

PLM – BETWEEN CAPABILITIES AND SMEs NEEDS

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Abstract: PLM is a frequent discussed concept but also sometime very confused in enterprises expectation, especially for SMEs. There is a serious gap between PLM platform capabilities and enterprises implementations. Opinions of local industrial environment enterprises about PLM are presented as results of a market research.

1. INTRODUCTION

PLM (Product Lifecycle Management) is a concept frequent discussed today in research, educational and economical environments.

Among others, there are two main sources that helped the development of concept: management's needs to envelop all aspects of product lifecycle and collaborative evolutions of engineering software tools, under general acronym CAX.

Beyond PLM software capabilities and promises it exists and serious gap between enterprises expectations and implementation results of different solutions.

In this paper some aspects of PLM definition and evolution are presented, also the perception of small and medium enterprises of local industrial environment about PLM concept and their components, as results of a market research.

2. PLM DEFINITIONS AND ENTERPRISES DEMANDS

It is generally accepted that PLM covers all aspects of the lifecycle of product, from idea, design, manufacturing, use, maintenance, removal and recycling. There are several origins for definition proposed for PLM concept.

2.a) Management's point of view

From management point of view of PLM is an *integrated business approach*, based on information, made up of people, processes, practices and technology, covering, in order to increase efficiency and business productivity [6].

PLM not only provides process management throughout the entire product lifecycle, but also enables effective collaboration among networked participants in product value chain, which distinguishes it from other enterprise application systems.

In this sense, PLM is one of the five cornerstones of a corporation's information technology structure [3]:, *Enterprise Resource Planning (ERP)*, *Supply Chain Management (SCM)*, *Customer Relationship Management (CRM)* and *Human Capital Management (HCM)*.

2.b) Manufacturing's point of view

A PLM framework is based on information system that can access, store, serve, and reuse all the product information throughout the entire product lifecycle.



Fig.1. Systems of enterprise
Source: [8]

The evolution of PLM concept starts with Concurrent Engineering, initially aimed to increase productivity trying to precede simultaneously the traditional activities in manufacturing engineering. The original CIM definition from the beginning of the '80s introduced the idea of integrating the engineering and production systems and data [4].

After 1990, on has developed integrated solutions that embed CIM manufacturing, software products like CAE, CAD, CAM, CAP, CAQ, that have switched from individual productivity to team productivity. In the same time

The most common use of PLM seems to be about how to manage information, data and documents related to the design and manufacturing of products. Managing the product lifecycle in such a CAX-oriented scope signifies the handling of product versions, document versions for the needs of future design and manufacturing, as well as for spare parts and maintenance management of products that are in use.

It represents rather Computer-Aided technologies (CAX) oriented view of PLM []: PLM systems can access product information via Product Data Management (PDM) and obtain geometric descriptions from Computer-Aided Design (CAD) systems. Extending this point of view over the next product lifecycle stages, on obtain the most widest and optimistic definition of PLM, as shown in Fig.2 [7].



Fig.2. PLM largest vision
Source: [7]

2.c) Enterprises demands

Generally, enterprises expect benefits from the adoption of a PLM system in terms of profits like: deliver more innovative products and services in a shorter time, shorten *time-to-market*, comprehensive and collaborative relationship with customers, suppliers, and business partners, reduces costs etc.

Different studies indicate that PLM implementation is still on its initial stage, mostly focusing on partial aspects and still based merely on PDM software. The results have shown that there is a wide gap between the current implementation status and the PLM state of the art, especially at small and medium enterprises (SMEs) [3, 4].

PLM platforms delivered by SAP, IBM, Dassault Systems, and UGS are primarily used in the process enterprises and concerns (automotive, aerospace industry, machinery industry) [5]. Although PLM is meant to manage product information throughout the entire lifecycle of a product, the adoption of PLM is still mainly limited to product design, Fig.3 [5].

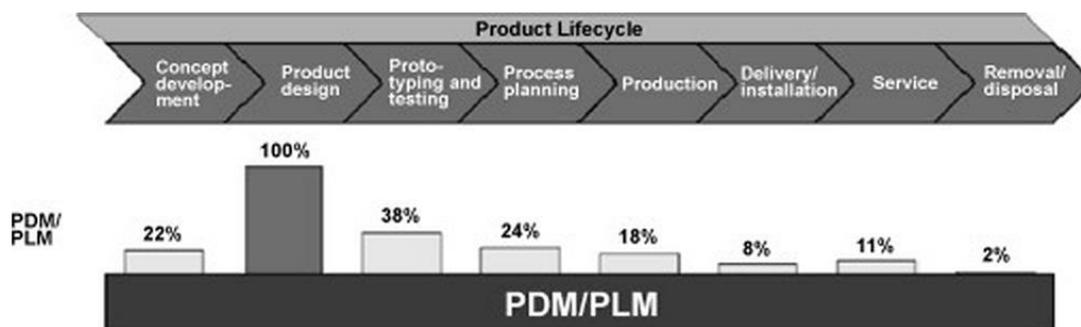


Fig. 3 PLM activities in SMEs
Source: [5]

3. PLM NEEDS OF LOCAL INDUSTRIES ENTERPRISES

Through market research proposed to identify research, development and innovation activities of local industry enterprise (Oradea, Bihor County) and in terms of PLM. The objective of this research was to identify industry needs and the importance of product life cycle to local firms [1].

Firms surveyed fall into fields such as textile industry (1), metallurgy (1), transport means (19), machinery and equipment (18), education (3) equipment industry electric (2), other (17, including: machining plastics, furniture, glass processing, auto repair, food, service, trade cars, construction equipment, transportation).

In the questionnaire were formulated questions about the product life cycle, like:

- *How important you consider the analysis of a product in terms of its life?*
- *How necessary do you think is the implementation of a product lifecycle management system (PLM)?*
- *Would you be willing to help to create a database in the product life cycle?*
- *What stage of the life cycle is important to your company's products?*
- *What impact has certain criteria on life cycle?*
- *How important do you think is the maintenance phase?*

Especially was followed way in which:

- a) firms are willing to collaborations with organizations or networks of professionals in research, development and product innovation and
- b) areas of interest through the stages of the product life cycle.

a) *Your company aims to solve some issues for research, innovation and development?*

1. Not at all
2. Some
3. Medium
4. Much
5. Very much

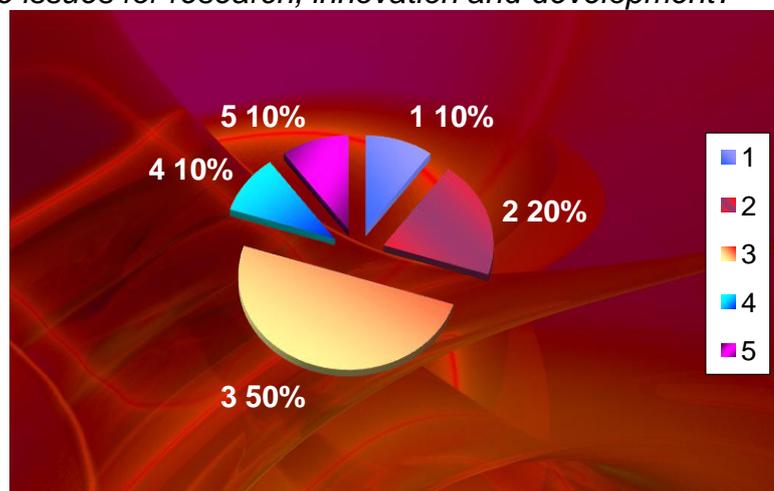


Fig.3. Collaboration interest

50% of firms surveyed responded, their intention is medium ranked solving issues, but only 10% on feel more based on these topics.

b) Your desired topics could also focus on field:

- a) Research
- b) Design products and technologies (including reengineering products)
- c) Manufacturing
- d) Operation
- e) Maintenance
- f) Recycle / reuse
- g) Industrial Environment
- h) Quality
- i) Other

- 1. Not at all
- 2. Some
- 3. Medium
- 4. Much
- 5. Very much

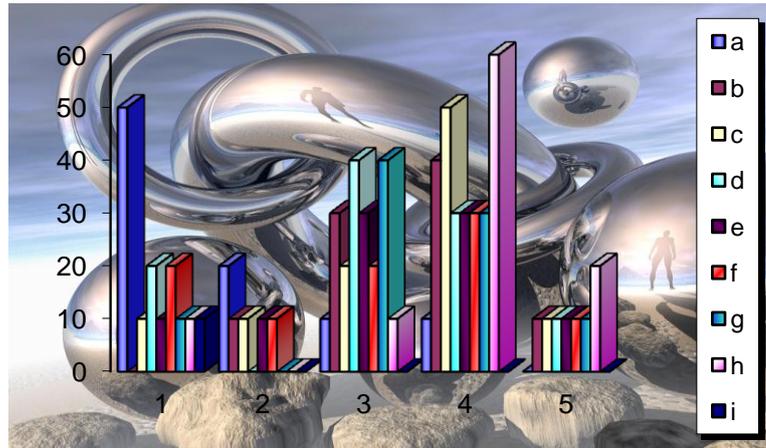


Fig.5. Interest range of topics

The Quality field and the manufacturing can be said to predominate, with greater importance, followed by the Design of products and Technologies, on third place. Companies consider that the Research is less important, followed by Operation and Recycling/reuse.

4. CONCLUSIONS

PLM is an integrated business strategy that covers all aspects of the lifecycle of product, from idea, design, manufacturing, use, maintenance, removal and recycling.

Beyond PLM software capabilities and promises it exists and serious gap between enterprises expectations and implementation results of different solutions. Different studies indicate that PLM implementation is still on its initial stage, mostly focusing on partial aspects and still based merely on PDM software.

Local enterprises (Oradea, Bihor county) are not understand very clearly what PLM means and are focused on different product lifecycle stages, especially in using CAD/CAM systems and manufacturing.

References:

1. CEEEX 243/2006, *Rețea națională de cercetare în domeniul ingineriei integrate a produselor și proceselor*, Raport final, 2008.
2. ***, www.datastay.com, 2012.
3. Ali Safadi, *Presentation - OAUG*, www.cpgsolutions.com/, 2008.
4. Gunther Schuh, Henrique Rozenfeld, Dirk Assmus, Eduardo Zancul, *Process oriented framework to support PLM implementation*, *Computers in Industry* 59 (2008) 210–218.
5. Thimm, S.G. Lee, Y.-S. Ma, *Towards unified modeling of product life-cycles*, *Computers in Industry*, 57 (2006), pp. 331–341.
6. ***, www.cimdata.com, 2012
7. ***, www.expertgs.com, 2012
8. ***, www.knowllence.com, 2012