PORTAL PRODUCT LIFE CYCLE MANAGEMENT FOR RETENTION IN AUTOMOTIVE PRODUCT

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ABSTRACT

This paper proposes Data and Process Management to facilitate the Teamwork in a collaborative product Development with internet and intranet support system environment. Nowadays very high competition in Global marketing with global & local customers. So, we need to increase the Manufacturing process globally. To implement these processes will require integrating people, process, machine and computers. The total development is meant for customer satisfaction as per customer specifications.PDM PORTAL is an integrated, information approach to all aspects of product, from customer's, manufacturing deployment and maintenance with finished product.PDM PORTAL suites enable accessing, updating, manipulating and reasoning about customer, process and product Globally-Locally. This integration takes place through well accepted human and electronics protocols. So, try to introduce the new concept to integrate PDM, ERP, CRM and SCM (Product Data management, Enterprise resource planning, Customer relations management, and Supply chain management – product, processes, customer and Web Protocol Development. For this integration time to be reduced to develop the product and time to market as per customer satisfaction and this trend expected in next generation. The Data and Product Process to get and Distributed geographically. PECS implementation in enterprises is aimed at delivering products faster making Product development process more systematic as per customer requirements. PECS system includes storage, Inventory, processing of Design information and manufacturing Data in an engineering organization with Product Centric approach. We develop architecture for Product Master Data [PMD] that includes CAD/CAM/CAE of Design and Manufacturing Process of Automobile Industry. Therefore we suggest through this support can access all design and manufacturing information in the enterprise must be Web-based because of its universal Data efficiently using with distributed Data. Using this scenarios and systems we will show effectively using PECS Tool support geographically access for Time to Market.

Keywords: Product Management; Process Management; Product master Data; Data management; Geographically access; Supply chain integration.

INTRODUCTION

This paper describes PECS includes storage and processing of design and manufacturing information in an engineering organization with product-centric-approach that supports the product throughout its entire life cycle geographically. In this PECS system master data is hold only once in a secure 'Vault' where its integrity can be assured and all changes to it monitored, controlled, access and recorded.

PECS system is able to manage with attribute and documentary product data as well as relationship between them through a relational database management system.

Various functions that are expect,

Product centric information management, product structure and documentation management, component relationship, associated documentation design, testing etc, process management, Manufacturing data – CNC manufacturing program codes, inventory management, supply chain management, work flow, work history management, business and engineering management, process control management,

engineering change and configuration management, Life cycle of the product management.

ROLE OF RESEARCH

In real life situations many product we deal with are variants of generic product. In one automotive brand consist of number of several interior parts and other parts arrangements. Its ideal to model products as a generic one and derive the real products as an instance of this generic one. This approach makes meaning and saves lots of programming efforts and improves of the solution using this PECS tool. In an environment life cycle can be represented as fig.1 sequence of phases, gates and fig.2 shows phase process1 to process5 criteria wise. With this representation the product becomes easy to come time to market geographically at a Time.

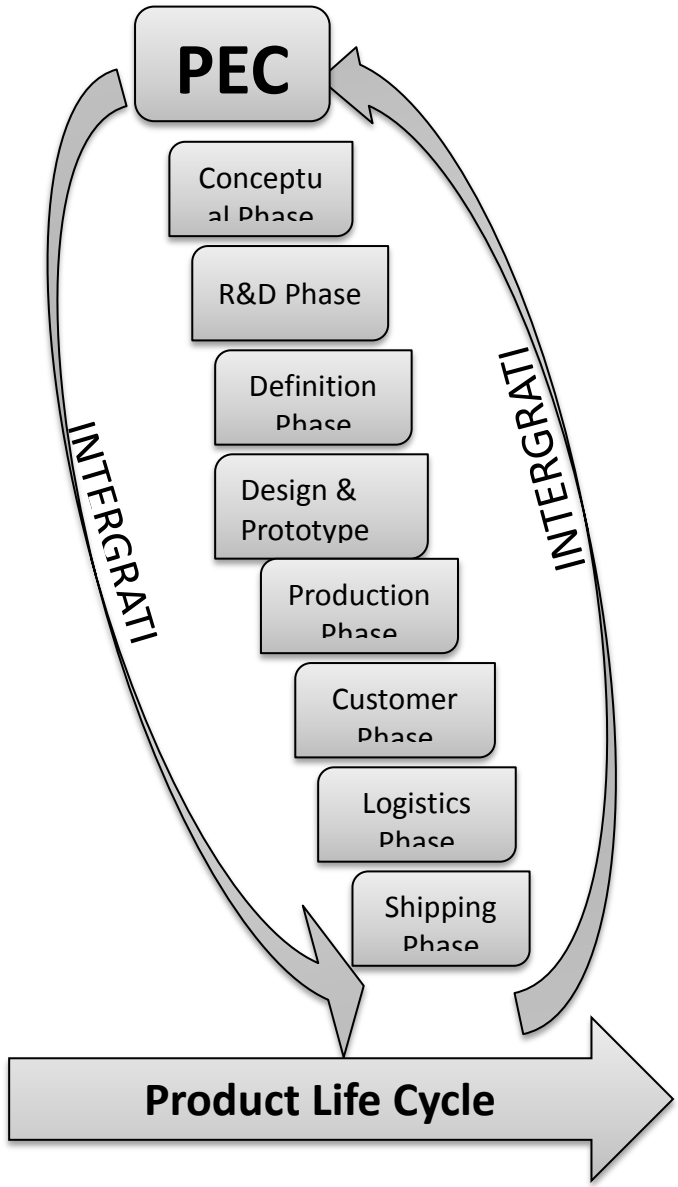

Fig.1. Integrations of Process definitions

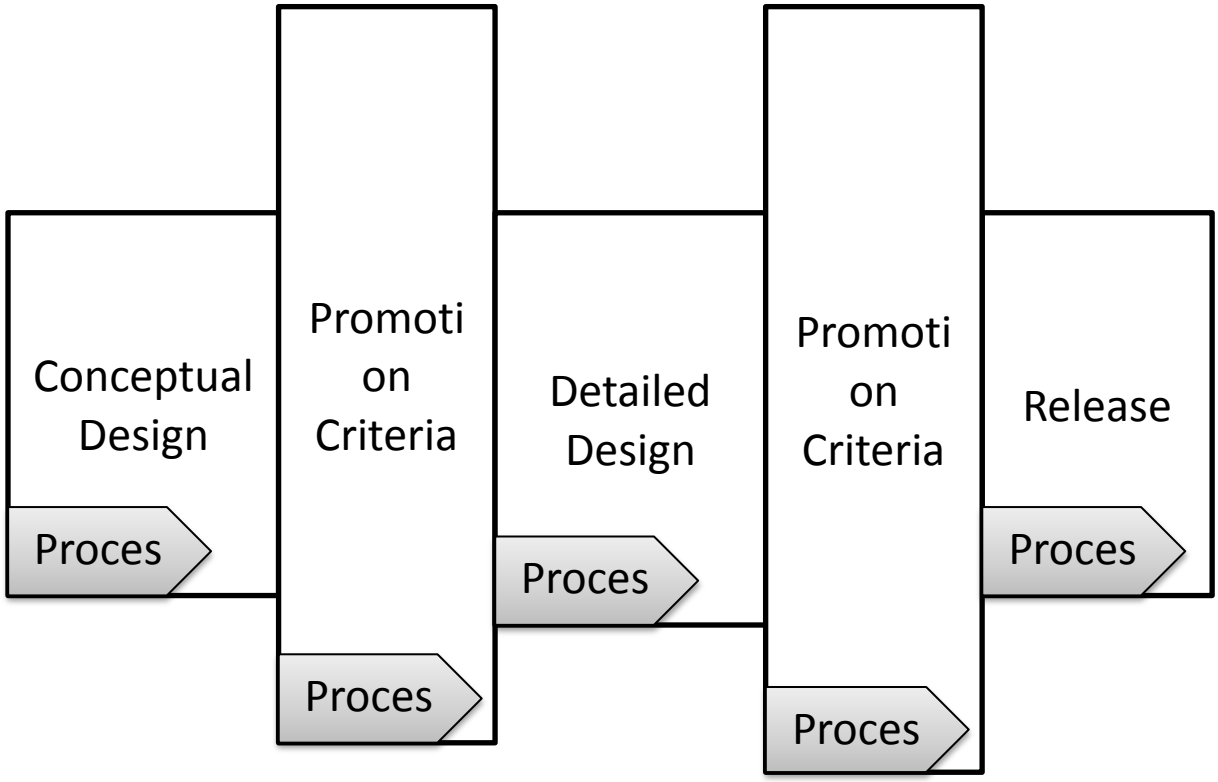

Fig.2. Design Process criteria

PART VERSIONING AND CONTROL

It is form, fit and function compatible with all other part versions for a given part master. Data contents such as CAD files are referenced at the part version level. Part version contains information that is unique to a specific design instance of a part like version designator. A version is

Multiple part versions

visible to the enterprise version is identified by a revision letter.
It is qualified by life cycle state.
May be qualified by a view name.
May only be worked on by one uses at a time via check in/check out mechanism.
All versions of an object have a common identify.

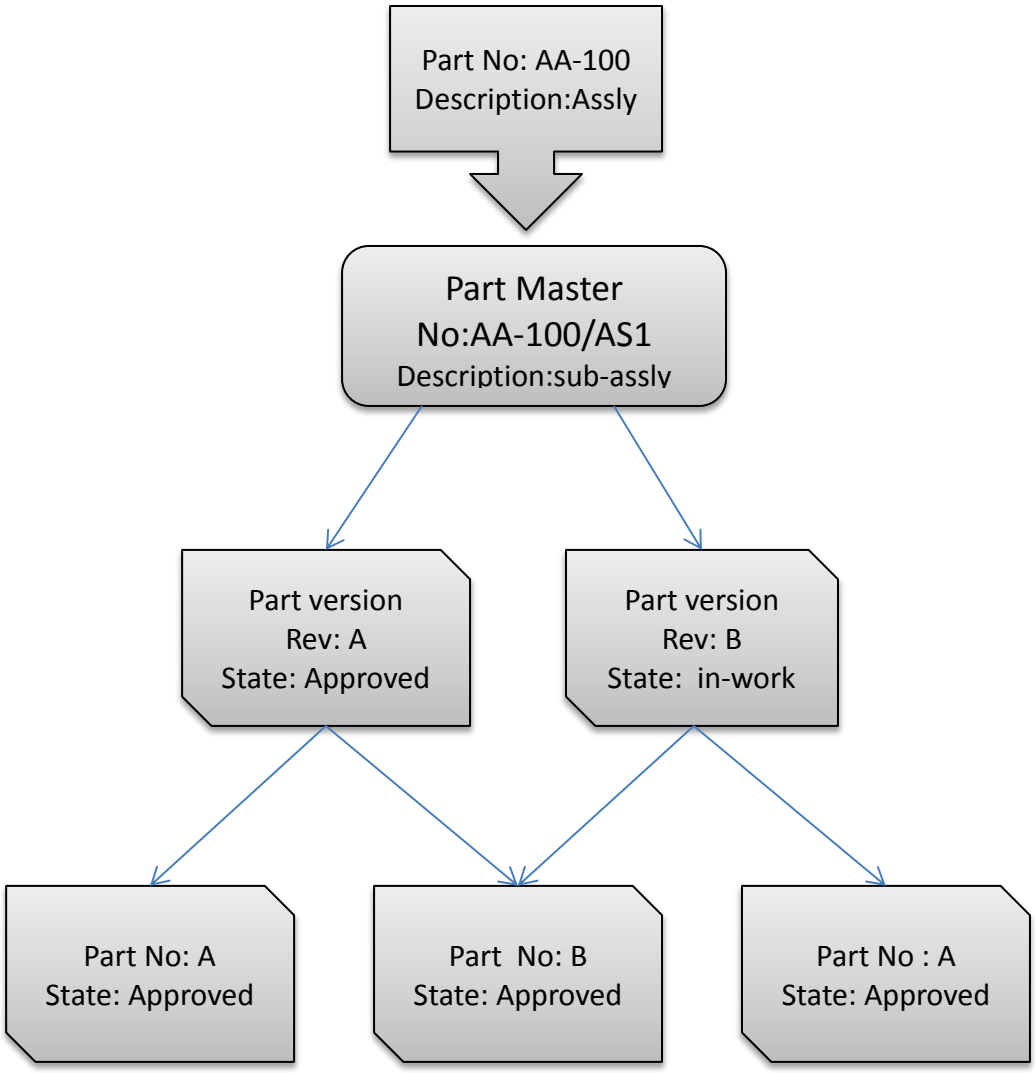

Fig.3. Part versioning in Part Master

For example in one model of automotive car having no of versions like LXI,VXI,ZXI or VLX,DLX,ALX…some changes have been done in the headlight, tail light, indicator light, some interior changes by changing specific parts.

A mechanism for controlling concurrent access to information and tracking small interactive changes described in Fig.3. Identifying some iterations as significant to the enterprises. Allowing versions to evolve independently. And some component parts is revision as shown in fig.4.

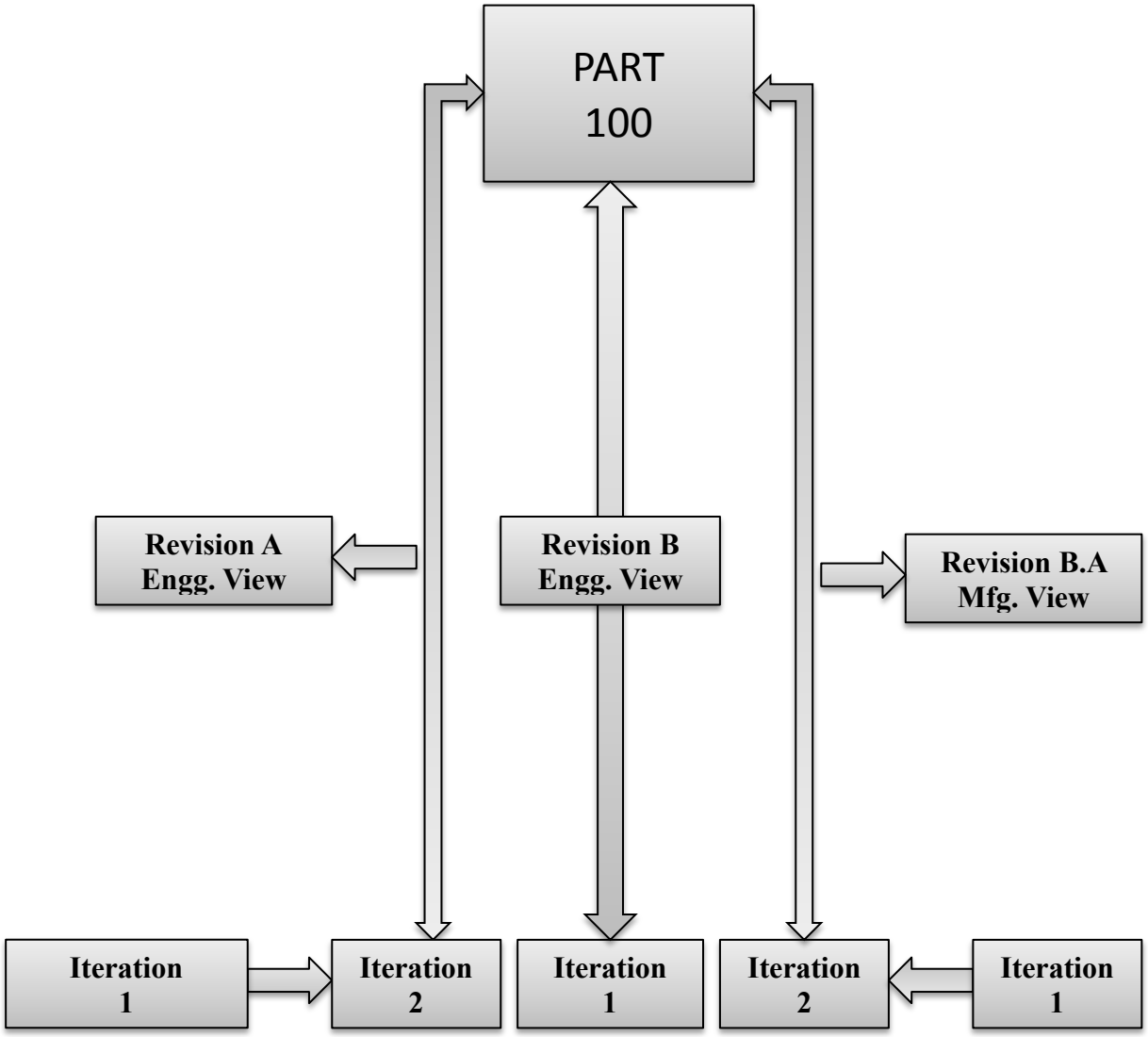

Fig.4. Revision A,B,C of Part

Versional information controlled by checking into and out of vault. Each piece of business information is represented by a master object. When checked out a working copy is placed in the checked out folder. When checked back in iteration is created. Versions residing in personal cabinet may be modified directly. Versions in shared cabinets must be checked out to be worked on. A working version is not available to others until checked in. From a version may examine the history of previous iterations of that version. PECS version control is conceptually similar to that found in source code management system.

PRODUCT DEVELOPMENT INFORMATION MANAGEMENT

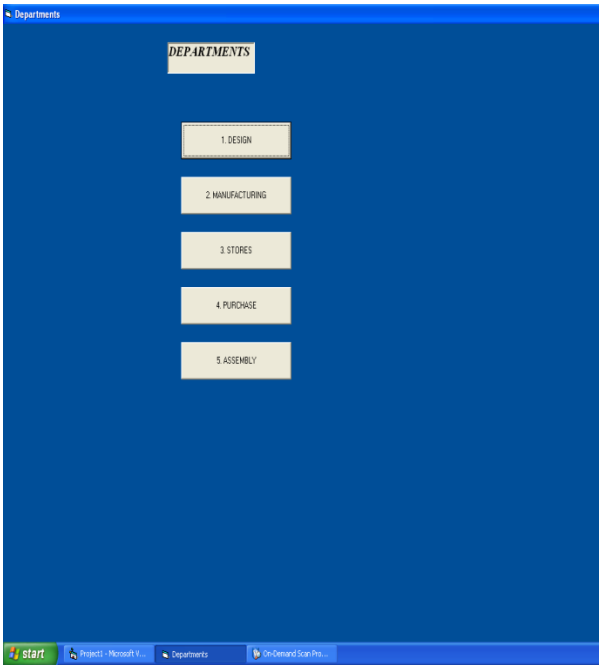

Fig.5. Department wise data management in PECS

Information and document management

In PECS system, the document is managed by product database in department wise as shown in fig.5, that is the part and documents associated with its are represented in a hierarchical way. Product structure enables product definition and controls Bill of Material generation. Management of product configurations along the life cycle. Product structure is derived by defining the relationship between the part masters and part versions and freezing them by assigning certain values to the attributes of the part version. Product structure represents the product by Name, Number, Life cycle, Project, Process. Product structure should be properly defined and it should be having flexible structure to that it can be revised. Complete knowledge of the product is available in product structure. In order to develop a new product and old product data is required, thus product structure helps in providing complete product knowledge.

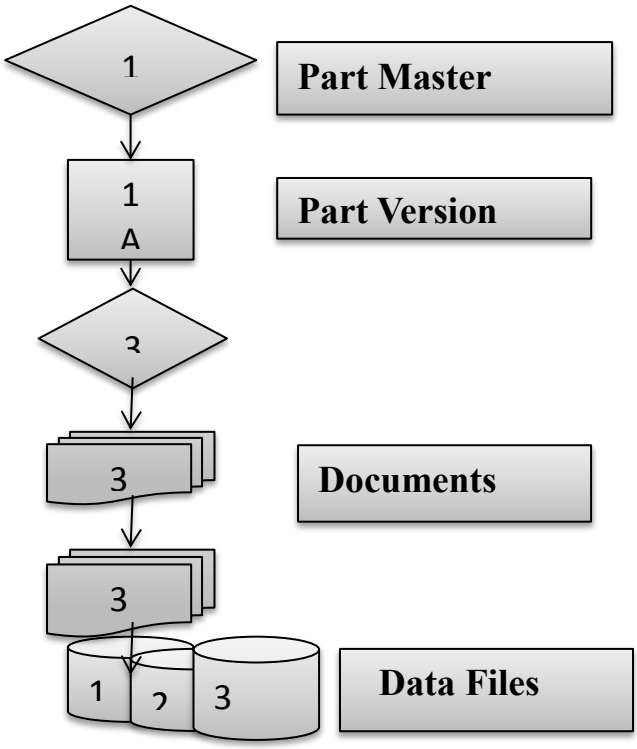

Fig.6. Documents and Data in Part Master with version

Create, Update, Delete, Initiate changes Control the information management process based on life cycle state, polices and class of the business object and track the history of this process.

PECS TOOL SYSTEMS BY OEM'S

OEM's are involving in discrete manufacturing.

The discretion of the product may be only in some attributes whereas the majority of the attributes remain the same.

Data Management

Manufacturing companies are usually good at systematically having records for components and sub-assemblies, but often do not keep comprehensive records of attributes such as size, weight etc.

Process Management

They manage what happens to the data when someone works on it [work management]

They manage flow of date [low management]

They keep all the track of events

Lifecycle defines an object states.

Workflow moves objects through their states.

Workflow templates can be associated with lifecycle phases and gates.

It is worth to develop an IT enabled WEB based solution and moments that happen during history of project.

Data Duplication

The PECS system prevents the data duplication of each department. This is prevented by developing products in an object oriented approach.

Store the common attributes of the object class in the part master and the distinguishing attributes indifferent part versions.

Then supply configuration management through the effectively tool to get desired product as and when required.

PECS SYSTEM IN DESIGN DEPARTMENT WORK FLOW IN LIFE CYCLE

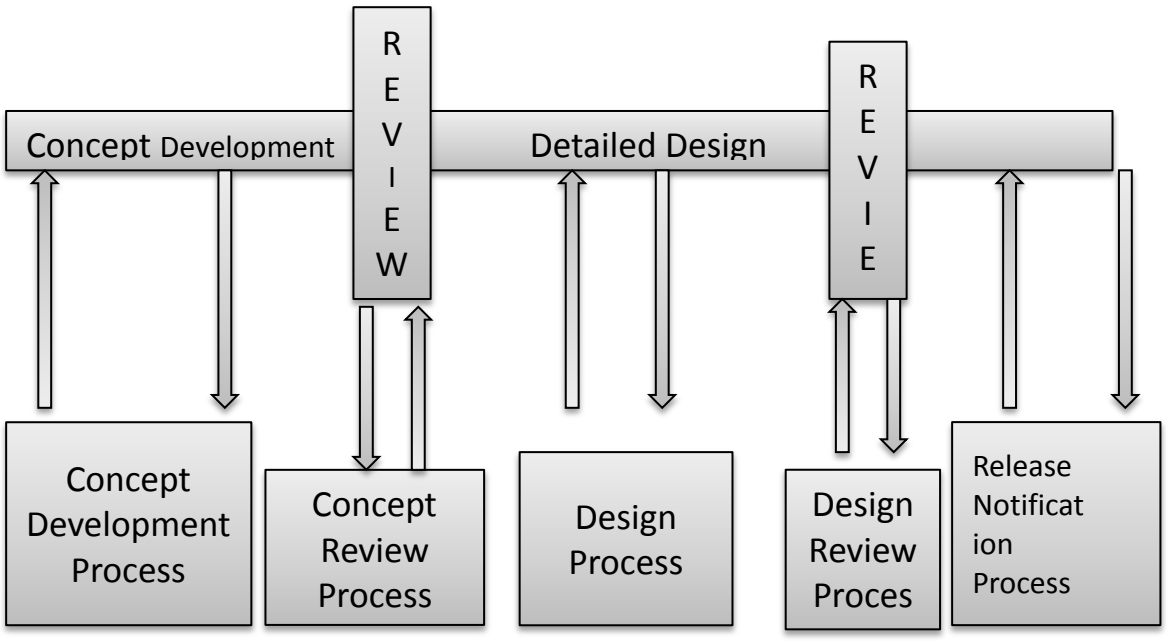

Fig.7. PECS Process work flow and review in design

Discrete manufacturing enterprises

PECS systems can be implemented only in discreet manufacturing enterprises. Assuming the given product as discrete one, because these types of values are designed based on customer needs. Since it is a product to suit with various specifications referred by customers, definitely IT enabled solutions will be very much useful to the enterprise involving in manufacturing.

Advantages of the enterprise,
Reduced time-to-time market
Improved design productivity
Data integrity
Better management of engineering change
Better control of projects

6.2 Product Scheme

Since the PECS systems can handle any amount of data, the documents of the industry in which are numerous are not a problem at all as shown in fig.9.

Fig.8. PECS Process in manufacturing.

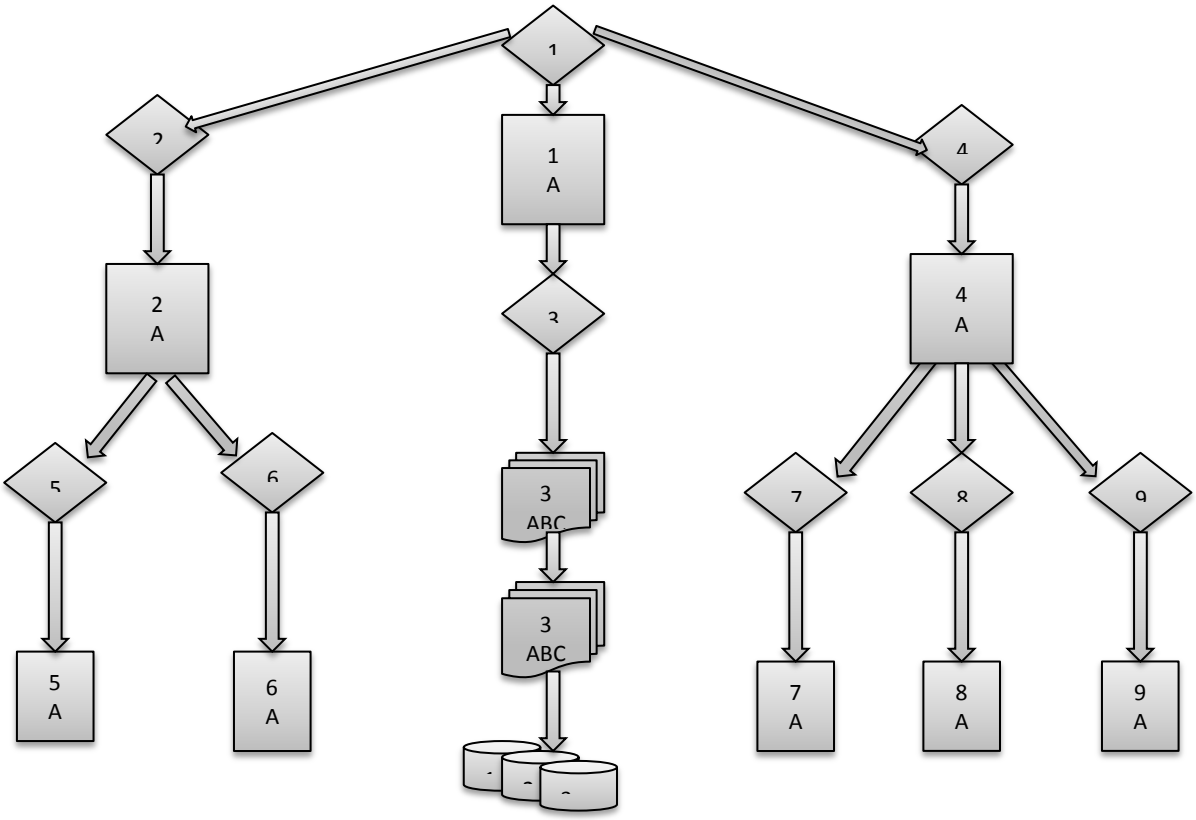

Fig.9. Data Process in system.

Complete data about this product are understandable by the "product systems" in the new PECS solution.
This product structure contains all the details of the product, no matter how voluminous it may be.
This product structure helps very much in retrieving the document whenever necessary.
This product structure contains part master and part version will help to produce different versions based of effectivity.

New solution generate BOM's for different departments

In the PECS solution, each and every department will look for their own Bill of material. For example,
Design department – Design BOM
Manufacturing department – manufacturing BOM i.e. searching for M/C tool material availability.
Material Management department – logistics and Inventory BOM
Maintenance department – servicing, overhauling, etc
The above will be generated in the solution with the help of product structure and view versions.
The administrator has the control to generate different views for different departments, this will help the manufacturers to prevent data duplication.
Therefore, according to the views, the respective BOM will be shown to the particular department.

Data duplication in different departments

The significance of the PECS system is no data duplication. Therefore, there is no possibility for data duplication. This can be controlled by check-in and check-out. These processes for making the business objects are available for modification by various permitted users of the enterprise. This works in accordance to the access control policies defined by the PECS administrator.
Check-in: while checking a part out of the main database, a working copy of the original part is placed in the check-in cabinet [to maintain iteration and version history] and in shared cabinet and then the part becomes unavailable to check-in to the other users. After the part is updated it is checked-in to the shared cabin.
Check-out: while checking a part put of the shared cabinet, a working copy of the original part is placed in a personal cabinet and the part becomes unavailable for the check-out to other users. After the users view the part and checks-out, the updated part is saved in the main database and the older version is processed by the new one.
Thus, for each check-in and check-out process, the iterations are stored and there is no chance o data duplication.

PROCESS FLOW OF PECS AND IMPLEMENTATIONS IN EXISTING PROCESS

Change issue: It holds the problem symptom information.
Standard attributes: Number, name, description, creator, creation date, priority [Emergency: High, medium, low], Category [design issue, cost reduction, safety issue, quality improvement].
Change request: It proposes a product change and is the object that organizes the other change objects. It represents a formal, trauable change.
Standard attributes: Number, name, description, creator, creation date, need date, priority [Emergency: high, medium, low], category [design issue, cost

reduction, safety issue, quality improvement, other].

Analysis activity: It is used in conjunction proposal to organize the work required to complete the investigation or suggest a solution.

Standard attributes: Number, name, description, creator, creation date, need date, results

Change order: it is created if a change proposal is chosen for implementation to organize the work required for completing the change.

Standard attributes: Number, name, description, creator, creation date, need date.

Change investigation: The change investigation organize the information pertaining to the root cause of the problem.

Standard attributes: Number, name, description, creator, creation date, need date and results.

Change proposal: The change proposal organizes the information pertaining to a solution for a problem.

Standard attributes: Number, name, description, creator, creation date.

Thus using the above said change objects which are present in the ECN, one can change the drawings, parts or any design. Thus it is present in the configuration item and effectivity. So any chance can be made using the configuration management nodes, in which change objects are available. After implementing PECS in existing process, growth in production and profit shown in fig.10.

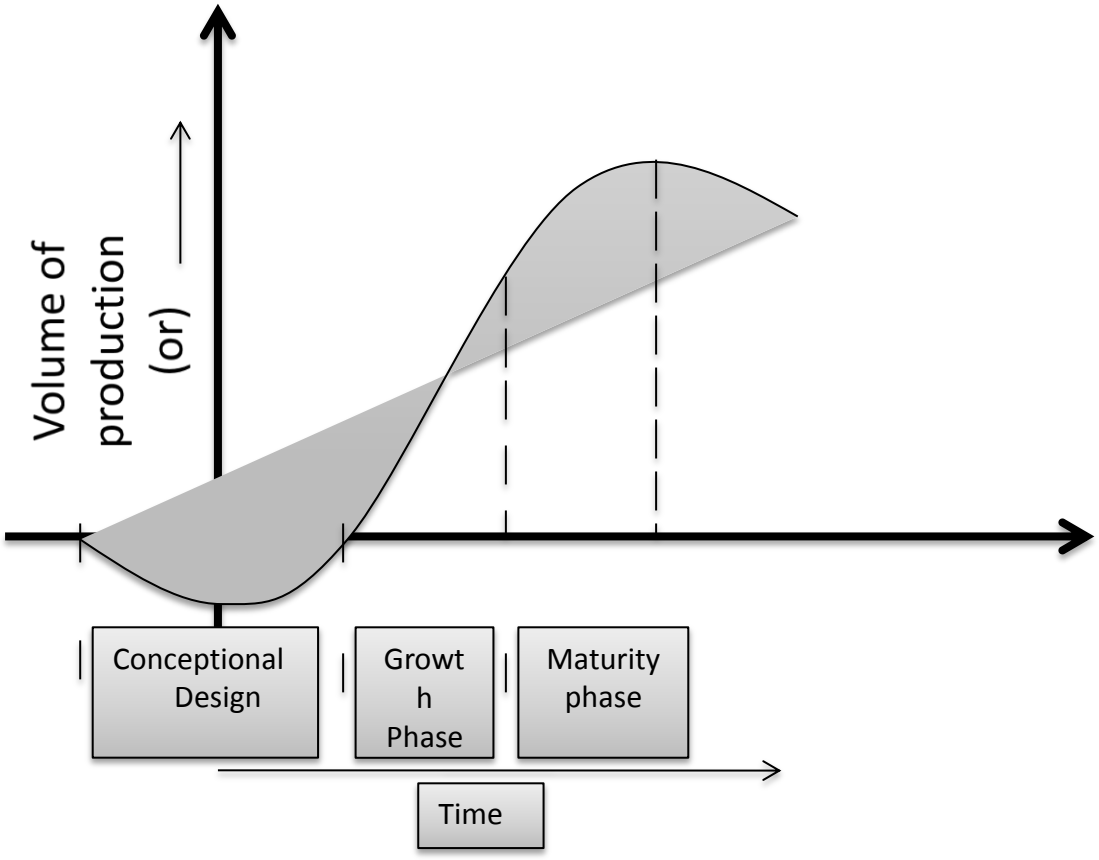

Fig.10. Growth in Production and Profit.

DISCUSSION

PECS Completion and Business Practices,
PECS helps to increase the achievable profit.
To achieve maximum profit within shorter time
To predict product deaths so as to achieve the maximum profit in the phase after the maximum profit point utilizing the same product skeleton as for as possible.
Thus PECS forms the main business object to find the concept of time in the industry.
Flexible manufacturing planning is achieved by the workflow.
Workflow makes arrangements for the manpower planning in industries.
Automating process using workflow results in improved efficiency.
The discipline that is enforced by a workflow engine results in more predictable system behavior.
Process based integration of systems makes it possible to automate process which previously was not possible. This reduces the cost.
Dynamic monitoring of process as well as auditing of process becomes possible.
Resources can be used more optimally with motivated team members focused on business priorities which match their skills.
Need to track change
Change is new / changing an existing.
Changing business, policy, changing material
Change may be field requirement feasibility, technical change issue.
New products also introduced with a change
In configuration PECS system and management – we have to use change management. PECS tool may have Version A, B, C
If we use a particular one, change is to be implemented.
Change management is basically a life cycle product
Change requests may have so many details/content i.e., quality, financial statements
Lifecycle and workflow are combined to make it work.
Business object
Type of product developed
Design development
Number of group working
How to manage the processes
Many have the practice of products

CONCLUSION

The benefits that organizations perceive in PECS vary greatly, so metrics do not lend themselves to be standardized into a framework that can be easily-applied across industries, and organizations. As organizations develop and implement each new technology, software package, and system infrastructure, a comprehensive leadership vision and effort is required to fundamentally change the way an organization works. The current leading philosophy driving the next wave of technology for rapid new product development is PECS, a holistic business strategy built on lean-thinking principles. Since 2001, businesses have launched PLM initiatives based on the understanding that if successfully implemented, now, PECS leads to enterprise-wide efficiencies and innovative opportunities. While it is critical that organizations understand their expectations of PECS and track its impact, it is also vital they develop visions and future-state technology roadmaps to guide their implementation of future PECS advancements. This dissertation is concentrated on identifying roadmaps for PECS advancements, and the organizational strategies required anticipating and successfully

implementing these emerging technologies.

Acknowledgements:
The authors are grateful to and wish to express their constructive valuable comments and suggestions, which help us to improve this project greatly.

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