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Justifying PDM/PLM

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Introduction

The following brief will provide initial information regarding PDM and/or PLM justification. It is not our intent to prescribe a detailed method for justifying PDM or PLM. We prefer to work with each client to outline a specific method suitable for justifying the particular scope of effort they have established for the initiative. It is important to note that in some cases, no scope is defined and the justification activity will drive to a definition of scope.

Before we start, it is important to differentiate Product Data Management (PDM) from Product Lifecycle Management (PLM) as it relates to justification.

A PDM justification calculates a return on investment for what is largely the implementation of a PDM application.

A PLM justification calculates the return on investment associated with a systemic reengineering of Product Development and its relationships to various supply chain processes.

A PDM initiative is targeted to automate what are largely engineering administration tasks i.e., looking up a part capturing the part data, creating an association in structure, associating documents to parts, accessing/distributing documents, administering change, etc. - administrative functions

A PLM initiative is targeted at systemically improving engineering operations to increase competitive advantage. The objective being to drive revenue in to the business and better enable the sales and marketing functions – the other most important core competencies.

It is harder to justify PLM than PDM – but only because of the volume of data collection and analysis work to required to create the justification. In fact the return on investment for a PLM initiative is far greater than implementing and integrating a PDM application.

It is very important to set a clear expectation with senior staffs regarding the type of initiative you are proposing, PDM or PLM. Your proposal will depend upon specific targets in operational performance required by your strategic plan.

Justifying PDM

There are a number of ways PDM applications can increase productivity in an engineering organization. None of them will enable a large reduction of staffs. In fact, PDM applications are most accurately justified based upon opportunities to increase market share from reductions in time to market, costs associated with corrective actions born in engineering administrative tasks, product cost reduction, etc.. Organizations that justify PDM based upon cost avoidance or labor savings alone will likely fail to establish a measurable case for PDM.

Important to note, PDM applications are sometimes justified as an imperative to long-term operational improvement. Basically, it is hard to conduct systemic reengineering of engineering processes when the administrative work is not automated and producing a high yield.

There are several **quantifiable benefits** that can be calculated when justifying PDM. We will explore some of them below:

Engineering Change

Companies absent a PDM application often suffer long cycle times for EC processing. As a result, rework, warranty returns, warranty repair and scrap costs can be unnecessarily high. This opportunity can be studied and will produce results that will often establish significant value for shortening the cycle time to process changes.

Note: It is false to believe the EC capability in PDM apps will reduce EC volumes. In fact, when implementing PDM using CMII principles, EC volume often increases. The resulting increase is an excellent result as it will enable early warning of design issues and can reduce corrective actions downstream. Additionally, when the EC system is constructed to capture true root cause and phase or stage gate metrics, it can be an invaluable tool to point to opportunities to reengineer process and improve engineering operations.

Many organizations suffer from substantial volumes of rework to engineering changes that were not completely processed first time through. PDM systems can be configured to eliminate this EC rework.

Document Control

Implementation of PDM places the burden of document associativity, dissemination and access on the end user. As a result, many companies have eliminated the document control department thereby eliminating associated costs.

Part and Supplier Rationalization

Part reuse capability in PDM often produces significant justification. The key is to first understand that part and supplier rationalization is best controlled at the engineering workstation. PDM applications and secondary tools like Global Spec or ASPECT can enable an organization to flag preferred parts that are supplied from preferred vendors based upon criteria like performance, price per unit, delivery and service level. Securing available reductions in cost of purchased parts requires the implementation of a classification schema that enables engineers to search for parts by attributes and ranges for particular attributes. The PDM system can then provide exact match or comparable part and inform the engineer as to the preferred vendor part number that is established through evaluations made by the purchasing staffs. The bottom line is better leveraging of your buying power. Finally, the operational overhead associated with managing all of the transactional work, design work and handling work for every redundant part is eliminated.

Time to Market

Calculations can be made to determine the increase in productivity by job type that the PDM system will provide based upon scope of the implementation. Once known, you can establish a typical team size for a given development effort (new product, enhancement of existing product, etc.). You can then align the productivity gains to the various team constructs/effort types. Once completed you need only determine the average number of efforts conducted annually by type to calculate the foreseeable reduction in Time to Market. With this data, you can work with the marketing department to understand the potential increase in units sold that can result from a reduction in Time to Market.

Note: while this is an interesting justification, we should inform you that when you increase productivity in engineering, the first improvement you would likely get is an increase in design yield that will result in some reduction of corrective action work. It can be argued that the resulting reduction in corrective action work has the same result in contributing to a reduction in Time to market.

It should also be noted that PDM systems often increase the administrative burden at the engineering desktop. The productivity gains should be established understanding the increase in administrative overhead.

Productivity gain categories can include but may not be limited to the following:

- Time to process engineering changes
- Time to process fixes to EC's that failed first pass yield

- Time to access documentation
- Time to find reusable parts
- Time to select preferred suppliers
- Time to construct BoM's
- Time to assemble RFQ's
- Time to disseminate product related data
- Time to validate designs and conduct stage gate reviews
- Etc.

Product Cost Reduction – Secondary Engineering

Many organizations conduct secondary engineering efforts on released products to reduce product cost. Similar to calculating time to market opportunity, you can decide to target productivity gains in pursuit of product cost optimization during the initial development effort – optimize cost per unit sold using productivity gains and get to market same time as now or a little faster.

Justifying PLM

The biggest difference in justifying a PLM initiative is its focus on identifying systemic improvement opportunities that will generate revenue and increase margins.

Justifying PLM requires a substantial up front effort to identify process disease that prohibits your drive to strategic objectives targeted at increasing revenue and margin. It is substantially more complex than conducting a statistical analysis of improvements to administrative activities that can be repaired through the implementation of a PDM application. It is also worth noting that executing a PLM initiative is more complex.

A PLM initiative can affect changes to the following processes:

- Proposal Engineering (for ETO products)
- Requirements Management
- Design Engineering
- Design Validation
- Manufacturing Engineering
- Release to Manufacturing
- Serviceability Engineering
- Product Launch
- Integration to Outsource Manufacturer Processes
- Integration to Preferred Supplier's Processes
- Integration to Preferred Customer's Processes

The reengineering and automation work that is typically conducted in each of the process activities listed above will drive changes to the following:

- Policy & Procedure
- Job Descriptions and perhaps Organizational Structures
- Management & Measurement Techniques
- Values & Beliefs
- Related Technologies i.e., PDM, CAD, CAE, KBE, ERP, Vendor/Customer Portals, Project Management tools and Time Reporting systems

To conduct a justification exercise for PLM, the following work activities are required and in the sequence listed below;

- Develop detailed current state models for targeted processes. Note: Please visit the DSA website for a comprehensive discussion regarding the proper method for building current state models. Please note that the RAO method outlined at our website is proprietary and can be used only with the expressed written permission from an authorized DSA

representative. www.dsasite.com

- Capture the problems with inputs, execution and outputs for each current state model
- Establish the true root cause (disease) for each problem (symptom)
- Determine the process metrics required to calculate severity of problem and potential value for treating the disease and collect the metrics. Note: it is very important to have an experienced process analyst to assist you with this stage of work. You must know what analytical tools you will use to conduct this analysis i.e., Time and cost analysis, Pareto, Fishbone, Yield analysis, Seven wastes analysis, identification of systemic archetypes force field analysis, etc. It is also very important to note that you will use several of these analytical tools in sequence to build a complete understanding of each disease targeted for analysis. Therefore you must have some experience knowing when to use particular sequences of analysis.
- Apply the analytical tools and do the math
- Establish measurable improvement opportunities and dependencies
- Prioritize attack – be mindful of dependencies
- Calculate justification for prioritized attack
- Establish Project Charter

For additional information and discussion regarding justifying PDM and/or PLM please contact Kenn Hartman at (216) 533-6302.