DIGITAL ENTREPRENEURS'
Guide to English: Communicating in the Online Marketplace

Editors:

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Kripa Drishti Publications, Pune.

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GUIDE TO ENGLISH: COMMUNICATING IN THE ONLINE MARKETPLACE

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14. Streamlining Business Operations Through a Time Study Driven Approach to Product Lifecycle Management Process Optimization

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Abstract:

In an increasingly competitive and efficiency-driven business landscape, organizations are compelled to optimize their operations across all stages of the product lifecycle. This study explores a time study-driven approach to enhancing the ***Product Lifecycle Management (PLM)*** *process, focusing on the identification and elimination of inefficiencies in workflows, resource allocation, and decision-making timelines. By applying structured time study techniques such as task segmentation, time-motion analysis, and cycle time benchmarking this research aims to streamline PLM stages from concept development to end-of-life product management. The study utilizes a case-based methodology within a mid-sized manufacturing organization, where current PLM processes were mapped, timed, and analyzed. Key bottlenecks and redundancies were identified, leading to data-backed recommendations for process reengineering. Results demonstrate significant improvements in cross-functional coordination, lead time reduction, and decision-making efficiency. The findings suggest that time study methods, when integrated with digital PLM tools, offer a robust framework for continuous improvement and operational agility. This research contributes to the evolving field of operations management by positioning time study as a strategic enabler for smarter, leaner, and more responsive product lifecycle management.*

Keywords:

Time Study, Product lifecycle, Streamline, Time-Motion Analysis and Decision Making

14.1 Introduction:

In the digital era, PLM, MES; ERP are the golden triangle for an Industry. Once it synchronizes and process flow streamlined, then the industry can focus on innovation and future improvements. PLM is the connecting point from requirements to Production.

MES will take care of production end to end. SAP will focus on resource management. Our focus of PLM begins with customer requirements goes into planning, design, development, proto modelling, conceptualization, production, service and End of life. So, all these process durations are varying each manufacturer one another. This has significant impact on Market demand and supply. When a product does not hit the market on time, it affects both manufacturer and consumer to lose their financial stabilization as well as long term plan. This PLM steps varies as per Job, Batch and Mass production. According to Technology development and new product development process, the input and output might differ in each step. Again, even Automotive industry is one of the giant worlds. It has many divisions, Fuel, Electric, hybrid vehicles. Also, it can be Car, truck, sport vehicles, public vehicles and so many varieties. In my study, I am planning to focus on car manufacturers across the globe in all fuel, electric and hybrid type models. The individual lifecycle steps duration and overall duration to be analysed for same product type and compare international practice. We need to give a optimize lifecycle process to suggest the industries to adopt the best practices.

14.2 Review of literature

According to **Stark (2015)**, PLM integrates people, processes, business systems, and information to support a product's lifecycle effectively. In modern organizations, PLM is crucial for improving innovation, reducing time-to-market, and enhancing collaboration across departments.

Grieves (2006) points out, PLM systems often become inefficient due to poorly defined workflows, lack of process visibility, and limited real-time performance monitoring. These inefficiencies can lead to longer development cycles, increased costs, and missed market opportunities.

Time study, as defined by **Barnes (1980)**, is a methodical process of recording and analyzing the time taken to complete specific tasks. It is traditionally used in manufacturing and operations to determine standard times and identify opportunities for improvement. **Niebel & Freivalds (2003)** emphasize that time studies are essential for setting benchmarks, managing labor costs, and improving workflow efficiency.

Modern time studies often use tools like stopwatch timing, time-tracking software, and video analysis. These methods are especially useful in identifying non-value-adding activities and reducing process variability.

Time study has expanded beyond the factory floor into administrative, service, and product development environments. **Rother and Shook (2003)** highlight the relevance of time studies in Value Stream Mapping (VSM), a core lean methodology for visualizing and improving end-to-end processes.

Harrington (1991) asserts that integrating time study into business process reengineering (BPR) efforts can uncover hidden inefficiencies, particularly in cross-functional processes like PLM. Time-driven data enables objective decision-making and supports data-backed redesign of workflows.

Although PLM tools (like Siemens Teamcenter or PTC Windchill) provide visibility into product data, they often lack built-in time-based diagnostics. As **Terzi et al. (2010)** argue, many organizations fail to integrate operational performance metrics (such as task time, lead time, or approval delays) into their PLM processes. This disconnect limits the ability to detect workflow bottlenecks and optimize cycle times.

Hossain & Arefin (2018) note that most PLM optimization efforts rely heavily on technology upgrades without equally focusing on process-level improvements and time efficiency analysis. This creates a research gap in combining time study methodologies with PLM optimization frameworks.

14.3 Industry Business Model:

Industries choose their business model and form a method to run the entire Business process. In general, we can divide the whole business into Service and Development. Service industries are focusing on Projects which must be delivered- Development Industries are focusing on Product to meet the customer requirements. Both are focusing on output to customer, but inputs are different- Development Industries has to sell their products and collect purchase order. Whereas Service industries are trying to get orders and then execute it once obtained.

A business Model would be:

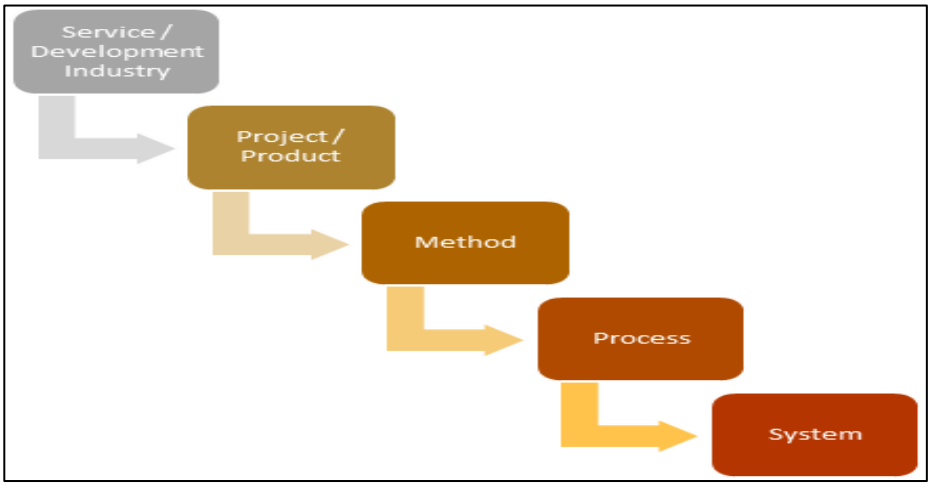

Figure 14.1: Industry Business Model

- Project for service industry is like association or Support to Development Industries
- Product is like most of the time making a new one or enhance the existing to meet customer needs.
- Method is to choose he way of executing the Project or Product needs. Product Industry method would be forming a pattern of following CRM-PLM-ERP-MES and other values like Financial, social involvement.

- Process is the baseline for execution. Industries are choosing the process based on the Product and customer needs. Globally processes are defined as ETO, CTO, MTO and so on.
- System is the one using to maintain the process, data and artifacts. Applications and tools are collectively confined as execution systems

Table 14.1: Industry Business Model

Industrial Process	Business Model	Production Type	Focus	Examples
Engineering to Order (ETO)	B2B	Job Production	Order	Ship building, Aviation, Transformers
Configure to Order (CTO)	B2C	Bach Production	Sales	Car, Laptop
Make to Order (MTO)	B2B and B2C	Mass Production	Sales / Order	Mobile phone, Refrigerator, Washing machine
Make to Stock (MTS)	B2B	Mass Production	Order	Spare Parts, fittings
Assemble to Order (ATO)	B2B and B2C	Batch / Mass Production	Sales / Order	Semiconductor Chips
Select to Order (STO9	B2B	Mass Production	Order	Catalog Parts, Ex. Flange, Coupling
Pick to Order (PTO)	B2B	Mass Production	N\A	Standard parts, Ex bolts, nuts

14.4 Product Lifecycle Management:

Product –

An industry output, it can be car, mobile, medicine, IC chip, transformer, flight, etc.

Lifecycle –

A product development process of Origin to End. Starts with customer and market requirements, then it goes to design, production. Finally, a company decides to end the product either the model manufacturing or whole unit decommissioning. This varies according to Job, batch and Mass production. Originally a product reborn in other form according to market trends and requirements. That's the reason it called as lifecycle. Same as human birth to death.

Management –

Manage the whole lifecycle process in either application or any form of system to track, evaluate and maintain the flow.

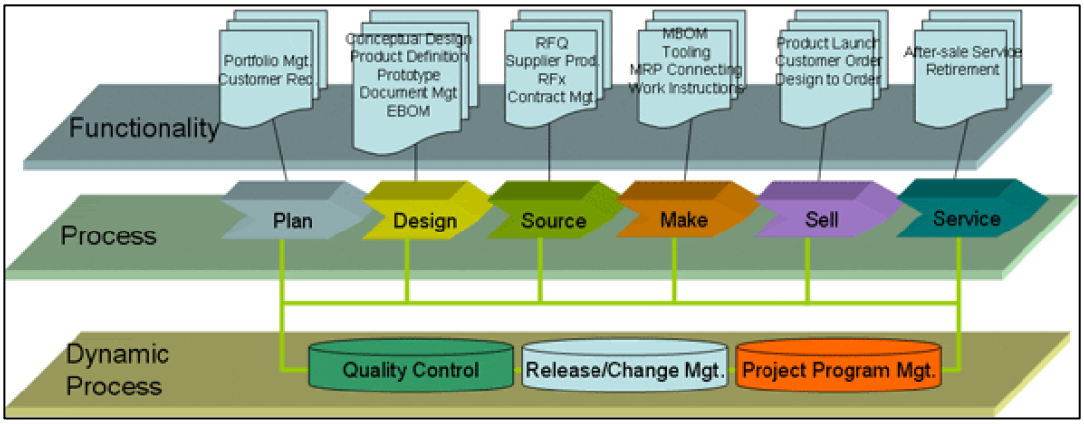

Figure 14.2: Product Lifecycle Management

A product development can be either new product development or New Technology development (Research and Development). So, both must plan all the below information's and decide the path to go through the entire lifecycle.

- Requirements Management
- Design Management
- Part Management (Standard Parts planning)
- Materials Management (Procurement)
- BOM Management (Design BOM. EBOM, MBOM and so on)
- Document Management (Artifacts / Drawings)

- Process Management (Release and Change)
- Test Management
- Logistics Management
- Installation and Commissioning Management
- Service Management
- Obsolete Management

14.5 Conclusion:

Different industry follows different types of PLM. Since PLM is flexible and no defined rule to make the industry adapt according to the various influencing factors. A few of the PLM types are Social PLM, Part centric, Design Centric, Product Centric Network Centric and so on. These different PLM makes the industry varies in Time to market.

For an illustration, one Mobile phone manufacturer takes one year to launch a new mobile whereas other mobile phone manufacturer takes only 3 months to launch a new mobile phone. So, there is a need to optimize the entire lifecycle time and redesign the process wherever industry struggles to mitigate the risks. Our study would help the industry to make a new approach and help them to reduce the time factor. This in turn will sure save cost and satisfy the Customer. Imagine a Medical industry has to urgently develop a new medicine to save a life, then a new lifecycle approach is highly recommended.

14.6 References:

1. Barnes, R. M. (1980). *Motion and time study: Design and measurement of work* (7th ed.). John Wiley & Sons.
2. Grieves, M. (2006). *Product lifecycle management: Driving the next generation of lean thinking*. McGraw-Hill.
3. Gunasekaran, A., Yusuf, Y. Y., Adeleye, E. O., & Papadopoulos, T. (2017). Agile manufacturing practices: The role of big data and business analytics with multiple case studies. *International Journal of Production Research, 56*(1–2), 385–397. https://doi.org/10.1080/00207543.2017.1395488
4. Harrington, H. J. (1991). *Business process improvement: The breakthrough strategy for total quality, productivity, and competitiveness*. McGraw-Hill.
5. Hossain, M. U., & Arefin, M. S. (2018). Investigating barriers to implement product lifecycle management (PLM) in manufacturing organizations. *International Journal of Innovation and Technology Management, 15*(6), 1850045. https://doi.org/10.1142/S0219877018500457
6. Niebel, B. W., & Freivalds, A. (2003). *Methods, standards, and work design* (11th ed.). McGraw-Hill.
7. Rother, M., & Shook, J. (2003). *Learning to see: Value stream mapping to create value and eliminate muda*. Lean Enterprise Institute.
8. Sharma, V., Ghosh, D., & Jha, R. (2020). Real-time PLM data tracking through IoT integration: An approach for process optimization. *Journal of Manufacturing Systems, 55*, 120–132. https://doi.org/10.1016/j.jmsy.2020.03.001
9. Stark, J. (2015). *Product lifecycle management: 21st-century paradigm for product realisation* (3rd ed.). Springer. https://doi.org/10.1007/978-3-319-17440-2

10. Terzi, S., Bouras, A., Dutta, D., Garetti, M., & Kiritsis, D. (2010). Product lifecycle management: From its history to its new role. *International Journal of Product Lifecycle Management, 4*(4), 360–389. https://doi.org/10.1504/IJPLM.2010.036489
11. Womack, J. P., & Jones, D. T. (2003). *Lean thinking: Banish waste and create wealth in your corporation* (2nd ed.). Free Press.
12. *Defining Product Lifecycle Management: A Journey across Features, Definitions, and Concepts* (http://dx.doi.org/10.1155/2013/170812)
13. https://www.plm.automation.siemens.com/de_de/Images/cs_ford_en_tcm73-117664.pdf
14. https://www.dline.info/jet/fulltext/v1n2/2.pdf
15. https://www.manufacturingmanagement.co.uk/content/news/caterpillar-awards-builds-on-global-product-lifecycle-management-software-1/
16. https://ivypanda.com/essays/a-case-analysis-of-caterpillar-inc/
17. https://www.cimdata.com/en/industry-summary-articles/item/5914-caterpillar-deploys-dassault-systemes-single-source-for-speed-industry-solution-experience