules that
track the supplies that are purchased and can also make calculations about how these materials should be distributed. It also becomes possible for a company to predict the demand of the market based on history, economic statistics, and data from their employees. They can even decide when a product should be produced, and they can do this based on the raw material that is available [19].

The Business Values of ERP

At its core, ERP helps employees do their jobs more efficiently by breaking down barriers between business units. More specifically, an ERP solution:

- Provides a global, real-time view of data that can enable companies to address concerns proactively and drive improvements.
- Improves financial compliance with regulatory standards and reduces risk.
- Automates core business operations such as lead-to-cash, order-to-fulfillment, and procure-to-pay processes.
- Enhances customer service by providing one source for billing and relationship tracking.

With an ERP solution, employees have access to accurate information that enables them to make better decisions faster. Not only that, but ERP software helps to eliminate redundant processes and systems, dramatically lowering the cost of doing business overall.

SCM is an acronym for supply chain management. SCM is also one of the important part of business process. Benefit of business is depending on SCM also. If supply chain works in proper way then, the product delivery process becomes faster and efficient. And hence, it becomes one of the way to impress customers.

III. Need of Integration

- The need of integrations of ERP and SCM occurs when the enterprises realize the importance of ERP and SCM in business process.
- ERP handles the complete business process but it is necessary to supply that business product to the customers.
- The working of both the systems i.e. ERP and SCM is independent but when we consider business profit then these are dependent on each other.
- For example, there is some delivery date for any product. But ERP was not worked properly, and that is why enterprise not able to complete production in decided time period. If production date is extended then supplying product to customer date is also extended. And hence, ERP as well as SCM also suffers from loss.
- If suppose both the systems works together by respecting each other's decisions, business growth becomes much more. Because, if any of them works quite weekly then other can handle the process.
- So ERP and SCM works independently but can handle problems dependently. And that means integration of ERP and SCM becomes beneficial to enterprise.

IV. Benefits of Integration

Lower Costs

By adding an effective SCM system to a business, the added global efficiency can lead to lower costs of raw materials. This system efficiently plans for materials to be brought to your company from the lowest cost provider possible and at just the right time to ensure there is no excess or deficiency in the material. A SCM system can improve your company's relationship with vendors so that there are opportunities to cut costs like through a volume discount.

Improved Collaboration

A SCM system wired in to the latest software allows you to know the position your raw materials and your finished products are in by tracking both your suppliers and your distributors. These companies can also track where you are at in receiving or sending those materials. This knowledge can keep relationships between these businesses strong. This system often includes the development of reports on how the chain of goods progresses from supplier through distributor. These reports help your businesses to determine potential areas of improvement.

Cycle Times

The cycle time can be defined as the time it takes your business to turn over a product from raw materials, give it to your distributor to sell and then make enough money to purchase new raw products to start the cycle over. If at any point it takes too long to obtain these raw materials, production may have to stop which will slow down your organisation. A SCM system improves cycle times and ensures that raw materials are provided when your business needs them so that you never have to stop production.

Response to Conflict

Unfortunately, a business cannot always run smoothly and there are a number of factors that can lead to problems in the production of a product. If an issue occurs with the suppliers of your company, you may have to change how you produce your product. If the distributor goes out of business, you will have to find another way to sell the product. A SCM system lets your company better cope with problems at either side of the production spectrum. You can quickly and easily figure out a response to the problem instead of being surprised by it at a later time [20].

V. Methodology

The integration can be carried out by different ways. ERP is heart of business and hence it is necessary to make improvement in the process. The methodology is as follows.
Make survey of any company

Firstly, do the survey of any company so that we can realize the necessity of ERP system for that company. According to requirement and the number of employees in that enterprise ERP system become implemented for it. And hence survey is very necessary in it. Survey also informs us about which ERP system is required for enterprise and which system in ERP is most important for that enterprise.

For example if the clothing enterprise is there then manufacturing and supply are important parts for that. Here we made survey for the textile industry. And hence manufacturing and supply are important for it.

Implement ERP system

Here when ERP system is implement it maintains the manufacturing system. For that we create complete ERP system for enterprise and then mainly concentrate on manufacturing.

Implement supply chain

As we already mansion in survey, supply chain is also one of the important part in textile industry. So we implement supply chain for it. Supply chain includes manufacturing, raw management, marketing, sales, purchase, supply.

As the requirement of our industry is such that, we need to maintain the demand as well as supply, supply chain plays most important part in enterprise.

Integration of ERP and SCM

We need to create system such that it can helpful for an enterprise. The main requirement of that enterprise is manufacturing and supply chain. As we know manufacturing is part of ERP and supply chain is part of SCM. So for better performance of business process, integration of ERP with SCM is required.

Implementing integration process

From the above process we realize the importance of integration of ERP and SCM. Now we try to integrate these two systems. First of all, create the architecture of integration process so that we can do the process in easier way.

VI. CHALLENGES IN INTEGRATION

Maintenance of large database

Database maintenance is main challenge in the system. As we implement the system for whole enterprise, it is important to keep all the records safe. For enterprise, we should maintain different departments and for each department sub departments are present. And hence if we consider the data then it is so large. At the same time, for every day there were new updates occurs in that data. And hence, size of the database is goes on increasing day by day.

To maintain such data we are using database server, that manage data as well as give reduce the response time.

Web hosting

There are different ERP systems available in the market. But main disadvantage of it is ERP systems are very costly. By this system we are providing system such that, it can show all the advantages of ERP system as well as SCM and also it is open source. To implement such system web hosting is necessary.

At the time of web hosting we face different challenges like compatibility issues for used software’s database maintenance issue, connectivity issue, etc. We were face that challenges and also overcomes through that.

- The Speed Factor- The Critical Measurement Step
- Seeing It All- Maintaining Full Visibility
- Troubleshooting New Performance Bottlenecks
- Managing Multi-Customers, Multi-Sites-Controlled Scaling
- Migrating, Testing, And Launching

Security

This one is another important challenge in case of enterprise privacy. It is very important to keep the enterprise data secure. For that, we first give authentication for each section. Only authorized person can access that section. By using this method system data become secure and by authority, admin can keep watch on everyone’s working.

VII. RESULTS

ERP system which is integrated with SCM modules by using open source technology will in turn reduce the cost of implementation. It consists of different modules, mainly SCM module. Also it has finance, CRM (customer relationship management), MRP (manufacturing and resource planning), and HRM (human resource management). These modules are connected with each other by foreign values/ common values. The ERP system is such that it will maintain the record for supplier, i.e. supply date, customer to whom we are supplying the material, deadline for manufacturing product, payment information, etc. Here the values for SCM are also connected with finance, MRP modules. And hence we can say that, the SCM is integrated with the ERP.
Fig 2: stock notification in Purchase window

Fig 3: Sales Window

Fig 4: Record window
CONCLUSION

ERP systems are sets of integrated applications that can provide a total solution to an organization’s information system needs by addressing a large proportion of business functions including finance, accounting, human resources, supply chain and customer information. ERP system support a process-oriented view of the business as well as business processes standardized across the enterprise. Open ERP is always a good choice in terms of risk and the cost of integration.

Accordingly, the industrial trend between ERP and SCM is that the integration of supply-chain capabilities with ERP systems will continue to be enhanced in the near future. One of the main reasons is that cross-enterprise integration will continue to be one of the major organizational goals, especially for those whose business success is directly dependent upon the success of their supply chain. Driven by the market forces such as shifting channel power and demand for fast cycle-time-to-market, SCM has created a critical and influential business success. Consequently, organizations begin to rely on SCM systems as a new source of competitive advantage.

In conclusion, the core of ERP, an integrated set of applications that link together back-office operations, will become a subclass of a much larger and broader enterprise business system. The integration of Open source ERP and SCM will create a new spectrum in the information industry, i.e. the integration of all core business processes through one comprehensive information system and the cooperation among multiple parties and trading partners in the value chain to create a collaborative business and operational environment.

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