

# NEED OF IMPLEMENTATION OF PLM IN INDUSTRY

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## 1. Introduction:

Enterprise, today are facing a rapidly changing environment. They can no longer make predictable long term provision. To adapt to this change enterprise need to evolve and to be creative. Change and adaptation should be natural dynamic state rather than something occasionally forced onto the enterprise. This reactivity necessitates the identification of the core enterprise processes and the development of a discipline that organizes all knowledge that is needed to identify the need for change in enterprises and to carry out that change expediently and professionally. Integration of PLM (Product Lifecycle Management), SCM (Supply Chain Management), and CRM (Customer Relationship Management) is the key of success in business.

These three activities (SCM, CRM, and PLM) are so intertwined that the company has ideally to work on managing its supply chain, its product lifecycle organization and its customer relations in order to attain its economic objective evolve in the global market and assure its permanence in the socio-technical environment. Besides knowledge management could be a determinant factor to integrate enterprise key process and enhance their use. If supply chain the product lifecycle and the customer are proved to be key success factor in the enterprise.

## 2. Problem Definition:

- Among the company product development challenges, the need for shorter lifecycle time is always at the top.
- Management wants to be able to launch new models faster and reduce the time
- required for minor changes and development of product variants.
- Collaborate closely with its global team and supplier on the development of new Platform and product freshening.
- Streamlining the process of vehicle localization and enhancing quality and reliability.

## 3. Objectives of the Project Work (PLM Implementation):

By implementing PLM technology in an industry one can accept to achieve following objectives of the implementation,

- Lowering the cost of manufacturing of product.
- Integrate and managing those information across the boundaries
- of an organization.

- Achieve collaboration between departments.
- Increase speed of delivery to market.
- Make the reuse of knowledge.
- Manage explosion of design data.

## 4. PLM Is an Integrated Enterprise Model:

In this research we consider an enterprise "made of a large collection of concurrent business processes executed by a setoff functional entities (or resources) that contribute to business objectives. Managers need efficient tools for process modeling and integration to give them guidelines to conduct improvements in their organizations.

We are proposing to study the most important of these enterprise processes in order to enhance their performances, so following the classification [1], we are interested in the management of three core business processes: supply chain management (SCM), product lifecycle management (PLM) and customer relationship management(CRM).The paper of Shrivastava et al. [1] is focusing on supply chain management (SCM), product data management (the product data management discipline has evolved to PLM since that) and customer relationship management (CRM);it depicts the interactions between these business processes. This interaction is meant as follow: improving the enterprise efficiency with managing its Supply Chain, its Customers orbits. Product is almost related to working on the other enterprise factors.PLM and CRM are the enterprise front office and the SCM and ERP are the enterprise back office [3]. Improving the front office of the enterprise begins by working on its back office. Working on the back office impacts systematically the front office.

## 5. Definition of Product Lifecycle Management:

The past three decades have seen phenomenal growth in investments in the area of product lifecycle management (PLM) as companies exploit opportunities in streamlining product lifecycle processes, and efficiently using their data assets. The PLM processes span all product lifecycle phases from requirements definition, systems design/analysis, and simulation, detailed design, manufacturing planning, production planning, quality management, customer support, in-service management, and end-of-life recycling. [3]. Sothe PLM includes the steps of the design chain and aims at smooth it.

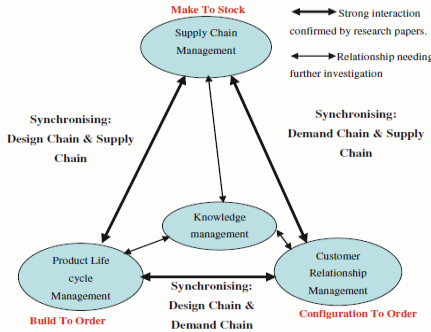


Fig. 1 An integrated enterprise model: interactions between PLM, SCM, CRM and KM models

**6. Definition of supply chain management:**

The Supply Chain is the set of procedures and software using for managing optimally the information flows, material flows and the interfaces between the different actors: suppliers, producers and customers that are related to the manufacturing of a product or the delivery of a service. All the data (from the customer requirement until the distribution scheme, through the conception and production) are gathered and used to build the supply chain [1]. Supply chain management, though, consists of monitoring,

Supervising and integrating all key business activities from the final customer down to the raw materials suppliers [3]. SCM is strongly related to customer relationship management (CRM), customer services management, demand management, order fulfillment, manufacturing flow management, procurement, product development and commercialization.

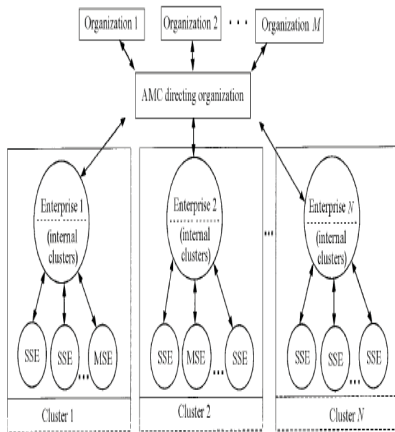


Fig 2 Supply Chain Management

**7. Definition of customer relationship management:**

Acquiring, retaining, and partnering with selective customers to create superior value for the company and the customer is the main objective of CRM.

Customer Relationship, in fact, is the “process that involves the development and leveraging of market intelligence for the purpose of building and maintaining a profit-maximizing portfolio of customer relationships”[2]. CRM allows companies to gather customer data swiftly, identify the most valuable customers over time, and increase customer loyalty by providing customized products and services [3]. Hence, CRM works on identifying and monitoring the components of the demand chain.

**8. The role of knowledge management (KM):**

Models are the way of visualizing, understanding and managing SCM, PLM and CRM processes. Usually an enterprise follows a general Business Model that determines “what the company does and how it makes money doing it”. The business model of a company includes details about its main product, how it is manufactured and how it is delivered. We can see the business model at the origin of using SCM models, PLM models, CRM models, and a combination of them or three of them. In fact, knowledge is an economic capital and a strategic resource in the enterprise, it provides a competitive advantage and insures a stability for the company as it deals with the strategies, the organizational structure, the whole set of processes, the human resources, communication and information technologies.

**9. Building a PLM model:**

The PLM model proposed in this article is meant to enhance the comprehension of the PLM vision. It is based on the previous research results and a literature review among the papers dealing with PLM. Our model is based on a semi-formal language, pictograms and symbols are organized according to the most important PLM principles, besides studying SCM and CRM models helped with structuring PLM concepts in a formalized way. First of all, the PLM model must keep track of the lifecycle phases of the product depicted. As pointed out by Stark, PLM is “the activity of managing a product across its lifecycle, from cradle to grave, from the very first idea for the product all the way through until it is retired and disposed of”. It is important for the company to have full details about the lifecycle. PLM existing models give a view of the lifecycle phases but the degree of details differs. In fact three important phases compose a product lifecycle: the beginning of life (BOL), the middle of life (MOL) and the end of life (EOL). But for a better understanding of the product, the enterprise must have more details about its lifecycle. Further PLM studies give a larger importance to the life cycle phases. June et al introduced design and production phases in the BOL of a product, maintenance, use and distribution in the MOL and finally remanufacturing and disposal in the EOL. Introducing different lifecycle models (such as GERAM Lifecycle model, STEP Lifecycle model...), Terzi opted for a detailed lifecycle model too based on four major steps: product development, product production, product use and product dismiss.

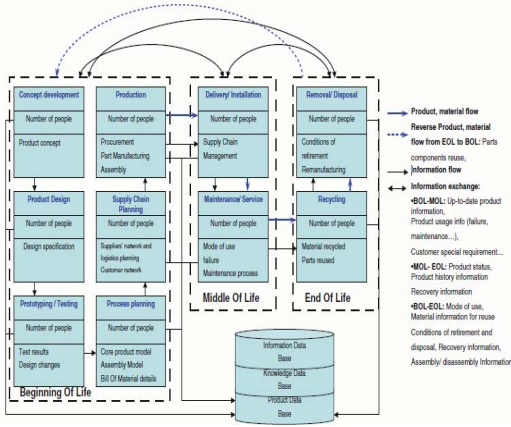


Fig 1 A Proposition Of a PLM Model

In PLM model we propose to give further details about each lifecycle phase ranged into BOL, MOL and EOL phase. Each phase is held into a box that shows at a first level the number of staff working on it and at the second level, the main result obtained. The use of these boxes including information about workers at each lifecycle step is similar to value stream mapping model in SCM where similar boxes are used to detail production step. The beginning of life includes the concept development, product design, and prototyping and testing, process planning, supply chain planning and testing. MOL includes delivery, installation, maintenance, and other service to customer. Material and product flow are added to the information flow exchanged in between different stages. EOL includes removal, disposal, recycling and the information and material flows in between these stages. Beside recycled material and product parts for reuse are ideally turned back to the first stage of product life cycle

### 10. PLM Software Requirement Catalogue

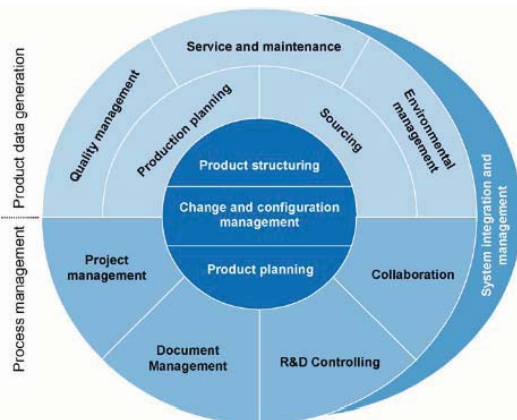


Fig 2 PLM Software Requirement catalogue

The existing PLM software solution vary in functionality depth and breadth, depending on vendor market focus, software origin and it’s evolution in the last years. In order to enable PLM software assesment in a common basic and enhance market transparancy, a vendor neutral PLM software requirement catalogue has been developed. The catalogue consist of four functional areas namely core data management, product data management, product data genration, process management and system integration. The function of core data management are product planning, product structuring, change and configuration management. Similarly the function of product data genration area of the catlounge are product planning, sourcing and quality management. The process management area is mainly focusing on project management, document management, collaboration.

### 11. Validation Of The Proposed Model:

Building a PLM model is essential to complete our integrated enterprise vision. But we have not addressed yet the validation of the proposed model. The validation methodology proposed will not only be used on the PLM model proposed. The objective is to prove the validation for the SCM, CRM model also. While validating the PLM model following attributes has to taken in to consideration,

**Saturation:** The set of the primitives offered to build the model are sufficient to depict enterprise system studied, that is to say there is no redundant primitives that can bededuced from another one.

**Simple:** The number of hypothesis or step made in to model has to be as simple and reduced as possible

**Exhaustiveness:** To avoid being misunderstood, we refer to use genericity, as this characteristics is not meant to have a model that depicts all of the possible cases but it underline the abality of the model to depicts at least more than single system. It is not hence,built specifically to an entreprise.

**Suppleness:** As the system describe are under constant change, the model has to be easy to change and offering engineering qualities accopmpany an enterprise through it’s evolution.

### 12. Result & Conclusion:

In the comparison of any two industry i.e. one with ordinary theoretical processing approach and other one is highly integrated product life cycle model approach, then always when we talk about cost, quality, business growth, value to share holder, process capability, time to market and market position the second one always lead to the first one.

It is all about managing the data in between various stages of product manufacturing like design, manufacturing, planning, marketing etc.

PLM implementation proposing a variety of tools that address different enterprise aspects like functional aspects, data information aspects, resources aspects.

In many manufacturing industry successful PLM implementation address the many business challenges like time to market, lowering the cost, avoid delay, data control.

Process coordination in between different management discipline like SCM, PLM, KM, and CRM tends to offer business growth.

**13. References:**

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