PLM talks.

PLM. A definition.

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The purpose of this presentation is not to emphasize the benefits of Product Lifecycle Management, neither to list what risks it could avoid, and neither to enumerate the problems it could potentially solve. It is even not about qualifying PLM and analyzing if it is good or bad for a business.

No.

The scope of this talk is the definition of PLM. A definition of PLM.

Over the next 20 minutes or so, I will share my vision of PLM based on readings, discussions, reflections and most importantly, experiences.

I will have presented 2 things:

One – That PLM is a theory in business improvement, and by extension its practice.

And the second thing is the content of this theory based on 2 principles.

**No unique answer.**

So what is Product Lifecycle Management? Can I define it? Can I represent it? Can I see it? Can I do it? Can I buy it? Well, at least I can speak about it. And fortunately I am not the only one who talks about it. As a matter of facts the term is widely employed and sounds now like a buzz.

**BEGINNING FIGURE 1 –**

PLM is often juxtaposed with other words; for example, you might be familiar with the following terms.

PLM project, PLM consultant, PLM system, PLM user, PLM vendor, PLM analyst.

Also PLM 2.0, PLM research center, PLM maturity model, PLM processes, PLM magazine, PLM market.

Even PLM TV or PLM talks with this show that you are presently following.

This is just a sample of the variety.

But do all these usages refer to the same meaning?

To clarify this, let’s have a look at some definitions proposed by actors in PLM.

**END FIGURE 1 –**

**BEGINNING FIGURE 2 –**

Here is a selection of extract from definitions that can be observed on Internet.

According to the 2 first ones, PLM is a business strategy. The next ones define it as a vision or a philosophy, another one as an approach.

Others will say it is a business discipline or a business activity.

But some others will speak about a solution, a set of capabilities.

Let me observe that there is not a unique answer to the question “What is PLM?”. So far, there is no descriptive definition which would provide a meaning that is generally used and agreed.

**END FIGURE 2 –**

**A relevant question.**

If there is no unique answer, then does it make sense to ask the question “What is PLM?” and to aim for a common answer?

I would answer “Yes” and I have 3 arguments:

First. To wonder is a natural behavior and most of the time a source of self-improvement.

Second. The diversity of point of view is fruitful, but to converge brings value through maturity and consensus. It is a required factor for further questioning towards the future.

And third. To define and understand something is the first step to master it. A definition gives values by bringing advices or recommendations.

So let’s try to answer this relevant question.

**A literal definition which makes sense.**

We will begin with the 3 terms from Product Lifecycle Management. By starting from the separated words, we will obtain a literal definition.

Management - is the practice of managing. In other words the business activity of handling and controlling.

Lifecycle - is the course of stages. The sequence of states during lifetime. But also the full span of life.

Product - is a little bit more complex to define. We already have to go away from the strictly literal sense. Indeed here we don’t speak about the individual physical product, or service, or process, that is a unitary result manufactured or delivered by a company. It is not the real individual product built from the raw material to the hands of a customer. We shall interpret “product” as the virtual product from a company.

This willing to virtualize the physical product is important in the scope of PLM.

The virtual product is the representation which characterizes, defines and relates to the real physical product. A kind of avatar of one or multiple products in a virtual world. By the way, this virtualization process is described with clarity by *Michael Grieves* with the Information Mirroring Model.

**BEGINNING FIGURE 3 –**

Information Mirroring Model is showing the relationship in-between the real (or physical) space and the virtual (or digital) space. The virtual product is the single representation that corresponds to the physical product in the real world.

**END FIGURE 3 –**

Back to our main topic, let’s repeat our definitions of the 3 separated words.

Management: the business activity of managing.

Lifecycle: the course of stages or lifespan.

Product: the virtual product of a company.

If we try to combine these definitions, we should come to a literal definition of PLM.

The most common recombination that is observed is:

PLM is the business activity of managing company’s virtual product all the way across its life. The order is Product Management / (during) Lifecycle: P,M,L.

This first literal definition gives a pretty clear meaning. Actually it is very near from the beginning of *John Stark*’s definition. I quote “PLM is the business activity of managing a company’s products all the way across their lifecycles”.

For my part, I will keep the order Product Lifecycle / Management, and consider this second literal recombination of the definitions:

PLM is, the practice of managing, the course of stages, of the virtual product.

So the stress is on the lifecycle, not on the product. The focus is on the dynamic, the transition, the transformation; not on the static information of the product.

This second literal definition makes sense. PLM is not about product data management, but about the flow of information across phases, functions, persons, processes, systems.

**PLM is a theory.**

So we have a literal definition: “PLM is, the practice of managing, the course of stages, of the virtual product.”

We shall now interpret this rough combination.

Well, to separate the words gives a taste of absolute to them.

“lifecycle” gives the picture from the cradle to the grave. It let us think that it must be for a total period of time, without time limit, neither interruption.

The same feeling with “virtual product”. It gives the picture of a full representation of the physical product in a digital world. It is not anymore product data, but an ideal situation when the exhaustive information of a product is captured.

So my point is that the literal definition depicts more an ideal situation, a theoretical model.

Such absolute can never be reached of course; we can only aim this perfection. This is precisely this intention to follow principles that is important here. A company should try to match his practice with the theory.

And this reasoning led me to propose this definition of PLM.

**BEGINNING FIGURE 4 –**

Product Lifecycle Management is a theory, in business improvement, that considers that to improve the share and the transfer around company’s virtual products will bring value.

**END FIGURE 4 –**

This definition put the stress on the following 5 points in which I identify the 2 last ones as the 2 principles of PLM:

1-it is a theory: a logical structure that enables one to deduce the possible results of a behavior. It is a model that is an opinion, a belief and not necessarily consistent with the true descriptions of reality. This theory is “An idea accounting for or justifying something”, as defined by *Compact Oxford English Dictionary*.

2-It is a theory in business improvement: the science which aims to improve the growth and profitability of company through an operational transformation. Business improvement has a large scope and could consist for example of IT project, or reorganization, or process reengineering, etc. Business improvement does not mean business management. The point is that PLM theory aims to improve a business, not to describe exhaustively how to run a business. Business improvement indicates that PLM is not restricted to product development. The intention of PLM is to have an holistic vision of how to improve growth and profitability, and not be limited to R&D for example.

3-It is one theory among others in business improvement. It can coexist with other theories; it is not an exhaustive vision that solves all issues. Other theory in business improvement – *Lean* for example - shall be considered and could consolidate the PLM theory.

The last points, number 4 and 5, are the 2 principles of PLM.

4-PLM presents the virtualization of the product as a positive factor for a business. Therefore we observe a focus on technologies to support this digitalization.

5-PLM presents the share and transfer around the product as a positive factor. It can consist of integrating data through technology, joining up processes, or collaboration like cross functional alignment, and even supplier and customer integration.

So we have seen 5 points:

A theory, in business improvement, one among others, with 2 principles: virtualization with share and transfer around the virtual product.

**PLM is also a practice.**

The definition I proposed qualifies PLM as a theory. But the literal definition I started from, qualified PLM as a practice. It was: “PLM is the practice of managing, the course of stages, of the virtual product.”

Well, like most of the theories, you can practice it. And generally the related practices following the principles are called the same as the theory.

So Product Lifecycle Management term can be used both with the meaning of the theory, and with the meaning of its practice. By practice I mean a behavior, an action, an activity, that follow voluntary or not the theory.

When a person or a group, or an organization act in accordance to the principles of PLM, we can say they do PLM.

Let me give you some examples.

When a CAD designer uploads his 3D model on a file system server to share his work with colleagues; he does PLM.

When a R&D department reengineers his New Product Development Process in order to synchronize procurement activities in it; he does PLM.

When the infrastructure service sets up a replication server of the PDM system and permit quicker access to product information in other countries; he does PLM.

When a company buys a PDM application and sets up an integration with MRPII system in order to streamline communication between engineering and manufacturing; it does PLM.

My last example will be; When a quality department issues data standards to unify the part attributes and configuration rules through the company; it does PLM.

We can observer, that when it comes to its practice, PLM has multiple forms.

**PLM is even a market segment.**

As stated previously, the first core principle of PLM is high virtualization of the physical product. The second one being the focus to share and transfer around the virtual product.

This objective of high virtualization requires the use of digital technology. Many software are therefore released to support this goal: Computer Aided Design (or CAD) software, Electronic Design Automation (or EDA), Computer Aided Engineering (or CAE), Product Data Management (or PDM), Computer Aided Manufacturing (or CAM), integration middleware, etc.

The growth of the software sales, the increase of vendors number and the interest of IT/IS companies made it necessary to name this market in order to refer to and analyze it. PLM found here a new meaning as a market of software and related services to support the practice of PLM.

We can remark that vendors have a very good argument saying “you should buy everything from a single source to minimize the headaches and maximize the benefit”. Because the more divers the software suite, the more it will cost to integrate, as well as the continual problem of maintaining. They emphasize here the duality of PLM that resides both in virtualization and in share and transfer”.

**A definition corresponding to usage.**

I see PLM first as a theory, then as the practice of this theory, and finally as a market with suppliers and customers who give credits to this theory, who believes in it.

Let’s confront these 3 correlated definitions, or I would prefer meanings of Product Lifecycle Management to the reality and the observed usages.

**BEGINNING FIGURE 5 –**

If we come back to the different usages observed of the term PLM. We can retrieve the 3 different meanings of it.

As a theory, in PLM project, PLM consultant, PLM 2.0, PLM research center and PLM talks.

As a practice, in PLM system, PLM user, PLM maturity model and PLM processes.

And as a market, in PLM vendor, PLM analyst, PLM magazine, PLM market and PLM TV.

**END FIGURE 5 –**

**BEGINNING FIGURE 6 –**

If we look back at the different definitions found of the term PLM. We can again retrieve the 3 different meanings of it.

As a theory, with the synonyms strategy, vision, philosophy, approach. Even if approach is already the idea to practice a theory.

Then as a practice, with the words discipline, activity.

And as a market, with more technology oriented words: solution, means and capabilities.

**END FIGURE 6 –**

**PLM coexists with other theories.**

To perfect a definition, most of the dictionary gives synonyms, contraries, comparable concepts, or examples, illustrations. Let’s give a short list of comparable concepts.

PLM is a theory in the science of business improvement. There are numerous other theories in this domain. For example:

-Lean Thinking,

-Toyota Product Development System (TPDS),

-Six Sigma,

-Business Process Improvement (BPI),

-Kaizen,

-Theory of Constraints (TOC),

-Enterprise Resource Planning (ERP).

I see all these theories as comparable to PLM in the sense it aims to improve a business but with different principles and focus.

**Value of this definition.**

I believe the value of this definition resides in some advices or rules about PLM that could be deduced from it.

Here are the main ones I observe.

Some of the theories we just have listed are particularly popular in publications on business management, manufacturing or IT. Some like PLM could be seen as a buzz. Like other theories, PLM is not the answer to everything. It coexists and could be combined with other theories. It is important not to overestimate one theory and displace the others. It is important not to try to apply a theory to problems it was never meant to solve.

Another recommendation about these theories is not to apply them with excess. You will not success applying the full capabilities of PLM to an immature company. The transformation of PLM practices shall be adapted to the maturity level of an organization.

In correlation to the previous remark, we can note that there is no finishing line in the practice: PLM is an everlasting journey.

A characteristic of PLM is that, because it is based on reengineering and automation, it produces more radical changes in a performance of an organization, rather than a series of incremental changes or continuous improvement. Lean thinking could be given as an example of more linear improvement.

And finally, as mention before the duality virtualization/share and transfer leads to conclude that when improving digitalization, one should not forget to make sure this information is disseminated, integrated.

**Critics of this definition.**

To help the audience and question my position, I would like to propose 2 main critics to this definition and suggest some follow up actions.

First critic is that the definition was presented as a result of a literal, theoretical and I will say academic approach. Therefore it needs to be consolidated with more feedback from more diverse sources.

Secondly, I see this definition as based on the “Information Mirroring Model” from *Michael Grieves*, and therefore some back loop could be valuable to validate this approach.

Finally, and to go further with this work. This talk gave a brief overview of a definition of PLM and introduced some concepts without detailing them. To give more explanations about them may be necessary and some related questions could be: What is virtualization of a product? What are the states of the digital product? What is share and transfer around the product? Also the comparison with other theories would be fruitful to understand the specificities and differences that will fully characterize PLM.

**To understand is the first step to master.**

So that’s a brief overview of my definition of Product Lifecycle Management.

I showed you that it is a theory in business improvement, that it is based on the 2 principles: more virtualization, better share and transfer around product, and that by extension PLM is also the practice of the theory, as well as the related market.

But nothing compares to having your own definition of PLM. Defining it and understanding it is the first step to master your PLM. So read, talk, experience PLM and make your personal definition.

Thank you.