

Chapter 2

My Experience with PLM

Product Lifecycle Management (PLM) is the business activity of managing, in the most effective way, a company's products all the way across their lifecycles; from the very first idea for a product all the way through until it is retired and disposed of.

PLM is the management system for the company's products.

At the highest level, the objective of PLM is to increase product revenues, reduce product-related costs, maximise the value of the product portfolio, and maximise the value of current and future products for both customers and shareholders.

2.1 PLM Experience with More than 100 Companies

Maybe you're wondering if this book is based on practical experience. Well, I've worked with more than 100 companies on PLM activities. PLM applies around the world. I've worked with companies in Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Malaysia, Netherlands, Portugal, South Korea, Spain, Sweden, Switzerland, Thailand, Tunisia, the United Kingdom and the United States of America.

As well as being applicable throughout the world, PLM applies to a very wide range of products. The companies I've worked with have been in a wide range of industry sectors, with products such as aeroplanes, automotive parts, beverages, cameras, cars, circuit breakers, computers, drive belts, electrical connectors, elevators, fasteners, food, hand tools, helicopters, machine tools, machinery, medicines, oil platforms, pharmaceutical products, rockets, ships, shoes, tools for surgeons, turbine blades, weighing equipment and windscreens.

I'll give you some examples of the type of company that I've worked with on PLM. They show the different sizes of companies working on PLM. They show the objectives of typical PLM Initiatives, and the level of executives involved. They also show some examples of the activities in a PLM Initiative.

I worked with a global FMCG company with 25,000 employees. The PLM Initiative was sponsored by the CEO. I supported the PLM Initiative Leader over 18 months. I was responsible for improving business processes, such as New Product Development (NPD), leading to a 10% reduction in time to market. Among my activities were Business Process Mapping of the as-is situation. And blueprinting of the future, to-be processes.

For a global leader in the beverage industry, I worked with the PLM Initiative Team to develop a PLM Vision and PLM Strategy to meet revenue growth objectives in the long-term corporate business plan. The objective was to double revenues. The Initiative Leader reported to the CEO.

I worked with the CEO, VP R&D and VP Production of a \$500 M global leader in the industrial belting industry with over 5000 employees. I provided support in many different areas including PLM Initiative Initiation, Planning and Management. The objective was to improve business processes across the product lifecycle and support them with a Product Data Management (PDM) system. Results included: more truly innovative products developed; more products brought to market annually; reduced product development time; and fewer product development projects failing.

I worked on the PLM Initiative of a global leader in the medical device sector for about 4 years. The objective was to reduce time to market by 15%. The company had about 10,000 employees. The Initiative Sponsor was the CEO. I helped develop PLM Vision, Strategy and plans; develop and implement improved product-related business processes; model product data, select and implement a common PDM system worldwide.

I worked for 3 years with the COO of a global leader in the transportation sector with over 50,000 employees. One objective was to reduce time to market. Another was to eliminate from the portfolio and inventory the many old products that were no longer ordered. I defined and implemented cross-functional Product Idea Management, New Product Development (NPD), Engineering Change Management (ECM), and Phase-out processes. I developed a training program for over 300 product developers.

For a \$400 M machine tool manufacturer with 2000 employees working on several sites in Asia, Europe and North America. I supported the PLM Initiative Team over 18 months. I was involved in PLM Team education; development of PLM Vision and plans. We improved product-related processes, cleaned up product data, and defined product data management requirements. We selected Computer Aided Design (CAD) and PDM systems. The final presentation was to the company's President.

For a rail infrastructure manufacturer I reviewed and improved product structures. As a result of several mergers and acquisitions, there were many duplicate structures and many very similar structures. During the Initiative, product structures were harmonised. As a result of the Initiative, the time spent on managing product structures was reduced from weeks to hours, and complexity reduced by over 80%. That led to significant cost reductions.

For a \$5B pharmaceutical company, I reviewed discovery and development processes and applications, leading to identification of errors in interfaces causing loss of potential products. These products had potential sales of over \$1B.

For a \$1B industrial equipment manufacturer, the PLM Initiative was part of post-merger integration. It focused on harmonisation of business processes and applications. Product data from different sites had to be cleaned up, harmonised and loaded into a common PDM system. Interfaces had to be built to the company's ERP system. As well as NPD, ECM and Product Portfolio Management (PPM) processes, it included definition of Risk Management and Intellectual Property Management (IPM) processes.

For an \$800 M industrial products company aiming to reduce time to market, the Initiative started with a review of the NPD process. It was soon apparent the company could reduce the time to market for some new products from 3 years to 3 months. As a result, the CEO got very interested in the Initiative.

The smallest company I worked with had a few hundred people. The largest had hundreds of thousands. Revenues range from \$50 M to \$50B.

The above high-level descriptions show that different companies have different objectives and different PLM Initiatives.

The Appendices give more detailed descriptions of some Initiatives in other companies. Appendix A gives a more detailed description of the starting environment of one company. Appendix B describes some of the issues that other companies faced.

2.2 PLM Is for Executives

The company President, CEO or COO had a role in about three-quarters of the examples in the previous section. When they didn't, VPs and Directors were involved. This shouldn't be a surprise. PLM is executive business. It addresses 25 and 50% of a company.

And the business objectives of the Initiatives outlined above are of interest to executives. Business objectives such as: reducing time to market; reducing costs; increasing the number of new products per year; increasing revenues; reducing complexity.

2.3 More than 100 Companies, but Similarity of Subjects

Some of the examples in the previous section were of PLM Initiatives that addressed all the phases of the product lifecycle: ideation, definition, realisation, service/maintenance and recycling/disposal. But, in other companies, the PLM Initiative just addressed a few of these, or maybe just one.

You may have noticed that, even though these companies are of different sizes and have different products, some subjects keep coming back in their Initiatives. For example, business processes are frequently addressed. Business processes such as: Idea Management, New Product Development, and Engineering Change Management. Another frequent subject is product data—modelling it, cleaning it, migrating it. Then there’s evaluation, selection, configuration and deployment of Product Data Management (PDM) systems. And another frequent subject is other PLM applications such as Computer Aided Design (CAD) and Enterprise Resource Planning (ERP). Equipment also features. Not just manufacturing equipment in the factory, but also sales cabinets and recycling equipment. Then there are techniques such as Design for Assembly (DFA) and benchmarking. And activities addressing people, such as education and training. And, of course, management and organisational approaches to the company’s resources and activities, including Project Management and Organisational Change Management.

When such subjects are positioned on the PLM Grid (Fig. 2.1), the complexity of the PLM environment becomes apparent.

The PLM Grid is a simple 5 * 10 grid or matrix. On the horizontal axis of the grid are the five phases of the product lifecycle: ideation, definition, realisation, support, recycle.

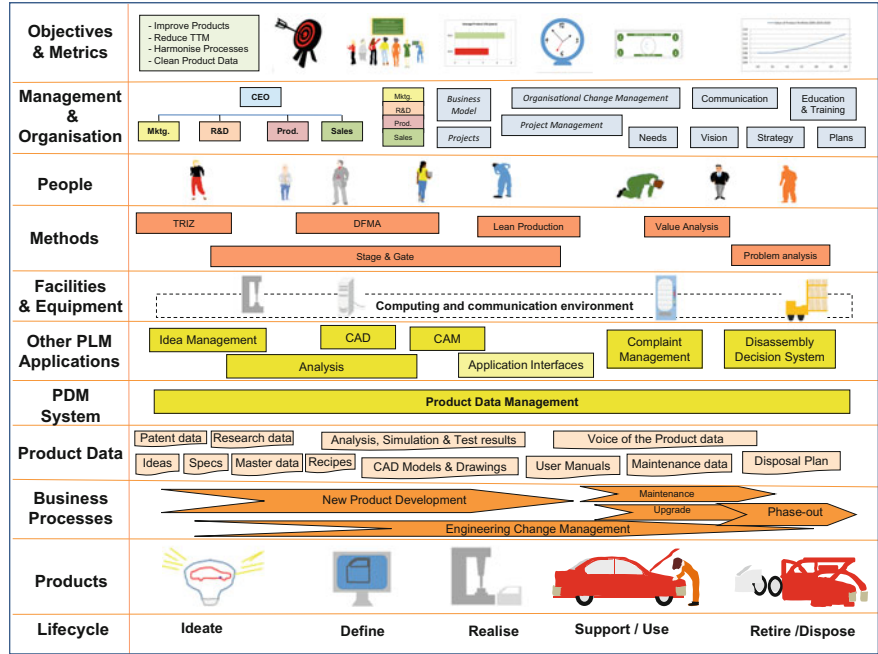


Fig. 2.1 The PLM Grid

On the vertical axis are the components that have to be addressed when managing a product across the lifecycle. There are ten of these (i.e., processes, applications, product data, etc.)

The PLM Grid shows the scope of PLM. It helps show why the environment of the product can be so difficult to manage. The scope of the environment is broad. Many subjects are addressed, ranging from methods for identifying ideas for new products, through organisational structure, to end-of-life recycling equipment. The scope is wide, but that reflects the reality of managing products.

2.4 Experience of Others: The World Changed

PLM emerged in 2001. Before then, it didn't exist.

So why did PLM emerge in the early years of the 21st Century? The underlying driver was the massive change in the environment in which companies managed, developed and supported products.

From the beginning of the 1980s, much was written about these changes. For example, in 1982, W.E. Deming published "Out of the Crisis". In 1983, Theodore Levitt wrote an article called 'Globalization of Markets'. In 1986, Robert Cooper published "Winning at New Products". In 1987, the Brundtland Commission reported on Sustainable Development. In 1993, Michael Hammer published "Reengineering the Corporation".

The changes that occurred were of different types and came from different sources.

Macroeconomic changes affected companies developing, producing and supporting products. Such changes included: the end of the Cold War in 1991; globalisation; geopolitical developments; changing roles of China and India in the world economy; deregulation and increased competition.

Other changes affecting product companies had environmental sources, such as recycling directives, Global Warming, pollution, regulatory requirements; sustainable development and the Circular Economy.

Another type of change facing product companies was linked to changes in the overall corporate environment. These included: management theories such as Lean; outsourcing; offshoring; multi-site activities; multi-cultural, multi-lingual environments; changing business models; the publication of ISO 9000 in 1987.

Another type of change was related to the emergence and availability of new technologies: Information Systems; databases; mobile communications; social networks; the World Wide Web and Internet (the world's first website and server went live at CERN in 1990); digitalisation; the Internet of Things; cloud computing; connected products; Big Data and Analytics.

And some of the changes were very closely related to the product itself: some products had increasingly long lives; some products had increasingly short lives; customisation; fast changing products; increasing product/solution/service complexity; global products; increasing importance of electronics and software in products.

2.5 Issues in the Changed Environment

The changes outlined in the previous section made life difficult for companies that develop, produce and support products. In such an environment, they needed to have great products that left competitors far behind. They needed a great product deployment and support capability. They needed to be continually in control of their products. If they weren't, and for one reason or another, they took their eye off the ball, unpleasant consequences could occur (Fig. 2.2).

2.6 Experience of 100 Companies and 500 Executives

From my experience with more than 100 companies, I've found that a key factor in the success of a company's PLM Initiative is its executives. They can make or break a PLM Initiative. A lot depends on the behaviour and involvement of the executives who sponsor, lead and otherwise contribute to the Initiative. But, from my experience, just as companies have very different PLM Initiatives, they also have very different executives. And just as companies have very different objectives, their executives also have very different objectives. Some executives are devoted to their company, and will do everything possible to make a PLM Initiative succeed. Others seem to put their personal objectives first. For example, they may see a PLM Initiative as a way to create problems for fellow executives who are potential rivals for the position of CEO.

Some executives will want to get really involved in a PLM Initiative. Others won't.

Some executives will claim they know what they're doing, and don't need to know more about PLM. Some executives will want to know more, so they can get more involved and perform better. Some will want to know more, so that they don't have to get more involved, but can delegate better.

<i>Imagine</i>	<i>Define</i>	<i>Realise</i>	<i>Support/Use</i>	<i>Retire/Recycle</i>
Ideas pirated	Projects late/ failing	Pollution costs	Upgrades ignored	Incorrect identification
Lack of ideas	Costs too high	Poor factory layout	Missing applications	Poor documentation
Ideas lost	Uncontrolled changes	Scrap	Poor communication	Low recycle rate
Suppression of ideas	Unclear processes	Rework	Data out of control	Materials wasted
Missing applications	Needs not clear	Costly prototypes	Little feedback	High disposal costs
Culture of sterility	Design faults	Supplier problems	Customers lost	Fines
Failure punished	Application Islands	High material costs	Liability costs	No training
Bureaucracy	Long time to market	Excess inventory	Missing services	Lack of control
Priority, #1 CYA	Data silos	Limited part re-use	High service costs	Missing applications
Unknown cost	Culture of risk	Slow ramp-up	Processes unclear	Processes undefined
No training	Project status vague	Safety problems	Product recalls	Lack of procedures
No process defined	Too many projects	Wrong data versions	Product failures	Costly disassembly

Fig. 2.2 Problems across the product lifecycle

And then, some executives will work better in the steady state, when things aren't changing. While others will prefer leading in a changing environment. Some will be good at leading short-term initiatives over a few months. Some will be better at leading long-term initiatives over several years.

But whatever their character, I've never met an executive who couldn't benefit from learning more about PLM.

<http://www.springer.com/978-3-319-72235-1>

Product Lifecycle Management (Volume 3): The
Executive Summary

Stark, J.

2018, VIII, 137 p. 72 illus., 17 illus. in color., Hardcover

ISBN: 978-3-319-72235-1