INVESTIGATION OF DATA FLOW IN AN ERP ENVIRONMENT

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Abstract:

This paper presents a disseminated Enterprise Resource Planning System under innovative deployment considerations thereby investigating the data flow in an ERP environment. This deliberation includes complex data modeling, optimization of several demand chain models, and disseminated applications deployment. The results can be characterized in two folds, information system procedures in support of a distributed ERP system, and procedures that adjust the intentions of manufacturers using the ERP system. The contribution to the information system feature includes new architectures, web based mechanisms and tools, and an ERP system that can be used as a standardized tool. This advance from the new competences of the ERP system and help to improve the planning and operation of the target manufacturing systems.

Keywords: Procurement, data flow, information Technologies, deployment, distributed supply chain management.

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1. Introduction:

The fame of ERP systems has been gradually increasing within the contemporary manufacturing world [Wagner, 2001; Wilson, 2001; Kemp, 2001; Whiting, 2002; Data monitor, 2002]. At the same time, ERP systems have grown-up in size and intricacy to a point where long training and installation phases are essential before the classifications become dynamic. In order to support both training and productivity of ERP systems, this study explores the data flow within the value-adding tasks of the ERP system in support of modern business methods. Modern manufacturing organizations depend on on joined information systems to manage the intricate relations between the chain of dealers and customers. At present, these systems, termed ERP systems (Enterprise Resource Planning), consist of extravagant database systems that have the tenacity of hoarding a large amount of information. These systems however, lack a general vision of integrating the several players in the system opening with the market demand and ending with the last supplier.

This study, hence, develops an ERP system that can be used to improve better methods and control procedures for an augmented manufacturing supply chain system. In this study we examine the data flow activities in an inclusive disseminated ERP test-bed created by using Commercial Database and several front-ends and middle-ware application servers. The scope of the study is an emphasis on a disseminated supply-chain environment in which the procurement processes often. It presents a flexible hasty business-logic modeling technique to quickly alter the procurement progressions on mandate and re-create the data flows within the volatile supply chain environment. The study examines the relationships between the data flow and the functional flow of the events. Also, the model generates new disseminated process-logic components that can be changed/altered and then reprocessed under different obligation. The results of this study comprise a new functional flow and design policies that allow rapid access to critical information, reduced remodeling time, and more precise study of the data on both strategic planning and operation levels.

2. Erroneous With the Existing ERP Systems:

Presently, there are more than two dozen first-rate commercial ERP systems such as PeopleSoft, SAP, Oracle ERP, and i2 supply chain management system. These ERP systems generally have the following features; ERP systems are usually complex and only suitable for multi-national corporations, who need centralized controls over a distributed information infrastructure. The initial cost to implement such a system is usually prohibitively high for even mid-size company. For example the initial cost for the hardware and software alone is approximately $1 million for the SAP ERP system (providing just the basic ERP functionality).The implementation of these basic ERP systems usually requires from 6 months to 2 years. It is not unusual that during this period, companies which implement these ERP systems may need to run two ERP systems concurrently; the existing system and the new system. This implies not only extra human resource involvement, with additional trainings and costs required, but also results in tremendous management burden needing to keep up with two parallel systems.

The costs involved in implementation and deployment is usually 200%-300% of the cost of the ERP system. The implementation and deployment could heavily involve consulting / technical services from external entities. This added cost could significantly impact the cost management and control of the implementation and deployment project. Due to the complexity of these commercial systems, companies frequently find themselves adopting the business logic / models defined by the software systems, rather than customizing the ERP system to fit the best business logics. When organizations need to change their business models or operation logics, it usually takes long time to implement the changes in the ERP system due to the complexity of the system. It could also means that implementing these changes may require or involve outside consulting works. The results may very well imply that the organization will suffer loss of control over the deployment agenda and in turn the competitive edge. The agility in implementing dynamic business logics and models could be the only survival line for many fast pace industrial sectors such as the high-tech.

3. Tricky Statements:

This paper presents an integrated demand chain manufacturing enterprise resource planning system over a distributed environment. The project consists of two main research phases: the development of innovative ERP system, and the research development of related methodologies which address the issues in the area of optimization, information technology, data warehousing and embedded man-machine interfaces. The first task is focused on the development of the prototype Enterprise Resources Planning System as the infrastructure establishment phase of the project. In this phase, a fundamental database server and an application server are development based on distributed data warehousing development strategy. This innovative strategy not only allows the small- to medium-sizes companies to implement this infrastructure, but also provides an agile implementation methodology to adapt to today's frequent changes in corporation business models. The objective is to produce at the end of this project a lightweight, flexible, and low-cost ERP system, which will fit the real-world's needs. The second goal of the paper is aimed at the research and development of real-time resource planning algorithms in the area of engineering logistics, procurement management, demand chain management, and human-machine user interface design. According to the study, the current research works on ERP are mostly in the area of supply chain management. The supply chain management focuses on the collaborations between the original equipment manufacturers and the distributors. Although, it is an important strategic tool for many companies which outsource their manufacturing functions to external suppliers, it falls short of representing the reality.

A most important part of the supply-chain was largely ignored in the equation "the customer's demands". In the current dynamic economics, the fluctuations of the market demands are the major decision factors in the distributed ERP systems. As an example, market networking technology leaders Cisco and 3COM mistakenly predicted the market's demands of networking products from Q2 of 2000 to Q3 of 2001. This miscalculated market demands because both companies to suffer from 8-12 months of excessive inventories, even though both companies had highly precise supply chain management systems in place. With the demand factors never integrated into their ERP business models; both companies suffered multi-million dollars losses of profitability as well as losses of their stock value. This example demonstrates the deficiencies

of the existing commercial supply chain management systems. In the proposed methodology, the study focus on the modeling of the market demands as the main trigger or the pulling force of the entire demand chain system. In this model real-time demands or it's near real-time demand forecasting (e.g., on an hourly basis) are collected into the centralized demand monitor system, and the subsequent operational decision are then triggered based on this real-time information. Based on this major assumption, the entire demand chain system is then driven by the customer demand, including automated logistic / distribution logics, procurement process, inventory replenishments, production scheduling, product-mix decisions, and real-time supplier selection based on capacity and scheduling concerns. These interesting but challenging research tasks not only can broaden the scope of conventional supply chain systems but also can real help up-stream manufacturers to minimize their production risks in a dynamic and fluctuated market environment.

4. The Demand Chain ERP Infrastructure:

4.1 The ERP System Model:

The ERP model is developed by the three-tier architecture as shown in Figure 1. The database server consists of an Oracle database that includes the following domains: accounting, customer management, inventory management and bill of materials, supplier's management and order management. The applications server runs Visual Basic applications that manage the data retrieval and presentation to the users. In addition, the Visual basic applications can manage the analysis of the ERP data and generating action policies that optimize the system's performance. The database server resides on a dedicated computer running Windows NT and connected to the Internet as well as an Intranet. The application server resides on a separate computer again with connectivity to the Internet and the local network. The User computers are regular computers running Windows 98 and connected to the network.

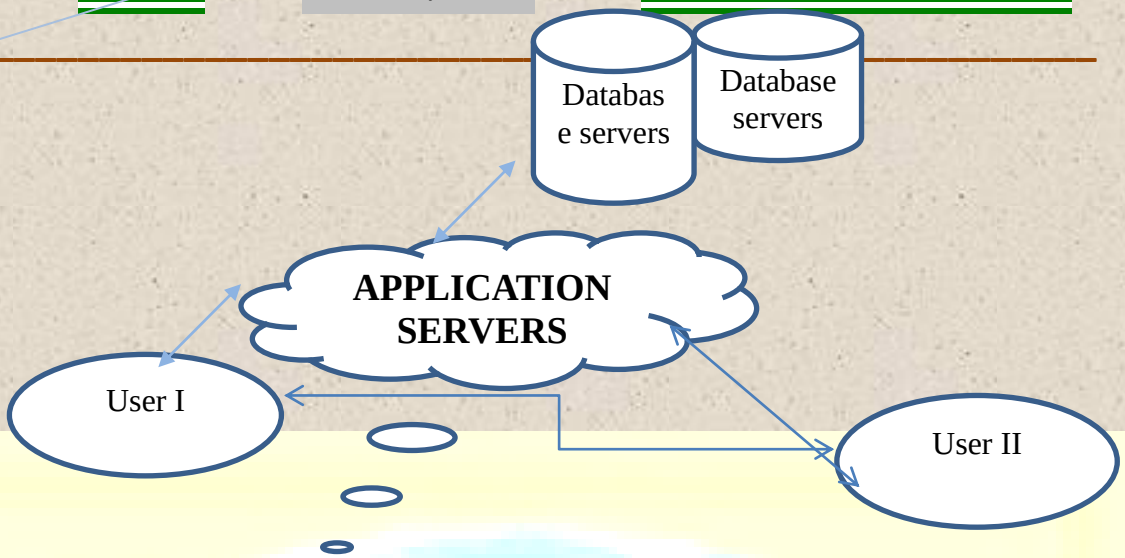

Fig: 1 Three Tier Architecture

4 .2 Logical Modeling in Supply Chain System:

There are a number of ways of analyzing the supply chain - and of managing the operation of it. One of the most useful is the node and link model, which plots links - usually representing movement over distance -and nodes - places where goods are stored or processed. This model is useful as it provides a representation of the overall shape of the supply chain, which can then be 'exploded' into greater detail. In our analysis we use two analytical methods to model supply chain networks: network design, and performance analysis methods. The network design models help in strategic and tactical decision making. They are basically mixed-integer programming models and are used to decide what products to produce and for what markets, where and how to produce them, and using what resources. Performance analysis of supply chain network is basically conducted to determine the lead time, variation, cost, reliability and flexibility of the system. Supply chain networks are discrete event dynamic systems is which the evolution of the system depends on complex interaction and timing of various discrete events such as the arrival of components at the supplier, the departure of a truck from the supplier, the start of an assembly at the manufacturer, the arrival of the finished goods at the customer, payment approval by the seller, etc. The state of the system changes only at discrete events in time. In this research in addition to the experimental ERP platform developed, we will present several analytical models of the ERP system using both approaches.

5. Values of Sharing Data in a Demand Chain Atmosphere:

5.1 Synchronization in Supply Chain:

Coordination addresses the problem of integrating decisions of different activities, such as facility location, production, and distribution. The coordination is classified into three main categories: coordination between supply and production activities, coordination between production and distribution activities, and coordination between inventory and distribution activities. The work conducted results in several models for representing this coordination, and analyzing some of its properties such as delays of information flow and value of sharing correct information.

5.2 Buyer-Vendor Harmonization:

The supply chain instigates with the procurement of raw materials or subassemblies. It is common for raw material and subassembly purchases to account for over 50% of the cost of sales. The harmonization could be enhanced by investing in material handling equipment or data exchange technology, such as electronic data interchange (EDI). Also firms can improve the coordination by using an order quantity that is jointly optimal for the buyer and vendor. The two sides must then negotiate to regulate how to share the savings

5.3 Production-Dissemination Coordination:

There are only a few models that attempt to address these coordination problems simultaneously. There are certain descriptions for that. First, many problems in this area are tremendously hard to solve by themselves, both vehicle routing and machine scheduling fall into this category. Second, in practice these problems are often separated by inventory buffers. Finally, different departments are often responsible for these planning activities.

6. Conclusion:

Thus the study presents a scattered Enterprise Resource Planning System under innovative distribution considerations thereby investigating the flow of information in an ERP system. This

negotiation includes complex data modeling, optimization of several demand chain models, and distributed applications deployment. It concludes by bringing relationship between data flow and functional flow thereby generating new distributed components that can be altered and processed under different compulsion. It brings new functional flow and design procedures that permit to rapid access to critical information.

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