Advantages of PLM for Manufacturing Companies

Abstract

Manufacturing refers to the several segments that come under the detailed classification of the ISIC divisions, viz. automotive, food, chemical, paper, construction, electronics, etc. The contributors to the GDP can be divided as Agriculture, Industry and Services sector and manufacturing falls under the sector of Industry. It is said that approximately a third of the world's gross economic output is derived from the manufacturing sector alone. (Manufacturing, value added % of GDP, 2015). In the case of emerging economies and developing countries, the ratio is much more, as countries like India and China depend predominantly on the strength of their manufacturing for their economic benchmarking. In the year 2014, India, for example, ranked 12 for its Industry sector contribution to GDP, with USD495.62 billion. With a GVA of Rs.34.67 lakhs crores, the Industry sector contributed 30.02% to the GDP and the share of manufacturing in this was 17.18%. (Sector-wise contribution of GDP of India, 2015). Manufacturing, however, is one sector that has millions of processes and workflows and therefore the redundancies and room for error are also that much higher. Several manufacturers have embraced the concept of PLM to streamline their processes.

To understand how PLM impacts as well as benefits manufacturers across several segments, we first need to understand what PLM is and how it can be integrated into a part of our workflows and processes comprehensively.

1. International Standard Industrial Classification
2. Gross Domestic Product
3. Gross Value Added – A productivity metric which measures the difference between output and intermediaries consumption
4. Product Lifecycle Management
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Introduction - Challenges in the Manufacturing sector

From the point in time that a product is conceptualized till it goes to the market there are various stages involved in the lifecycle of the product and manufacturers need to be prepared for that spanner to be thrown in the wheel any time during the lifecycle. Very broadly speaking, a product goes through the following phases (Rudeck, 2012):

- Design
- Sourcing
- Manufacturing
- Distribution

By the time the manufacturer gets from start to end, there are various challenges that he will face:

- Process of creating the design / outsourcing the design
- Concept development
- New product introduction
- Global product development
- Manufacturing process planning/management
- Parts procurement/traceability
- Vendor management
- Inventory management
- Product engineering and reengineering
- Data/document management
- Infrastructure management
- Product analytics
- Quality assurance planning and testing
- Mechatronics
- Project and program management
- Quote process management
- Risk management
- Regulatory and environmental compliance management
- Supply chain management
- Engineering change management
- Prototyping
- Configuration management

These are just some of the challenges that manufacturers face during their product lifecycle. While previously, many manufacturers preferred to simplify their processes by adopting the PDM[3] method,
manufacturers found that this had many limitations. In the days when CAD was new and manufacturers had one product to deal with, warehousing the requisite data was easily addressed by PDM. However, as several other aspects began to materialise, like managing reengineering in real time, managing change, people and processes, integration into ERP systems, configuration and vendor management, etc. the complexities increased and forced the manufacturers to look for a solution that addressed the entire product life cycle rather than just the data. They needed a solution that could easily integrate with their existing work models and virtually rationalise requirements like NPI, stage gate modelling, prototyping, etc. (Rudeck, What is the difference between PDM and PLM?, 2013). They needed a solution that could enable collaborative working between the different internal and external teams and one that would reduce wastes and increase efficiencies.

What is PLM?

PLM or Product Lifecycle Management is the process that systematically approaches the several changes a product goes through right from design stage to development to go-to-market to retirement to disposal. It helps an organization to manage the lifecycle of their products better by eliminating wastes and redundancies and improving efficiency across parameters. (Rouse).

PLM can also be defined as an information management system that can be easily integrated into the different processes that go into making the product ready for the market. It manages people, processes, and data and effectively creates a chain of collaboration between them.

Advantages of PLM

Manufacturers across the globe will vouch for the fact that the success of their production depends on the how complete, accurate, qualitative and adaptive to change their plan is. Right from defining the manufacturing plan to rolling it out on to the shop floor to taking it out of the manufacturing facility to distribution, planning becomes the key. So, how does PLM facilitate easy and accurate planning across all capabilities for the manufacturer? Here is how:

- **Easy integration into existing systems** – The PLM software can integrate into all your multiple systems, software suites including CAD, CAM, CAE, etc. and seamlessly form a link between the full range of processes right from the top floor to the shop floor

- **Data and document management** – Planning, engineering and production teams can work together using a single source of information, which can break down geographical barriers as well. All information including BOM, product documentation, compliance data, etc. can be integrated in one place instead of maintaining separate silos

- **Form a connection between planning and production** – The machining data and requisite list of tools and processes can be directly sent to and accessed by the CNC machines

- **Easy access to Bill of materials (BOM)** – Teams can access reliable and up-to-date bill of materials that have already been approved for use
- **Manage change** – Manufacturers can use online workflows and approval forms to easily control any revisions and engineering changes.

- **Virtual testing** – All changes can be virtually tested first before they are implemented, which reduces not only the time taken but also effectively manages resources, people and costs. This also reduces the number of errors and redundancies.

- **Automated systems** – Enables easy and automated parts procurement from inventories and suppliers when a shortfall is predicted.

- **Meeting compliance and industry regulations** – Manufacturers can enable easy maintenance of all historical data, which can help them in accurately meeting several compliance regulations on time. Even SMBs can create formalised compliance management systems. This also helps to avoid unnecessary costs of compliance.

- **Shorter go-to-market** – Easy access to all data and processes and resources means expedited process cycles. The reduced timelines automatically expedite the time taken to the market as well.

- **Decreased costs** – It is estimated that approximately 70% of the costs in manufacturing could be reduced in the designing stage itself, where accurate and collaborative designing could easily and accurately predict costs (Rudeck, 7 PLM business benefits that every company needs to know, 2012). Costs such as those related to prototyping and scrap management as well as retooling can be brought down drastically.

- **Increase in productivity** – Engineers can spend more time effectively managing the processes rather than spend time on obtaining the right data and workflow. As this information is regularly and automatically updated, there is no fear of using redundant information. Since engineering changes are also easily fed in to the system, precious resources can be conserved.

- **Protection of intellectual property** – Manufacturers can easily protect the rights to their intellectual property using PLM solutions.

- **Quality of products** – Virtual testing and streamlined process flows automatically ensure better adherence to quality standards.

- **Enhanced relationships** – As the various teams, both internal and external, work with one single source of information, there is easy sharing of information and collaboration. Teams can now brainstorm and come up
Conclusion

Manufacturers are concerned not only about the efficacy and marketability of their product but also about efficient management of data, people and processes. A system that allows them to easily streamline and manage all of the above and still provide cutting edge solutions in the form to their product to the market is nothing short of a dream come true. Given this scenario, PLM is able to provide a way to quantify the ROI for manufacturers by giving them real time cost benefits and increased revenue due to reduced costs of operations, people, processes, testing, compliance, etc. Manufacturers are in business to make profits after all and if they can find a solution that helps them control costs, drive efficiencies and support revenue growth, then PLM has definitely come to stay.
References


About PROLIM:

PROLIM is a leading provider of PLM Software Services to industries like Automotive, Aerospace, Manufacturing Supplier and Life Sciences. Providing these services has helped the clients to enhance efficiency and top-line growth. As one of the fastest growing private Companies in America recognized by Inc 500, PROLIM being customer focused rather than product focused, the company envisions harnessing customer requisites by adding more satellite offices over the next few years in major metropolitan centers. PROLIM envisages reaching customers beyond borders to deliver effective services in the west and east coasts of the US, Canada and Europe and Asia.

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