Synchronization of Enterprise Resource Planning (ERP) Modules in Product Lifecycle Management (PLM)

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Abstract: - **To synchronize one or more ERP Modules in the Product Lifecycle Management (PLM) based organizations is a difficult process. There are many factors that will affect ERP system implementation leading to its achievement or malfunction in the organization. The lack of communication between Product Data Management (PDM) systems, that make fundamental product development, and Enterprise Resource Planning (ERP), which manages real product, cannot lead to a global description in development process of product. We demonstrate that a mediator approach is pertinent for the coordination of these two systems. The continuing study is an effort to understand how and why different factors impeded successful ERP synchronization in an organization that outsourced the development and implementation of ERP system to a multi-national company. The end part of this study will conclude how effectively these ERP modules will help the modern global economy, companies which are facing ever-increasing challenges for short time-to-market to enter into the market early.**

Keywords: Enterprise resource planning (ERP), Product Lifecycle Management (PLM) and ERP V/S PLM.

1. INTRODUCTION:

For continuous improvement and to maintain ongoing competence in market an organization should overcome the complexity in the development of new products in industrial company's leads to many issues. Complexication is understood here as the multiplication of partners (subcontractors, suppliers, customers located all over the world), the stronger integration between the actors of a project (design, production, marketing, maintenance etc.) as well as the huge amount of data produced, exchanged and stored during the development phase. Furthermore, although the economic environment is very constraining, the main goals remain to reduce the time-to-market, the costs, and improve the product quality. One of the major concerns in today's globalization is the transformation of countries like India or China. 'More than any other country, India is being changed by its use of IT, from a poor and isolated society to a major force in the worldwide market.' What makes India a somewhat special case is the great variety of ownership structures including state-owned, foreign invested and privately-held companies? That is, the role of ownership can be studied in relatively greater depth there than elsewhere [1].

The emergence of the PLM concept with the deployment of PLM systems has generated and generates yet important evolutions of the information system of the enterprises [2]. In fact, before the emergence of the PLM systems, the Enterprise Resource Planning System (ERP) has been the heart of the information system of the enterprises. This system focuses on process management of customer orders and the orchestration of all business activities (commercial, financial, procurement, logistics, production, etc.). To meet the specific needs of each activities of the enterprise, integrating business information systems for these activities has gradually been realized. Comprehensive studies related to the economical evaluation of information systems in general and those of ERP systems in particular still seem to be in their early days [1]. More specifically, if one cares about specific cultural and language barriers (including not even language differences but also considerations regarding character sets different from those used in most of the countries as they can be found related studies need to investigate additional aspects not yet included in general ERP adoption and innovation diffusion models [3].

2. DEFINITIONS

ERP: The term of ERP is originally derived from Manufacturing Resource Planning (MRP II) and Material Requirements Planning as ENTERPRISE RESOURCE PLANNING.

- It is an organizational computer software system used to manage and organize at all the resources, information, and functions of a business from shared data stores [4].

- ERP refers to a view of a company and all its parts as a connected whole, rather than small activity. It relates to the integrated software infrastructure that supports the entire company business process.
  PLM: Product Lifecycle Management (PLM) is the process of managing product related design, production and maintenance information.
- PLM is a powerful management tool, creating visibility all along production, facilitating communication between essential personnel, and collating the mountain of data that accumulates during design and manufacturing [5].
- The PLM tools can access the data and reports instantly and see the progress is being made by designers, contractors and suppliers. The PLM tools helps in saving the time and avoids confusion.

3. ERP VS PLM

ERP is used to manage the logistics of getting a product to market once a design is released. PLM largely referred as CAD-based is used to achieve control over design and development information.

ERP is a system which involves gathering information and tracking a business's resources throughout a calendar year or cycle. PLM is more focused on the creation and care of one product or product line in specific. The differences between ERP and PLM include how the process is completed—one is primarily software-based and the other may involve a team of people—, what each is used for and how each one is reported to improve business procedures. Both enterprise resources planning (ERP) and project lifecycle management (PLM) is important ingredients in a company's growth and ability to innovate. ERP and PLM differ in that enterprise resource planning is generally a digital application that manages a company's internal and external resources. ERP looks at finances, tangible assets, staff and inventory. The point of integrating this resource planning program is to ease the flow of vital information into every part of a business's functions and to facilitate its communication with external stakeholders. The ERP app generally runs on one common computer platform which helps organize the use of various vendor products. As always said in short *ERP* is an *Physical Property* and *PLM* as *Icmntellectual Property*

4. *Overview of ERP Module*

	SD	Sales & Distribution
	MM	Materials Management MRP
	PP	Production Planning MRPII (with others)
	QM	Quality Management
	PM	Plant Maintenance
	HR	Human Resources
FINANCIAL	FI	Financial Accounting
	CO	Controlling
	AM	Asset Management
	PS	Project System
R/3 INTERNAL	WF	Workflow: prompt actions
	IS	Industry solutions: best practices

Table 1: Overview of the ERP module.

In software a module is a part of a program, and programs are composed of one or more independently developed modules that are not combined until the program is linked. Each ERP module is focused on one area of business processes, such as product development or marketing. Some of the more common ERP modules include those for product planning, material purchasing, inventory control, distribution, accounting, marketing, finance and HR.

ERP (Enterprise Resource Planning) software typically consists of multiple enterprise software modules that are individually purchased, based on what best meets the specific needs and technical capabilities of the organization.

5. METHODOLOGY

A quantitative research approach was adopted to explore the impediments of ERP systems. In 2009, the researcher conducted a survey on a group of executives from 150 enterprises over 20 provinces in India. The researcher received some 79 usable returns. Ten were from large SOE while the remaining was from SME. [1] The major findings are related to CSF, ERP benefits and ERP obstacles. The major ERP benefits are related to SCM issues and constitute related benefits as cost reduction, business strategies' support and alike. Among the CSF he

concludes that executive support is the key success factor for ERP, followed by SCM as an important component and BPR as another CSF. Moreover ERP is more of a concept than software. ERP obstacles are found around common challenges such as 'ERP is too expensive' or 'ERP is too complicated' as well as some firm specific challenges. In that respect main obstacles seem to be IT infrastructure in India, lack of well-trained workers, lack of incentives at SOE, and differing corporate culture.

Additional studies with independent results can be found as follows. For instance reports about a questionnaire which was published in an ERP professional website and mailed to the listed companies in the Bombay stock exchange. Depending on the questions between 90 and 118 responses were accounted for as useful, i.e., according to the source 90 enterprises have completely finished or partly finished their ERP implementation project. Among those companies about 81% used external consultants during the ERP adoption. Among the possible consultants the vendor's consultants were mostly selected and they were involved in at least 50% of the work.

6. PLM/ERP Implementation Issue

Running a business with solely an ERP system will result in a gap in the manufacturing process. Companies with only an ERP system in place often struggle to organize one of the most important parts of the business, the product record. Additionally, the resulting scrap and rework around the product in the office and the shop floor is often quite costly. By implementing a PLM system beforehand, an organization can be confident the product information is being accurately managed and the ERP system is working with effective data.

Because ERP systems are designed to read the BOM for transactional purposes only, most lack effective change functionality and are not conducive to departmental collaboration around the product record. Change history documentation is vital to understanding which change has occurred and when the change went into effect. Engineering departments also require accurate change history information to track design changes and collaborate around product data.

Ultimately, an organization that implements an ERP system without a complementary PLM system risks mismanaging product changes and conducting inaccurate financial planning. Organizations utilizing less robust solutions like Excel to manage BOMs and changes also put a company at risk for costly errors.

Manufacturers that begin with an ERP system and then implement a PLM system can face various challenges to effectively manage the product record. For example, an engineering team without access to a PLM system to centralize designs and track revisions risks submitting inaccurate product data to an ERP system.

By managing product documentation and revision changes in a PLM system and then syncing final product data to an ERP tool, companies can avoid wrong part ordering and prevent inefficient spending. Product recalls and violating compliance regulations are other issues that can arise when product data is not first managed in a PLM system.

Synchronizing data and building a data connection may also be more cumbersome for a company when it implements a PLM system after an ERP system is already up and running. The time and money it takes to determine what product data should migrate from an existing ERP system to a PLM system are much better spent elsewhere in the production process. By storing product data in a PLM system and then migrating to an ERP system, a company will enjoy a more cohesive and efficient manufacturing process with fewer oversights.

7. CONCLUSION:

ERP systems and PLM systems have distinct functionalities which, when used together, give an organization complete control over its manufacturing processes. These tools, however, are not interchangeable. An ERP system helps a company manage the transactional activities around building a product, while a PLM system tells the story of a product at a specific point in time and the history of the product record.

Establishing your manufacturing process with an effective PLM system before integrating with a compatible ERP system will minimize organizational inefficiencies and transition costs as well as optimize the capabilities of each system across the entire organization.

8. REFERENCES:-

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