

Customization of BMIDE at Customer End as per Business Requirement

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ABSTRACT

In today's competitive environment most of the Information Technology Enabled Services (ITES) industries having large amount of product data in the scattered form as the industries become bigger and bigger. Manage the CAD/Design data in an efficient way with existing infrastructure which can maintain the version of changes in the CAD data, also speedup the cross functional team to align the design updates. Currently Caresoft have 5000+ parts in folder by end of this year it will be overall 15000+ parts will be added up to 25000+ parts approximately so to manage these data at various level of company need rigid solution on it, so PLM implementation arises. This project provides best industry practices at various levels like Creo data management, Document Management, Engineering process management, Provides security, Bill of Material management, Queries, Report generation Data relational management. Project also provides solution in structure manager, access manager, change management, workflow designer organization creation etc

KEYWORDS: PDM (Product Data Management), ERP (Enterprise Resource Planning,) PLM (Product Life cycle Management), AMC (Asset Management Company), BIW (Body in White)

I. INTRODUCTION

Today's industries require quick changes, recall technology switches, innovation implementation and so on during the development phase to be the best in their stream. Thing scattered become inconsistent, duplicated, corrupted as the organization grows bigger and bigger [1]. Modern day automobile are made complex mechanical component, electrical or software having to produce everything in house so working in collaboration with highest possible security in place is key critical.[1] PLM provide the freedom to achieve this with versatility it offers in the best of it. Automobile companies need to maximize the reuse of part, assemblies and best practices across their global vehicle program [2]. Automobile companies are challenged to design and develop more complex, vehicle faster than ever in an increasingly competitive global environment with requirement related to safety, fuel consumption etc. PLM implementation helps to focus more on innovation collaboration and change process themselves versus the data or tool or integration of the business as a whole [3]. Teamcenter provides to synchronize disciplines during design, simulation, testing, verification and validation based on multidisciplinary functions for an automotive company.[5] Currently mass customization, small lot sizes, high variability of product types and a changing product portfolio are characteristics of modern manufacturing systems during life cycle. A direct consequence of these characteristics is a more complex manufacturing system. This problem is especially serious in the aerospace and defense industry.[6] According to a recent study of Government Accountability Office, growth in

research and development costs and months' delay in delivering.[6].

II. Site survey / Questionnaire

Preface: Site survey is part of the preliminary for Teamcenter Implementation Project at Caresoft. The information will play major role in identifying the best possible site infrastructure, configuration and solution mapping. This survey is addressing various topics which may not be relevant to the current project but required to achieve the project objective answer to the below question are important.

A. Establishing objectives and goals for your PLM strategy:

This will give you a clear picture of which processes need to be more formalized now and which ones can wait until some point in the future. That understanding will help you define your PLM needs and plan gradual upgrades and improvements that are less likely to disrupt the work environment. Establishing clear objectives and goals will also enable you to measure the success of the PLM implementation process and the success of your new PLM processes and/or systems. [1]

B. Part numbering and part naming conventions:

Part numbering and naming conventions help ensure regularity across all bills of materials. When using Excel, a good way to store this information is in a master parts list or

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item master that can be accessed by everyone who needs it. [9] Generating part numbers from a central location or list greatly reduces the likelihood of creating duplicate parts. When naming conventions and item masters are in place, engineers can more easily find and reuse existing components instead of unnecessarily creating duplicate parts. [4]

C. The Difficulties of Managing Multi-Level BOMs in Excel:

Excel BOM spreadsheets are a common tool for small and mid-size manufacturers just beginning to manage product data. But while Excel offers some initial benefits—it is essentially free and easily accessible—managing multi-level BOMs in Excel can be extremely tedious and time consuming. [8]

D. PLM Manage Multi-Level BOMs:

Arena PLM, bill of materials and change management, offers a more efficient approach to managing multi-level BOMs than Excel. Because the software is built on a relational database, you can create an unlimited number of one-to-many and many-to-many relationships, which prevents data entry mistakes and eliminates product data ambiguity. [10] You can also mass replace a single part in several locations within a BOM or in multiple disparate BOMs—saving hours of time and eliminating BOM discrepancies. [11] Additionally, Arena PLM enables you to capture and analyze material cost information on indented BOMs. With product information stored in Arena PLM, it is possible to track component-level estimates and quotes from your suppliers. Thus, you can calculate the cost of an assembly from quotes, past purchases or estimated costs. Because you have access to real-time costing information across all your multi-level BOMs in Arena PLM, you can realize what impact product cost will have on profitability. [7]

III. System Development

For Development of system we have flow chart in that we have different parameter and procedure to achieve the following objectives

1. Large no of part, and sub part randomly distributed in database
2. There is no control on revision of parts and their coding
3. There is no part numbering provided for the BOM so that access of particular part data/BOM/BVR becomes difficult.

More time requires creating Bill of Material with checking all required condition i.e. main part should have 12 digit codes, subpart or child part should have 11 digits, this is difficult task in manual BOM management.

A. Flow chart of Customization

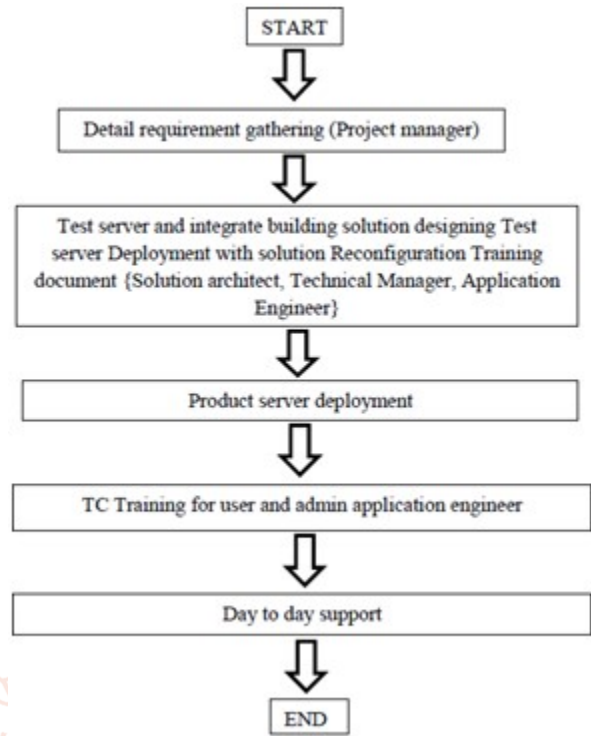


Figure.1 Flow chart for Customization

A. Need of codeless Customization

Industry has 4500+ parts, in CAD design data for all the parts, their changes i.e. revision. It becomes difficult to access as Well manage all the parts and their revision. So there needs arise to number code for all the parts also control over the revision. These tasks efficiently and effectively performed in BMIDE.

B. Codeless Site Extension/Configuration

Create a below subtype of Item for achieving business value

- a. Categorizing business data to understand and store in database
- b. Different rule for (item_id, item_nameetc)
- c. Default workflow/project association
- d. Different custom properties on IM & IRM forms

Item

- >Caresoft_Part
(Caresoft_Part_Code&Caresoft_Part_Revision_Code as a property attached to object)
- >Caresoft_Part_Ass
- >Caresoft_Part_Cust
- >Caresoft_Part_Eng
- >Caresoft_Part_Logtc
- >Caresoft_Part_Manuf
- >Caresoft_Part_Toolg

IV. Result

Open Teamcenter User Interface, as shown in below figure.



Figure2. UI of Teamcenter

Search the item Caresoft_Part and when we create in that item two properties are visible like caresoft_part_code and caresoft_revision_code

After login into the TC search item Caresoft part, it will be appear in the dialogue box click on it and then click on the next button.

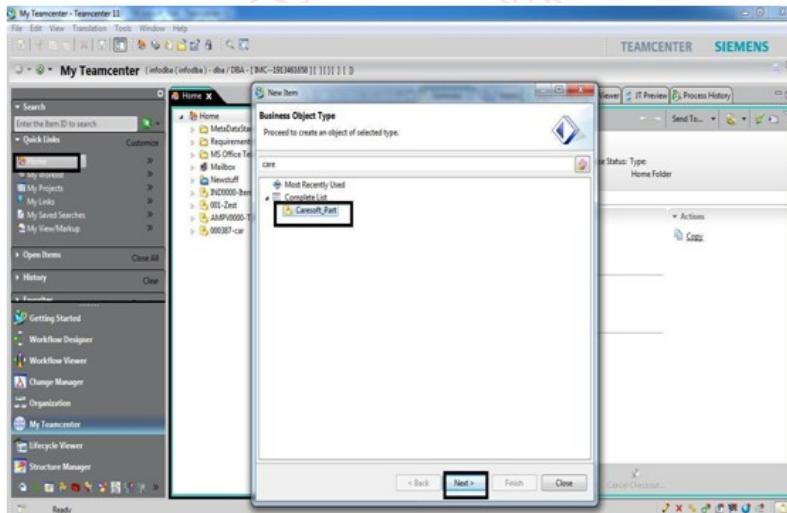


Figure3. TC search item Caresoft

Add various required LOV's to properties on IM/IRM form

Go to the Caresoft_Part then go to the properties to add to it property material type

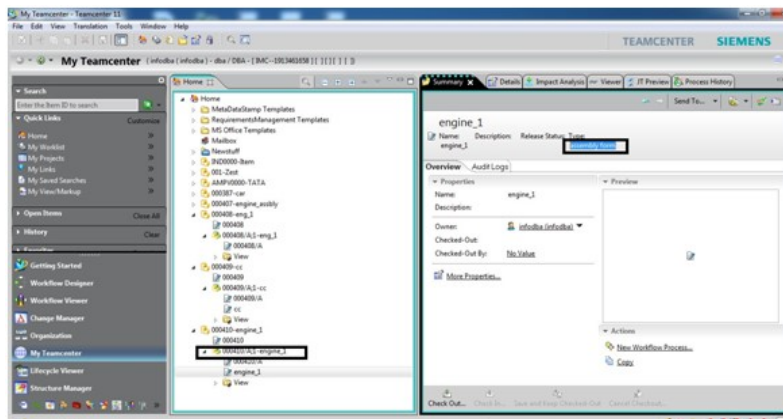


Figure4. List of Values (LOV's)

By addition of property and LOV's to material type it will directly appear on the master form in the Teamcenter

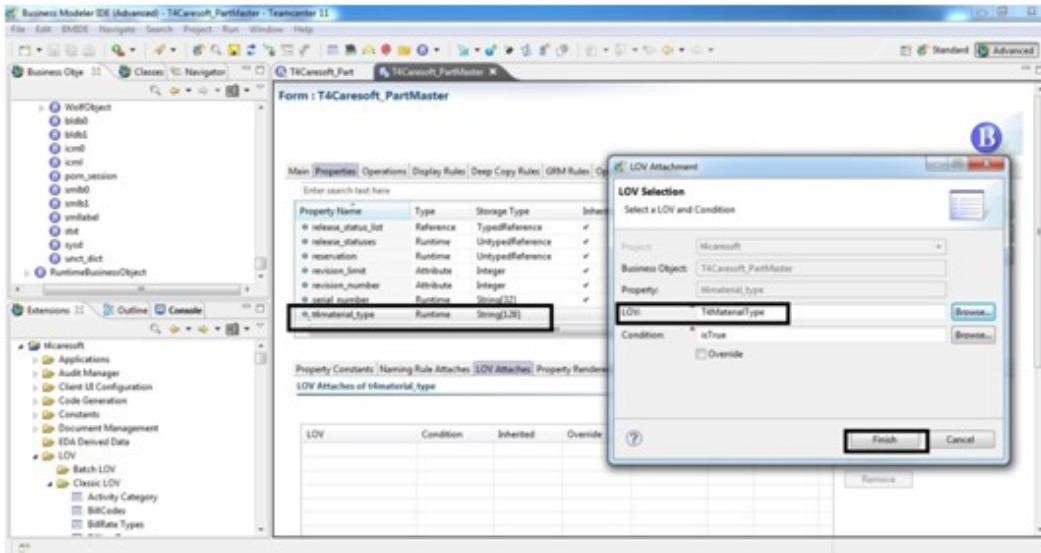


Figure5. Adding the property

V. Result of Customization

Now login to Teamcenter for result what the customer require will be display into the Teamcenter interface.



Figure6. Login to TC

Search item Caresoft_Part_ass then create new item in it- Chasis_1

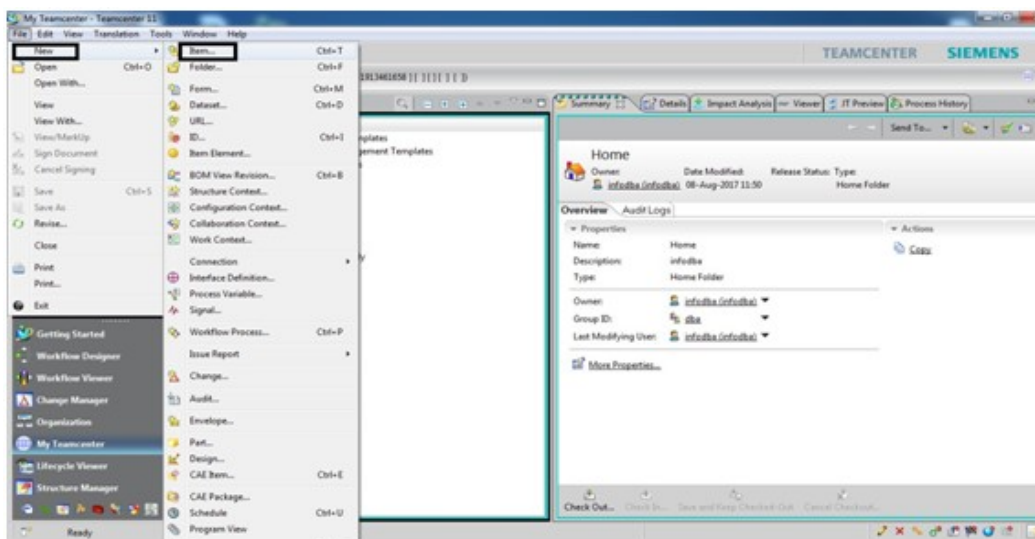


Figure7. Item Search in TC

Create a naming rule for all ItemType as

- Caresoft_Part --CP|| NNNNN
- >Caresoft_Part_Ass --CPA|| NNNNN
- >Caresoft_Part_Cust --CPC|| NNNNN
- >Caresoft_Part_Eng --CPE|| NNNNN
- >Caresoft_Part_Logtc --LOG|| NNNNN
- >Caresoft_Part_Manuf --CM|| NNNNN
- >Caresoft_Part_Toolg--CPT|| NNNNN

Customer wants above naming rule for their product parts.

A. API (Application Programming Interface)

API is the most important small c program which plays important role in the code full customization. API like ITEM_CREATE_ITEM-this API CREATE ITEM in Teamcenter,

ITEM_SAVE_ITEM-this API Created ITEM SAVE into the Teamcenter without entering into the Teamcenter with c program. No.of API is used into the code full customization.

In fig. 5.1.1 program written for the Bill of Material initially serial no, item id, part reference no, weight of the part, quantity of the parts are define in structure of c program.

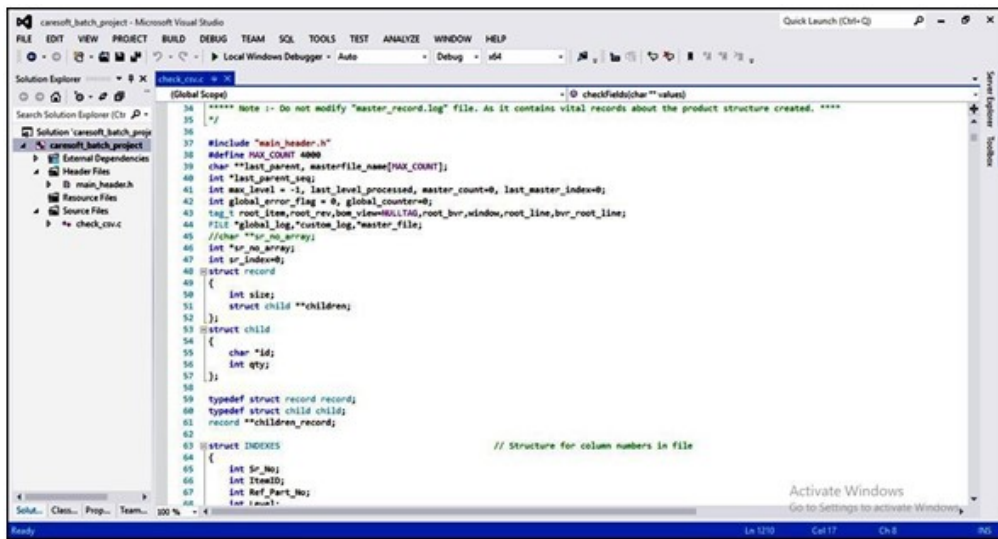


Figure8. API (Application Programming Interface)

B. Convert csv file into the Bill of Material

Csv file is the file available in the form of line format but separated by commas. Comma separated values are mostly available at the time of generation of bill of material. Like Sr.No. Name of the part, Material of the part, Quantity etc.

Such file need to be convert into the firstly into the excel file and then convert into the bill of material. Csv file is shown as below

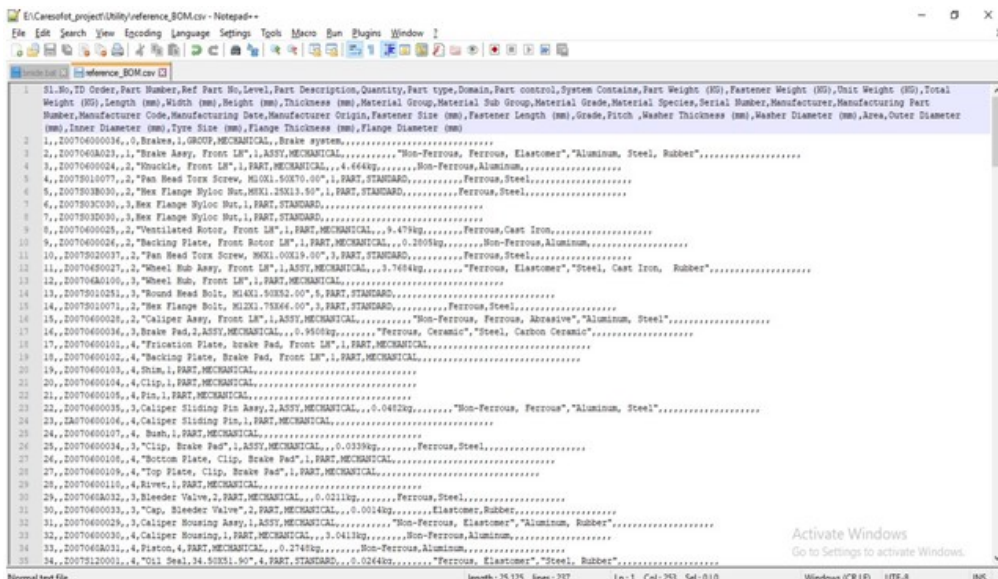


Figure9. Csv file is shown as below

CONCLUSION

The following conclusions can be drawn from this research regarding the developed system

- 1 Multilevel Bill of Material can be generating with less time and manpower by using API utility.
- 2 Systems engineers were able to create models quickly
- 3 Same work can be utilized to increased work in organization e.g. random data in sequence, control on item revision, with revision rule etc.
- 4 The successful implementation of Teamcenter is significant for enterprises and especially systems engineers in addressing challenges easier and quicker.
- 5 Large quantity of data can be converted into the BOM

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