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# PLM Customization and Implementation for satisfying OEM Need for effectively managing Product Development Data

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## ABSTRACT

Product Development is a process and it creates huge number of data throughout its lifecycle. Such data is used by various number of stake holder for effective management of their tasks and for easiness of their work. Such data is accessed by multiple stake holders at the same time and hence helps in concurrent engineering. But as a size of data and complexity of development increases there becomes a need for managing such data more carefully. Here comes PLM in picture. Product Lifecycle Management is concept and not a tool which is used for improved management of processes, excellent control over data, activities. Also it helps in managing engineering changes i.e. Engineering Change Orders and Engineering Change requests through a proper channel and with better sign off capabilities. There are different PLM systems available in the market, but it is very important to study and analyze the usage of these systems for organizational benefits. Also it is very important to make changes in OOTB PLM solutions which are more relevant to organization. This paper gives introduction to PLM and its capabilities. Also various tools and methods for implementing customized PLM are discussed. PLM solution used here is ENOVIA V5 VPM which is provided by Dassault Systèmes, the 3DEXPERIENCE Company, provides business and people with virtual universes to imagine sustainable innovations.

**Keywords—** Customization, Data, PLM, Processes

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## I. INTRODUCTION

Product Lifecycle Management (PLM) is art for managing company's product configurations and offerings through its entire lifecycle in the effective and most efficient way. Product Lifecycle Management is the process and not tool which can be used for a product for managing the whole lifecycle of a product from its birth or conception, analysis, design, manufacture, and after sales service with feedback. PLM integrates company's different assets like people, processes, data and business systems and provides needed product information for companies and their partners

or suppliers. PLM is a strategic way that resembles a consistent bunch of business processes in support of the collaboration, concurrent engineering, data management and information distribution, and use of product definition information across the enterprise, and covering from product concept to end of life with integrating people, processes, business systems, and information. PLM forms the product information hub for a company and its aligned companies like suppliers or partners. PLM/PDM is an art of managing the entire data and its repository in a centralized manner, in a way that this data can be accessed and utilized for managing the complete life cycle of the Product

Lifecycle Management is an art of managing the entire lifecycle of a product from its conception to disposal.

### ENOVIA V5 VPM

ENOVIA VPLM can best be defined as a database that holds all the data related to a deliverable product. This data can be in the form of CAD files, engineering documents, trade studies, etc. Since ENOVIA holds all data pertinent to a product, it also acts as the interoperability agent between the ENOVIA database and the associated application the data is derived from. This allows for a single source for data storage and retrieval. ENOVIA VPLM as a whole can be considered an object-oriented database. This means that all “things” put in the database are treated as a single object with attributes. Being an object-oriented database allows ENOVIA VPLM to hold all different types of files. All objects in ENOVIA VPLM will have a specific object type. ENOVIA VPLM as an application is actually made up of four different parts. There is an ENOVIA database which holds all the metadata and attributes for all the documents, files, and parts stored in the vault. The database also manages users, permissions, and other ENOVIA specific objects such as product classes, actions, change orders, and other additional items. Vault in ENOVIA is physical file location located on the server for storage purpose. The vault will contain an encrypted form of all the data managed by the database. The third part of ENOVIA VPLM is the ENOVIA server itself. The server process is what manages communication between the client, the database and the vault. User never access the database or vault directly, you always communicate with the ENOVIA server. The last part of ENOVIA VPLM is client. The client is what user will use anytime he wants to interact with the ENOVIA database or vault.



Fig. 1 ENOVIA V5 VPM UI

### I. PLM IMPLEMENTATION

On a very high level, there are two major implementation methodologies for PLM; one is Waterfall and another one is Agile. In Waterfall method is a sequential process, often used in software development and implementation, in which progress is seen as flowing steadily downwards (like a waterfall) through different phases. The original Waterfall method included the phases Requirements Definition, Design, Implementation, Verification and Maintenance but today there are many variations dependent on the type of project or area of application. This method is relatively easy to manage, but it provides less flexibility to adapt to changes during the project and because of its sequential approach

projects usually require more time to complete. The Agile method is based on iterative and incremental development, where requirements and solutions evolve through collaboration between cross-functional teams. It promotes adaptive planning, evolutionary development and delivery, a time-boxed iterative approach, and encourages rapid and flexible response to change throughout the development or implementation cycle. The Agile method generally requires very tight control and management of scope, schedule and cost, and having an experienced project manager is critically important for the successful use of this approach.

Over the past decade, product life-cycle management (PLM) has matured beyond its engineering product data management (PDM) origins into a proven management approach relevant to a wide variety of business functions and operating environments.[5] Amid this growth, however, both executives and managers often struggle to articulate the business value of PLM in their environments, wrestling with a few strategic parameters that can widely affect the business viability of the initiative, including:

**Wide breadth of users:** From its roots in product design, PLM has expanded to a veritable cross-functional, life-cycle management process that often involves stakeholders from sales, marketing, sourcing, manufacturing, quality, and aftermarket services. This means that firms often struggle not only to prioritize which users receive functionality first but also to deliver the necessary training, coaching, and leadership attention to ensure a successful change.

**Variable process scope:** As part of this user expansion, manufacturing and service firms alike are seeking out expanded PLM application functionality in order to better integrate product development activities with these constituents and deliver real improvements in product development effectiveness. But although PLM is a comprehensive process by definition, the individual limits and scope of PLM expansion tend to vary widely based on industry, process maturity, and specific company objectives.

**Disconnected measures of success:** When seeking to improve a company's product development effectiveness, executives commonly consider strategic measures such as time-to-market, design efficiency, and production costs as critical to program success. However, all too often, measurable impact on these high-level metrics proves elusive to managers seeking to drive more-pragmatic improvements such as speeding change-order cycle times, reusing a larger percentage of designs, and reducing product defects and rework.

### II. CUSTOMIZATION

Once requirements are finalized, PLM solution is decided to be used (In our case its ENOVIA VPLM) next step is a technical one. In this step after deciding the strategy user proceeds with the actual customization process.

#### A. Infrastructure

It's always advisable to use recommended platforms for implementing PLM Solutions from the solution providers. It can be find out from their websites.

#### B. Licenses

Required licenses should be arranged for starting the implantation of PLM solution

### C. Customization

Its then advisable to use recommended tools for the customization. For this work, IBM Rational Software Architecture is used for the customization purpose. Its is a comprehensive design, modeling and development tool for end-to-end software delivery. It uses the Unified Modeling Language (UML) for designing enterprise Java® applications and web services. Rational Software Architect is built on the Eclipse open-source software framework and is extensible with a variety of Eclipse plugins. You can also enhance functionality for your specific requirements with separately purchased Rational extensions.

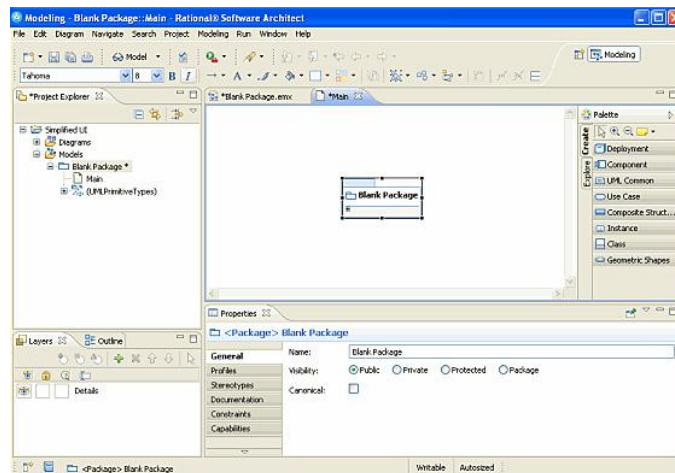


Fig. 2 Rational Software Architecture UI

### III. CONCLUSIONS

In a small scale industry or any industry which uses all the manual processes is a paper work and is a lengthy process, where in with this project all the industry processes and product lifecycle will be automated using PLM processes and tools. This will help the organization to reduce time to market of the product, also in preserving all the important information and data in a safe with easily extractable features. But while implementing PLM capabilities, it is also important to keep in mind about the risk factors associated with data security and data integrity and intellectual property management. This work will also keep focus on these factors by performing customization as per need from the organization.

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