ERP vs. PLM: What's the Difference?

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Most companies in the manufacturing sector have become familiar with data management systems of one form or another. Whether it is CRM, PDM, ERP or PLM, some kind of software is generally employed to manage the data needs at certain points in the manufacturing process.

Two of the oldest and most common data management systems are ERP (Enterprise Resource Planning) and PLM (Product Lifecycle Management). But what really is the difference between them? Recently, as many companies have sought to integrate the two systems, there has been growing interest in the topic.

Depending on the industry, and the specifics of the company that is implementing the system, ERP and PLM can function in a very similar way. Both systems keep track of your data and your property. Both have been proven as essential factors for successful manufacturing in the age of high technology. While ERP is used to manage the logistics of getting a product to market once a design is released, PLM, (being largely CAD-based) is used to achieve control over design and development information.

As Tom Shoemaker (VP of Product Marketing at PTC) points out in an online video, PLM is to your *intellectual property*, what ERP is to your *physical property*. In other words, PLM focuses on the planning before you commit to making a product, and ERP takes over from there.

Both systems, however, often require customization and their functions could overlap from one company to the next. For instance some PLM platforms have been expanded both upstream and downstream, thus taking over some functions formerly thought to be the domain of ERP.

In this whitepaper we will survey a lot of what's been written recently about the ways that ERP and PLM systems are being used by modern manufacturers. We will look at the competing definitions for both systems and try to determine which system is best used for which process.

Enterprise Resource Planning: ERP

Enterprise Resource Planning can refer to either a software system, or a business process that often includes an ERP software system. As an article on the IT Backbones website puts it:

"An ERP system is a business management tool used to fulfill the needs of many facets of a company including; finance and accounting, distribution, human resources, customer service and manufacturing. ERP supports these various departments by delivering improved processes such as an automated

method for order fulfillment, providing a single location for tracking cost information to ensure consistency, and helping human resources to standardize their information"

ERP is most often utilized as a tool to manage the logistics of getting a product to market, that is, every step of the business process after the product design stage. It collects and collates the essential data from the manufacturing stages of a product—redesigns, production runs, prototypes, etc. This might include test procedures, timelines, schedules and logistics.

According to a recent whitepaper by software provider Sage ERP, "ERP solutions have always offered powerful capabilities for managing operational data and improving business efficiency. Today's organizations realize that ERP solutions are critical to helping them serve customers throughout their lifecycle and providing the accurate, up-to-date information they need to make better decisions more quickly. And modern ERP solutions are delivering these capabilities with greater ease of use which further improves their benefits and ROI."

ERP Definition :

- It is a company-wide computer software system used to manage and coordinate all the resources, information, and functions of a business from shared data stores.
- ERP relates to the integrated software infrastructure that supports the entire company business process.
- ERP refers to a view of a company and all its parts as a connected whole, rather than small silos of activity.
- The term of ERP is originally derived from Manufacturing Resource Planning (MRP II) and Material Requirements Planning (MRP). MRP evolves into ERP when capacity planning activity and routing become a part of the standard software activity. From whatiserp.net

With an ERP system in place, users can see the entire work process at a glance to instantly determine where they are in the process and the steps necessary to complete it. It improves information sharing and collaboration across the business.

Again, quoting from Sage ERP, "Executives and managers no longer have to rely on spreadsheets or reports that have been compiled from multiple data sources and sent to them outside of the ERP

system. They can gain direct access to the information, which creates a single source of the "truth" and facilitates faster, more accurate decisions. For example, executives and managers can see high-level "snapshots" and can drill down to underlying reports to get more information."

Here is another view from ittoolbox.com:

- ERP systems typically handle a company's accounting, logistics, distribution, shipping, manufacturing, procurement and sales orders.
- ERP software can aid in the control of many business activities such as sales, marketing, finance management, inventory management, delivery, production, quality management and so on.
- ERP is a business tool that is usually comprised of several modules such as a financial module, a distribution module, or a production module. Each of these modules share information that is housed within the database structures on which the ERP system was coded. ERP helps to break down barriers between departments within a company.
- By utilizing an ERP system, the sales department, production department, operations management, shipping, financial department, purchasing department all have access to the up-to-date information that is needed to operate smoothly within any manufacturing environment.
- In ERP solutions there is only one database that is used by all departments, such as Sales, Production, Finance and Accounting, Maintenance and Engineering, Purchasing, etc. ERP applications contain several modules such as production, finance and accounting, sales and distribution modules, etc. Those modules are totally integrated and need only one database (to ensure no duplicate data). Each module consists of the best business practice that can be implemented for that company's industry.
- ERP is a combination of business management practices and technology, where Information Technology integrates with your company's core business processes to enable the achievement of specific business objectives.

Due to the scope of most ERP systems, many are not utilized for managing design or engineering data. Most ERPs are not set up to handle details such as vendor supplied documentation data, part specifications, or design and test notes. And, unlike a PLM system, ERP is not able to provide external manufacturing partners with access to data or development processes.

Most manufacturers tend to leverage their ERP system to handle all of their business-centric data such as inventory and purchasing processes. For control over design and development information, manufacturers generally turn to PLM technology.

Product Lifecycle Management: PLM

PLM can be a powerful management tool, creating visibility all along production, facilitating communication between essential personnel, and collating the mountain of data that accumulates during design and manufacturing. When a manager or management team needs data, they have access to it instantly. Rather than having to order a report and wait a few days to receive it, they can access their PLM tools and see instantly what progress is being made by designers, by contractors or by suppliers. PLM synchronizes data in a way that allows disparate workers, those separated by time zones, continents and languages, to work simultaneously as a team. And, by eliminating double entry of vital data, a PLM system saves time and avoids confusion.

A worthwhile PLM software application features customizable, industry-specific toolboxes that allow the user to communicate changes in materials, elements, or dimensions throughout the supply chain in real-time. This means that, using a PLM toolbox, a company can analyze the entire production cycle and communicate changes instantly to applicable suppliers, subcontractors, partners and employees whenever necessary. For instance, if a shoe manufacturer discovers that a certain type of leather will be unavailable in time to meet production deadlines, they can use a PLM system to determine what alternatives will be available, then communicate the details of these changes to the applicable members of the supply chain. Likewise, if a subcontractor finds out that there will be a delay on their end of the supply chain, they can communicate the details immediately, before a costly bottleneck occurs.

Here is a standard definition for modern PLM that is commonly used on the web:

"PLM is a strategic business approach that applies a consistent set of business solutions in support of the collaborative creation, management, dissemination, and use of product definition information across the extended enterprise, and spanning from product concept to end of life-integrating people, processes, business systems, and information. PLM forms the product information backbone for a company and its extended enterprise."

The PLM Technology Guide defines PLM as:

"an all-encompassing approach for innovation, new product development and introduction (NPDI) and product information management from ideation to end of life. PLM Systems as an enabling technology for PLM integrate people, data, processes, and business systems and provide a product information backbone for companies and their extended enterprise."

Elsewhere on the web we see PLM described like this:

"Product life cycle management is the process of managing product-related design, production and maintenance information. PLM may also serve as the central repository for secondary information, such as vendor application notes, catalogs, customer feedback, marketing plans, archived project schedules, and other information acquired over the product's life." http://www.product-lifecycle-management.com/

Documented benefits of product lifecycle management include:

1. Shorter Time to Market
2. Better product quality
3. Reduction in prototyping costs
4. Savings through the re-use of the original data
5. A framework for product optimization
6. Savings through reduction in waste
7. Savings through the complete integration of engineering workflows

Source: CAD Digest

As lean manufacturing becomes a necessity, and as the global market becomes increasingly competitive, manufacturers are always looking for ways to streamline their production, design, logistics and marketing. Both ERP and PLM have the capacity to make this happen by creating transparency over the lifecycle of their products.

The type and brand of data management software that you use will determine how PLM and ERP function. Some will allow for extensive integration between the two, other systems may be able to perform all necessary functions on their own without integration. Some systems are customizable and scalable, others are “out of the box.” How your company implements these systems also determines, to a large degree, how they will operate.

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