

Supply Chain Management ERP Solution

Ms. Sangita Wasnik
Department of Computer Science & Engineering
Nagpur Institute of Technology
RTMNU University, Nagpur, India
Sangita.wasnik@gmail.com

Prof. Jagdish Pimple
Department of Computer Science & Engineering
Nagpur Institute of Technology
RTMNU University, Nagpur, India
pimplejagdish@gmail.com

Abstract—Distributed cloud based business management system is a fully functional, integrated, web-based, ERP that offers a unique value proposition - a higher value at a lower cost. The system is for small and midsize enterprises that are looking for an integrated system to manage their business. One that is capable of managing daily operations, optimizing business processes, improving customer satisfaction and, ultimately, increasing profits. Enterprise resource planning (ERP) is an industry term for the broad set of activities that helps an organization manage its business. Distributed cloud based business management system is business management software. Now company no need to worry about managing their work. The Present System faces a lot of problems in generating complex reports and maintaining the daily accounts of products.

Keywords-Enterprise Resource Planning (ERP), Open ERP, SMEs, Operations Management, ERP Designs and Implementations.

I. INTRODUCTION

Supply chain management ERP solution is a process by which a company manages and integrates the important parts of its business. It integrates areas such as planning, purchasing, inventory, sales, etc. Let us understand the root of the existing system and need of solving the problem. Consider a trading company or the sells team of the manufacturing company. These companies stock the material and take orders. Whereas there are different and geo-graphically distributed locations from where the product can be ordered and warehouse or trading company's offices are present at different places.

- Centralized computing for distributed branches:

Now if an order of 10 items comes for Branch A and the stock of that Item is not present in Branch A then that order is lost as it's a very small window of time where customer need the answer for availability of Item, sells man has no time to check the item in all other branches. For a single Order, there can be multiple items which are not present in Branch A. Here, this system allows the sells person to look for the complete order in all available branches and processing it. Also, Inventory is updated branch-wise automatically, as it will be taken care by the system.

- Compare the prices – Cost saving:

There are different factors affecting the cost of the order for example

- Transport
- Local Taxation
- Offer stock etc.

Once the order is received by the company, Sells person should be able to know from where the order should be process to enhance profitability and give best possible price.

- Bulk order process automatically- Without manual intervention:

Saved order which is required per month or weekly from regular customers can be saved and executed quickly. Order should be placed via- sending an excel sheet or placing it on internet URL.

- Inter Branch transfer of Items:

Due to warehouse limitations or for logistic and tax reason or for safety purpose Items needs to be moved from one warehouse to other. This case is very crucial to handle as stock should be exactly tally and Inventory should be maintain correctly. This should be handled by the system.

- Eliminating Integration:

As the global database is maintained on the cloud, there is no need to write integration for different branches. In present situation as there is no direct communication between different branches, separate integration system needs to be maintained which should be eliminated using proposed system.

- Auto Pilot mode for managing “Complete range of product all over the globe”:

As daily orders are process, the items can go out of stock and needs to be re-filled for future. This should be done again for all the branches. System should support

- Automatic triggering of re-fill order for items which are below defined threshold level.
- Received on time, before it goes out of stock
- Placed in the same location

This will put the system on auto pilot mode and will no longer require a manual check.

- In – Depth knowledge of the inventory / Reports:

Most important part of the business knows the detail analysis. Different reports needs to be provided to show availability of selected Item, Its business per branch, per Item, per quarter etc. and with combination of each other. This helps in logging and taking decisions for improving business and profitability.

- Cloud based system - Orders can be placed from internet:

As the data will be available on internet and systems are cloud based, Orders can be placed from anywhere in the world. This gives the freedom of operation irrespective of location. Person need not to be present physically in the branch for taking the order.

- Easy Taxation, Transport management:

Taxation and transportation are most tricky part of the system as both are dependent on geographical location. System should automatically calculate tax and shipment charges based on the selected branch and shipping address. All documents and prints required for the transport e.g. L.B.T. and invoice order should be printed and available with the Transport Carrier.

II. LITERATURE SURVEY

[A] Impact of ERP Systems on Small and Mid-Sized Public Sector Enterprises. (Ashim Raj Singla, 2005 - 2008 JATIT)

Says that Enterprise Resource Planning software systems (ERP) encompass a wide range of software products supporting day-to-day business operations and decision-making. ERP serves many industries and numerous functional areas in an integrated fashion, attempting to automate operations from supply chain management, inventory control, manufacturing scheduling and production, sales support, customer relationship management, financial and cost accounting, human resources and almost any other data oriented management process. ERP systems are designed to enhance organization's competitiveness by upgrading an organization's ability to generate timely and accurate information throughout the enterprise and its supply chain. A successful ERP system implementation can shorten production cycles, increase accuracy of demand for materials management & sourcing and leads to inventory reduction because of material management, etc. Moreover it can be used as a primary tool for re-engineering. However various studies have revealed that not all ERP Implementations are successful. According to Gray A. Langenwaller (2000), ERP implementation failure rate is from 40% to 60%, yet companies try to implement these systems because they are absolutely essential to responsive planning and communication. The competitive pressure unleashed by the process of globalization is driving implementation of ERP projects in increasingly large numbers, so a methodological framework for dealing with complex problem of evaluating ERP projects is required.

[B] Enterprise Resource Planning: An Open Source System (Anand Kr. Shukla, Ajay Indian member IEEE, Dec 2013)

Says that ERP systems have assumed great importance in the IT sector because it offers myriad benefits which include sales forecasting, centralization of data, order tracking, decision support, competitive edge, and many more. To achieve all such kinds of benefits, FOSS (Free and Open Size Systems) are gaining importance in the IT industries. The main objective of this research paper is to study how well Open ERP Systems can be implemented on SMEs. This research paper aims to throw light on how ERP systems can be implemented on SME'S. Enterprises, carefully analyzing three things ; one :The model of Free and Open Source Systems has been refined over the years , how that change will affect the future development of ERPs ,two : The business environment for SME's has become more complex through globalization, resulting in a need to develop more advanced technology ,

three :challenges faced by the ERP vendors while developing such an ERP for SMEs. The backbone of this research paper lies on the ERP systems and FOSS(free and open source system).Due to the advancement of technologies in the IT sector, ERP systems have been widely used because of their benefits which include efficiency, cost saving, flexibility and majorly competitive advantage. Open source ERP vendors offer affordable price for the development of the systems. Open source ERPs are suitable for SMEs as well as large organizations. In general, Open Source refers to any program or software whose source code and some other rights are made available for use or modification by others, under a software license that meets the Open Source definition of the Open Source Initiative (OSI) or that is in the public domain. Open source software is usually developed as a public collaboration and made freely available.

[C] Comparative Study of Open ERP and its Technologies (Navita Jindal, Kanwalvir Singh Dhindsa member IEEE, July 2013)

This review paper focuses OpenERP as Open source alternative to Enterprise level implementations for small to mid-scale Enterprises (SMEs) and how open source ERP development can affect these enterprises. The paper will discuss core technologies and methodologies that are necessary for low cost ERP implementations in SMEs. Enterprise Resource Planning (ERP) software comes as a suite of utilities that divides business processes broadly into the following conceptual areas in order to make the structure of very complex software manageable, manufacturing, supply chain, financial, project management, human resource management and customer supplier relationship management. In other words, there's something for everyone who is involved with the company's management. As Enterprises mature and their requirements grow more and more functionalities are added to the system which results in increased complexity of the ERP software and implementation. Open source ERP is accountable for the organizations seeking continuous adoption of the software to changing processes and needs.

OpenERP released under the AGPL license features Project Management, HR, CRM, Sales, Accounting, Manufacturing, and Inventory. OpenERP uses a three-tier architecture written in Python [6]. The application tier is written as a core and multiple additional modules that can be installed or not to create a particular configuration of OpenERP. The functionality of a module is exposed via XML-RPCs. Modules can insert data in the database during installation by providing XML or CSV or files.

[D] Organizational memory and the completeness of process modelling in ERP systems (Eveline Van Stijn, Anthony Wensley IEEE member, 2001)

This paper focus on problems that may arise after enterprise resource planning (ERP) systems have been implemented ± the in-use phase as we will refer to it. Various problems can be identified regarding the ERP systems in use. Because of the organizational unwillingness or inability to make technology upgrades (Markus and Tanis, 2000), the enterprise system may take on the appearance of a legacy system in disguise.

Furthermore, the users may still be working around the system or maintaining old procedures, instead of learning the relevant ERP capabilities (Marcus and Tanis, 2000). These problems are not only technological and organizational in nature, but they also involve cognitive aspects, such as adjusting existing work methods, mental models, and data-models. Hence, to solve the problems and enhance the ERP system successfully, it is necessary to view the ERP system in a broad sense, including technological, organizational, and cognitive aspects. Focus in this paper on the knowledge that relates to processes. Such knowledge may reside in many places within the organization. Some process knowledge is embedded in the way the activities that constitute processes are structured both temporally and spatially. Other knowledge may be recorded in process manuals that may record "ideal" type processes as well as details of the functioning of processes on a regular basis. Yet other knowledge may reside in the heads of individuals who work directly with the processes themselves or in automated activities or sub-processes of the process concerned.

[E]Customer Relationship Management (CRM) in Enterprise Resource Planning (ERP)(MEHUL PATEL, DR. R. M. JOSHI IEEE member, June 2014)

Says that the importance of Customer is not limited to the Marketing function of an organization but now it is omnipresent variable in any Organization. Organizational planning is mostly Customer centric and through which it is profit centric. Major larger organizations deals with Customer Relationship Management with Enterprise Resource Planning (ERP) for accomplishing desired success, organizations continuously strive for increased sales performance, superior customer service and enhanced customer relationship management. To achieve these objectives you need solutions that provide rapid access to centralized customer information. You should also be able to access detailed and up-to-date communication history to foster customer and prospect relationships, close sales and streamline all customer contact activities. Resource ERP offers consistent and readily available customer and prospect data, allowing you to manage pre-sales activities, perform automated sales processes, deliver consistent customer service, evaluate sales and service successes and identify trends, problems and opportunities. The resource ERP CRM Software module helps you know your customer better and includes many features such as activities, history, related contacts, addresses of your customers and their relations with your competitors. The flexible database structures enables you whatever information you would like to keep on your customer and maintains such information for your future reference.

III. PROBLEM STATEMENT

The company having large network of distributors, super stockiest and retailers. Also having sales team, purchase team to manage all the transaction. Currently all these companies are sharing their data in the form of files via emails or telephony conversation. But human interaction may lead to problems like unavailability of files, inadequate data etc. All these problems lead to the need for an integrated System such as Supply chain management ERP solution. They are having requirement of a Supply chain management ERP solution for their various

management and production processes. Because there is no central location for the database, transactions are scattered which leads to below problems.

- 1) Duplication of data and efforts and inconsistency.
- 2) Manual intervention is required as users are scattered geographically.
- 3) Time required to process the order is longer.
- 4) Reports or analysis is very difficult to achieve.

If the owner of the company is not having proposed cloud based ERP, he/she will face loss of business as quick orders can't be processed and would end-up recruiting sales representatives to process orders.

In the proposed system services are exposed using cloud deployment so that they can selfservices i.e. they can placed their own order anywhere from the world using internet or mobile phone through services provided.

- Placing a new order
- Manage and track order status
- Cancel the order
- Request for quotation

Company have different branches need to integrate cloud based ERP system as this is manage on cloud. Centralized monitoring and centralized transaction eliminates the need of integration and give detailed analysis of overall company and branched individually.

IV. PROPOSED APPROACH

Supply chain management ERP solution is an integrated computer-based system used to manage internal and external resources including tangible assets, financial resources, materials, and human resources. It is a software architecture whose purpose is to facilitate the flow of information between all business functions inside the boundaries of the organization. An Distributed Cloud Based Business Management System can either reside on a centralized server or be distributed across modular hardware and software units that provide "services" and communicate on a local area network.

A. Client:

In Supply chain management ERP solution, Client is business entity for which all the business activities are going to be tracked. In Supply Chain Management ERP Solution we can create multiple clients for customer who is having multiple business or companies. Each business can have separate client to tracks its activities independently without disturbing each other. Each client (company) can have different standards and processes to manage their activities. We can customize all the processes for each client separately without disturbing each other's implementations.

B. Organization/Company:

Organization is entity within client. Means one business can have multiple legal entities, for which they are managing separate accounts.

C. User:

User is a person who is going his activities within application, i.e. employee can manage his daily activities or tasks, manager

can view reports or plan his activities, view the status of his orders, payments etc.

D. Role:

Role is responsibilities defined for the user, It controls the authorities or access within application. i.e.

Administrator – will have access to the ERP configuration module.

Accountant – will have access only to the Finance management module

Sales Representative – will have access only to the Sales management module

Manager – will have access to view all the reports etc...
 Role is especially user for security purpose.

V. MODULE HIERARCHY

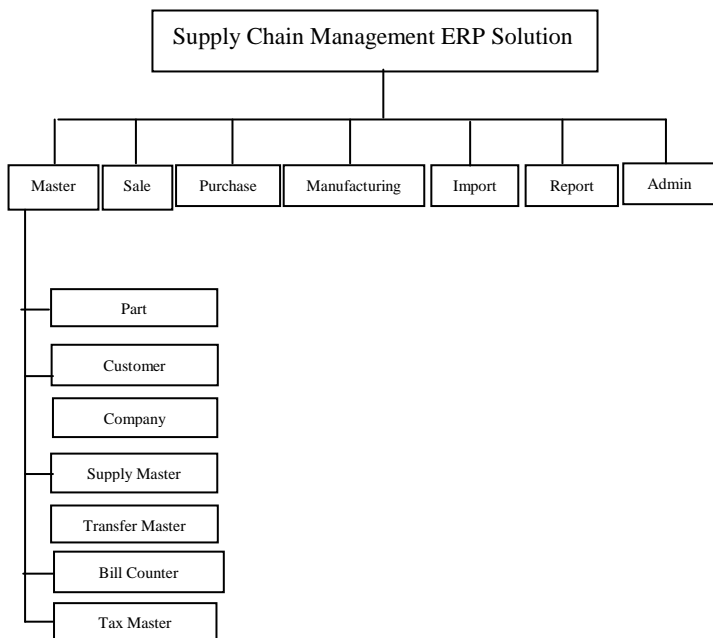


Figure: This figure describes the main modules of system.

VI. CONCLUSION AND FUTURE WORK

This system is developed by using java. It is menu driven so very easy to handle any user can operate the system by using menus and sub menus.

Salient features:

- Easy to understand:
 The structure is so simple so it is very easy to understand whatever done by us.
- User Friendly :
 We add all details about each field so user can easily handle with less bugs.
- Less complex :
 It has all information in simpler form so user have no complexity to run.
- Time saving :

Using our software user can do his daily activities within minimal time instead of Manual work.

FUTURE WORK

- Integration of Advanced Dynamic Reports.
- Human Resource Module will be added.
- SMS facility in the system will be added.

VII. OUTPUT SCREEN SHOTS

1. UI SCREEN : MAIN MENU



This UI screen is the home page of web application it shows the list of part register with system.

2. MASTER MENU



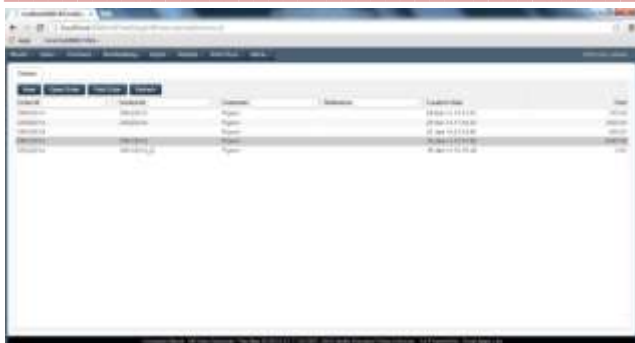
This UI shows the list of modules which comes under master configuration and only accessible to administrative users.

3. SALES MENU



This UI shows submenu of sales

a. UI Screen : Sale order



This UI shows all sales orders. User can create new order, open order, print order and refresh order.

b. UI Screen : Create sale order



This UI will be used to create sale order. User select part and quantity others fields are auto populated like Rate,Discount, Tax, Total... etc. User can print this order or export this order.

c. UI Screen : Tax Invoice



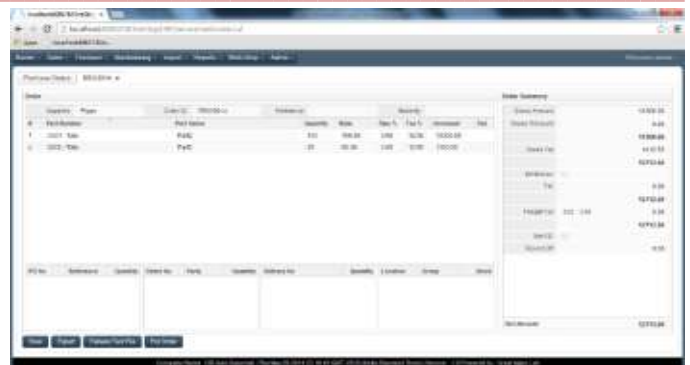
This UI shows all sale tax invoices. User can create invoice by selecting sale order. User can open invoice, print invoice.

4. PURCHASE MENU



This UI shows submenu of purchase.

a. UI Screen : Purchase order



This purchase form used to maintain information about purchase transaction. User can save, export and put purchase order from here.

We have also provided following functionalities related to purchase

- b. Pending orders
- c. PO from finish items
- d. Purchase bill
- e. Purchase returns

5. MANUFACTURING MENU

a. UI Screen : Work order



This UI will be used to create work order. We have also provided functionality to configure manufacturer parts and below of material (BOM).

6. IMPORT MENU

- a. Import Transaction
 Import transaction using exported transaction xml.
- b. Import Purchase Delivery
 Import purchase delivery sends by vendor/supplier. Purchase delivery sends in the form of excel file.
- c. Import Price List
 Import price list for parts.

7. REPORTS MENU

Stock Reposts by Brand

Item Name	Qty	Price	Total
...

We also have given following reports

- ✓ Sales Report
- ✓ Purchase Report
- ✓ Stock Reports
- ✓ Transaction History by Items
- ✓ Complete Stock Reports
- ✓ All Items transaction History
- ✓ Pending Items by party
- ✓ Purchase Items by supplier

8. ADMIN

a. UI Screen : Users



Admin will use this UI to add user account so that those users will have access to the OpenERP system.

VIII. REFERENCES

- [1] Rouse, Margaret. "ERP (enterprise resource planning)". TechTarget. Retrieved July 14, 2015.
- [2] Bidgoli, Hossein, (2004). The Internet Encyclopedia, Volume 1, John Wiley & Sons, Inc. p. 707.
- [3] Rubina Adam, Paula Kotze, Alta van der Merwe. 2011. Edited by Runtong Zhang, José Cordeiro, Xuwei Li, Zhenji Zhang and Juliang Zhang, SciTePress. , p. 229 - 238
- [4] Shaul, L. and Tauber, D. 2012. CSFs along ERP life-cycle in SMEs: a field study. *Industrial Management & Data Systems*, 112(3), 360-384.
- [5] Khosrow-Poor, Mehdi. (2006). Emerging Trends and Challenges in Information Technology Management. Idea Group, Inc. p. 865.
- [6] "A Vision of Next Generation MRP II", Scenario S-300-339, Gartner Group, April 12, 1990^[third-party source needed]
- [7] Anderegg, Travis. "MRP/MRP II/ERP/ERM — Confusing Terms and Definitions for a Murky Alphabet Soup". Retrieved September 23, 2013.
- [8] "ERP". Retrieved October 7, 2009.
- [9] Chang, SI; Guy Gable; Errol Smythe; Greg Timbrell (2000). *A Delphi examination of public sector ERP implementation issues*. International Conference on

- Information Systems. Atlanta: Association for Information Systems. pp. 494–500. Retrieved September 9, 2008.
- [10] *Thin Enterprise Resource Planning* (Second Ed.). Boston: Thomson Course Technology. 2006. ISBN 0-619-21663-8.
- [11] "ERP: What you need to ask before you buy". Projectauditors.com. Retrieved April 23, 2014.
- [12] "The Bryan School of Business and Economics at UNCG— Exceptional Problem Solvers" (PDF). Uncg.edu. Retrieved November 8, 2012.
- [13] Ramaswamy Niles V K (September 27, 2007). "Data Migration Strategy in ERP". Retrieved April 8, 2008.
- [14] Monk, Ellen and Wagner, Brett. "Concepts in Enterprise Resource Planning" 3rd ed. Course Technology Cengage Learning. Boston, Massachusetts. 2009
- [15] "Enhanced Project Success Through SAP Best Practices – International Benchmarking Study". ISBN 1-59229-031-0.
- [16] "ERP (Enterprise Resource Planning)". Tech-faq.com. March 5, 2014. Retrieved July 14, 2015.
- [17] "Critical Issues Affecting an ERP Implementation". *Information Systems Management* 16 (3). Auerbach Publications. 1999. p. 7. Retrieved January 10, 2013.
- [18] "Wal-Mart slow to roll out new replenishment system". Arkansas: Thecitywire.com. January 8, 2014. Retrieved July 14, 2015.
- [19] Montgomery, Nigel (2010). Options. "Gartner Group. July 28, 2010. Retrieved September 20, 2012.