

Introduction to Product Lifecycle Management (PLM) Module 1

Cynthia L. Tomovic, Ph.D.

Purdue University

Discovery Park Center for Advanced Manufacturing

The Product Lifecycle Management Center of Excellence



Teaching Notes in Notes Page View



PLM: Definition

“Product Lifecycle Management (PLM) is an integrated, information-driven approach comprised on people, processes/practices, and technology to all aspects of a product’s life, from its design through manufacture, deployment and maintenance – culminating in the product’s removal from service and final disposal. By trading product information for wasted time, energy, and material across the entire organization and into the supply chain, PLM drives the next generation of lean thinking.”

Michael Grieves, *Product Lifecycle Management: Driving the Next Generation of Lean Thinking* (New York: McGraw-Hill, 2006), 39.



The Product Lifecycle Management
Center of Excellence

Center for Advanced Manufacturing

Product Lifecycle Management

- Newest wave in productivity
- Expands lean thinking

Michael Grieves, *Product Lifecycle Management: Driving the Next Generation of Lean Thinking* (New York: McGraw-Hill, 2006), 1-5.

Product Lifecycle Management (PLM) is the newest wave of lean thinking leading to increased productivity.

PLM takes lean to the next level by eliminating wastes across all aspects of a product's life, not just in manufacturing.

PLM was first piloted in the automotive and aerospace industries, both sectors having complex manufacturing products and systems. Later spread to electronics industry, consumer packaged goods, industrial goods, medical devices, pharmaceuticals.

PURDUE UNIVERSITY The Product Lifecycle Management Center of Excellence Discovery Park Center for Advanced Manufacturing

PLM Foundation

- Information
 - Digitizing
 - Sharing
 - Moving bits instead of atoms

Michael Grieves, *Product Lifecycle Management: Driving the Next Generation of Lean Thinking* (New York: McGraw-Hill, 2006), 6-12.

PLM foundation is the application of information technology.

Employs product information, computers, software, and simulations to drive out inefficiencies.

Assumes critical product and process information can be captured through digitization and shared among different constituents involved in the product or process lifecycle..

PURDUE UNIVERSITY The Product Lifecycle Management Center of Excellence Discovery Park Center for Advanced Manufacturing

PLM Components

- Components
 - People
 - Processes/practices
 - Technology

Michael Grieves, *Product Lifecycle Management: Driving the Next Generation of Lean Thinking* (New York: McGraw-Hill, 2006), 129-157.

PLM components are people, processes/practices, and technology.

Information can be shared and coordinated among the components to realize product and process efficiencies.

PURDUE
UNIVERSITY

The Product Lifecycle Management
Center of Excellence

Discovery Park
Center for Advanced Manufacturing

PLM Integration

- Internal organization integration
- External organizational integration
 - Partners
 - Suppliers

Michael Grieves, *Product Lifecycle Management: Driving the Next Generation of Lean Thinking* (New York: McGraw-Hill, 2006), 40-93.

Focuses on all functional areas through out the entire product lifecycle--- design, manufacture, support, and disposal of the product.

PLM Lifecycle Model



Michael Grieves, *Product Lifecycle Management: Driving the Next Generation of Lean Thinking* (New York: McGraw-Hill, 2006), 40-45.

Mileta Tomovic, PLM Curriculum, Society of Manufacturing Engineers Grant Presentation, Purdue, May, 2006.

PURDUE
UNIVERSITY

The Product Lifecycle Management
Center of Excellence

Discovery Park
Center for Advanced Manufacturing

PLM Benefits: IT Value

- Efficiencies
 - Time
 - Energy
 - Materials
- Innovation
 - Product
 - Processes
- Revenue

Michael Grieves, *Product Lifecycle Management: Driving the Next Generation of Lean Thinking* (New York: McGraw-Hill, 2006), 121-125.

Efficiencies gained in use and costs associated with time, energy, and materials.

By driving out inefficiencies, resources can be reallocated and result in product and process innovation.

Resulting innovations can lead to increases in revenue.

PURDUE UNIVERSITY The Product Lifecycle Management Center of Excellence Discovery Park Center for Advanced Manufacturing

PLM Application of Systems Thinking

- Systems Thinking
 - Understanding the whole by understanding the linkages between the component parts

Wikipedia: The Free Encyclopedia, http://en.wikipedia.org/wiki/Systems_thinking

PLM is an application of systems thinking. **Systems thinking** is an approach to analysis that is based on the belief that the component parts of a system will act differently when isolated from its environment or other parts of the system, and argues against Descartes's reductionist view. It includes viewing systems in a holistic manner, rather than through purely reductionist techniques. Systems thinking is about gaining insights into the whole by understanding the linkages and interactions between the elements that comprise the whole "system", consistent with systems philosophy. Systems Thinking recognizes that all human activity systems are open systems; therefore, they are affected by the environment in which they exist. Systems Thinking recognizes that in complex systems events are separated by distance and time; therefore, small catalytic events can cause large changes in the system. Systems thinking acknowledges that a change in one area of a system can adversely affect another area of the system; thus, it promotes organizational communication at all levels in order to avoid the silo effect.

Systems thinkers consider that:

Systems thinkers consider that:

a "system" is a dynamic and complex whole, interacting as a structured functional unit
information flows between the different elements that compose the system

a system is a community situated within an environment

information flows from and to the surrounding environment via semi-permeable membranes or boundaries

systems are often composed of entities seeking equilibrium, but can exhibit oscillating, chaotic, or exponential growth/decay behavior (Wikipedia).

Wikipedia: The Free Encyclopedia, http://en.wikipedia.org/wiki/Systems_thinking

References

- Michael Grieves, *Product Lifecycle Management: Driving the Next Generation of Lean Thinking*, New York: McGraw-Hill, 2006.
- Mileta Tomovic, *PLM Curriculum*, Society of Manufacturing Engineers Grant Presentation, Purdue University, May, 2006.
- WikipediA: The Free Encyclopedia, http://en.wikipedia.org/wiki/Systems_thinking

Acknowledgements

The author wishes to acknowledge the support from the Society for Manufacturing Engineers - Education Foundation, SME-EF Grant #5004 for "Curriculum Modules in Product Lifecycle Management."