

Enterprise Design Process Automation with Vault

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Learning Objectives

- Learn how to identify a digital strategy for the design team to integrate Vault workflows to business applications
- Learn how to create a clear integration and linking methodology to synchronize Vault Items and BOM to your ERP system
- Learn how the user can solve integration issues while using non-Autodesk design or non-design documents with their regular design workflows
- Discover the extent to which Vault can be customized to meet multidepartment

Description

In this class, a CIO of a leading ship-building company from India shall be jointly presenting with a partner a case study of their custom implementation of Vault software as a business process automation platform to synchronize their design and business workflows to their Enterprise Business systems—Infor ERP. The class will explore how various departments of a ship-manufacturing organization works around the design data that flows between various users and integrates critical items and BOM with their ERP system and automates several business workflows customized on Vault interface. The presenter will explain how they could save close to 20% of their design-to-manufacturing cycle time by streamlining Vault product data management (PDM) software to remove redundant work on ERP while enabling a collaborative and automated business environment. This class will explore the extent to which Vault can be customized beyond its basic features, and throw light on integration of BOM and related data to ERP or other applications

About the Speakers

Aravindan Subramanian

Head of ERP /IT / Systems and responsible for ERP /IT / Systems and deployment of Digital initiatives across L&T Shipbuilding. Has 25 years of experience in various industry sectors. He has the Domain expertise in Automobile, Mfg., IT Software & Service organizations. He was head of Global delivery in his earlier stint in IT Sector. Holds a Master's degree in Business Administration following his Bachelor's degree in Engineering (Gold Medalist). He holds certifications in PMP, PMI – ACP, ITIL- Expert and Master Black Belt in Six Sigma in addition to other lead certifications in IT / Quality and Lean Manufacturing.

Kirubakaran Candasamy

Chief Technology Officer, KKMSOFT (P) LTD.

He is the technology and innovation head of KKMSOFT, which is a leading gold partner to Autodesk in India. He played a key role in implementation of Autodesk Vault as a business automation tool at L&T along with the speaker, Aravindan and enabled the team to implement the solution to meet all the business needs of the customer keeping the core strengths of Autodesk Vault as a platform.

His role in KKMSOFT is of a solution architect to enable Digital Business transformation solutions integrating IoT, AI, Virtual and Mixed Reality, cloud, Mobility and Automation tools from Trimble, PTC, IBM, Microsoft and Autodesk for Government, Smart Cities, Defence, Large Enterprises, Medical, Manufacturing, Engineering, Education and related Industries.

His expertise includes:

- IoT for Industrial processes, Smart cities, Manufacturing and business processes
- Maintenance, Asset and Facility management solutions for Railways, Smart cities, Buildings and Industries
- Implementation of PLM/PDM/QLM/SLM along with Cloud and Mobility enabling of Business Processes
- Industrial and Professional class Virtual Reality, Augmented Reality and Mixed Reality
- ETO Design Automation and Product Configurators and Sales process automation
- BIM and Process Plant Specialties.
- CAD / CAM / CAE software design and development.

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Enterprise Design Process Automation with Vault

Introduction

Ship Building industry is a complicated production process, which involves huge amount of Material & Labor requirement. Being in a Project environment, ship construction requirements various from project to project. The drawing required for the ship construction runs in thousands and each drawing have 5 to 6 ancillary documents like Item code, BOM, specification etc. All this documents have a role to play in the different departments. Some documents are used for Procurement of Materials, some used for issuing the materials from warehouse, some provides technical specification to production and the list goes on... To handle such high volume documents and complicate Business Process, Product Data Management "PDM" only is not enough.... Need an Automation over PDM which can simplify the business process, eliminate human efforts and reduces the time line...

In Project environment, with Functional Organization structure, Department works in silos. To overcome the issue a system based workflow process is needed to ensure smooth flow of information to the respective departments. Also building an interface with the existing system will ensure seamless business operation.

Challenges in Shipbuilding Process

The existing business process had few challenge both on business process and maintenance cost.

- Limitation in the customization:
 - There are some limitations in the existing system to accommodate the Business process which leads to involvement of Human interface and time delay in the process.
- Unavailability of Controls on Document creation:
 - No system based control exist for the creation and release of documents to the production.
- Unavailability of Status Tracking:
 - Proper tracking system is not available regarding the overall drawing planned vs released status.
- Access Credentials:
 - Access credential process in the existing system is not fool proof and user with basic credentials are also able to create and release documents.
- Transparency:
 - No alert mechanism to the users on the release of documents.
- Drawing release checklist:
 - Each type of drawings having different sets of check list and no provision in the existing system for system based checklist. Design maintained the check lists in hard copy.
- Interface with other system:

- Interface with other existing system was build, however it has lot of issues regarding flow of information & data.
- Time consuming Activity:
 - Existing system takes long time for uploading and downloading of the documents.
- Lack of proper customer support:
 - Customer support was not to the need of the business requirements. Resolution for the issues taken longer time.
- User based license:
 - Need of procurement of license to all the users.

Why Vault

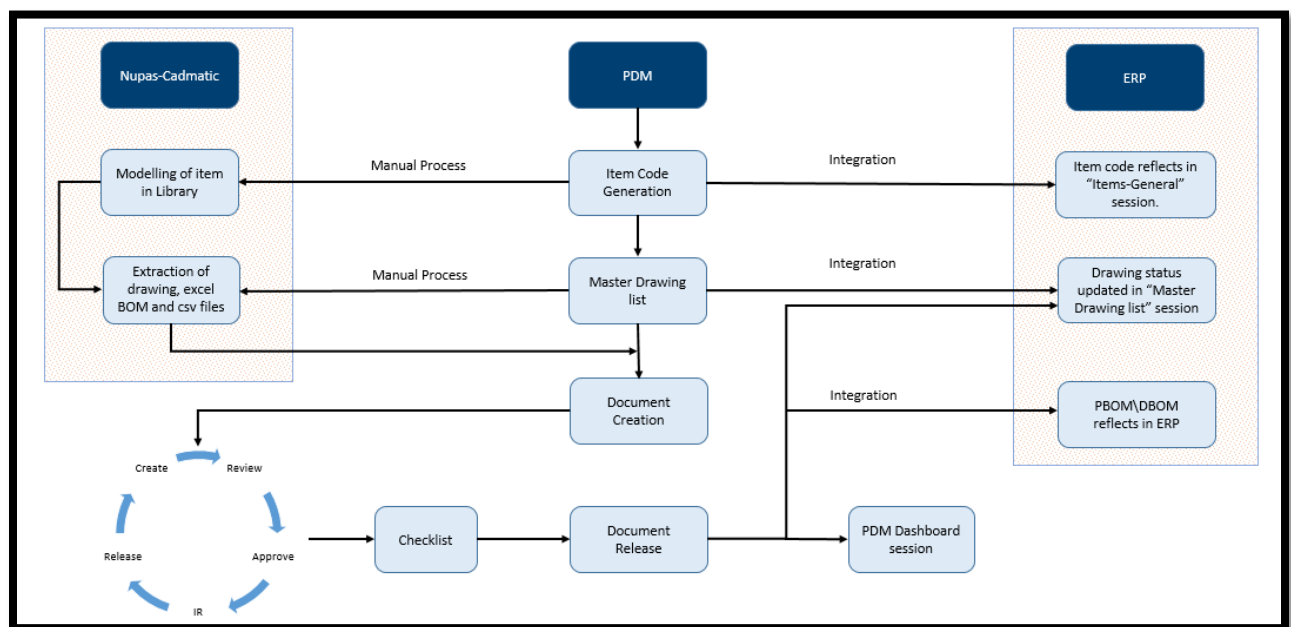
- To handle high volume document and to track the life cycle of each document
- PDM vault is flexible enough for maximum customization. Around 28 Customization have done to meet the business process.

Workflow explained – Flow digaram

Design is the Primary Information Generator for the Business Process. The data and information generated by design is used in various business process across various functions. The data and information generated from 3D model software is integrated to PDM vault and PDM vault is the central repository of data and information access to all departments and functions. This information is processed across the various departments and functions to execute respective business processes. Various interfaces are built between PDM vault and other enterprise and legacy systems to have seamless flow of data and information.



- Business Development department uses the costing BOM from vault for preparing the Project Estimations.
- Supply chain management procures the material or allocate the existing inventory to the project based on the procurement BOM from vault.
- Drawing release status and activity wise BOM are being used by Planning department for release of Work Authorization.
- Drawing wise Scope Of Work from Vault helps Production to understand the Job to be executed.
- Ensuring the quality of the Product by the Class / External agents approval comments details maintained in the Vault.
- The Strong interface developed between the PDM Vault and ERP provides a Smooth business process. The existing excel macros maintained at user level were made inbuilt in system which leads into a single platform for Item code creation. With the help of interface between the Vault and ERP, the Item code is automatically updated in ERP and thus eliminating the manual process of creating the Item code and resulting is huge saving of effort and standardization.



The Master drawing list maintained in the Vault provides the project wise list of drawings to be prepared by design. It also as the provision to maintain the planned scheduled release date against each drawing helps designers to track their priorities.

The Workflow based approval process ensures the information generated by the designers are reviewed and approved through workflow mechanism by respective stakeholders before the drawings hits the production floor.

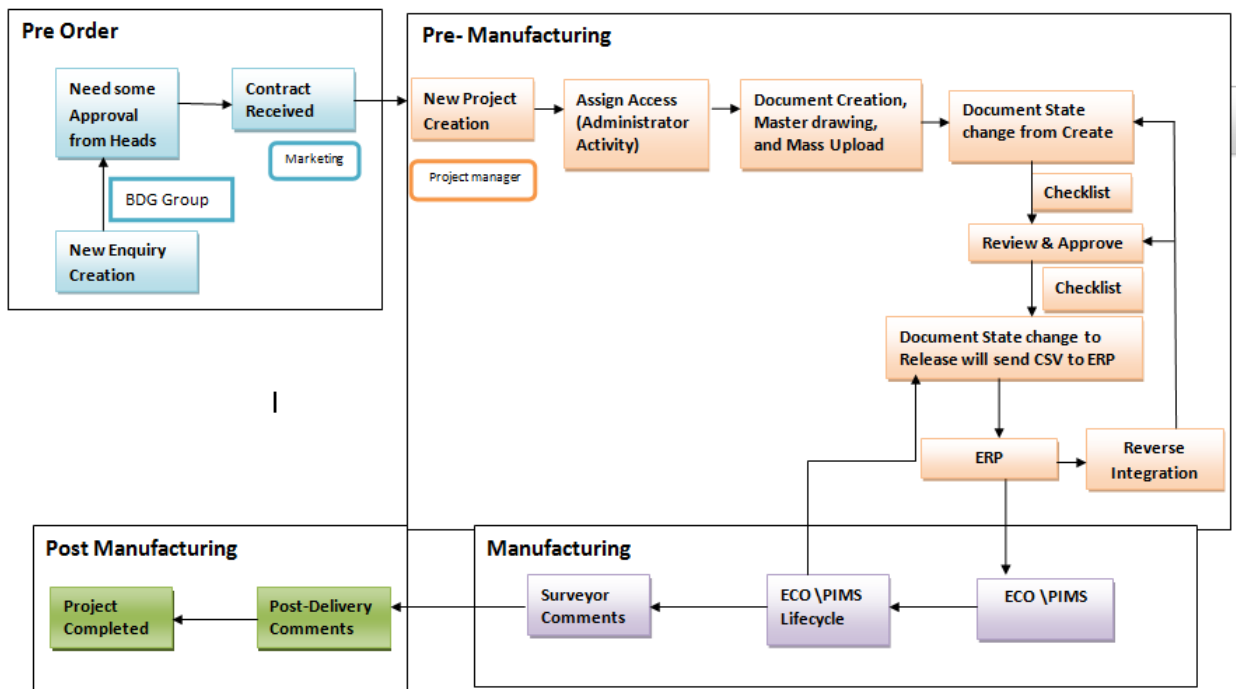
Each type of drawings is unique in nature and the correctness of the information to be checked also unique with respect to the drawing type. The check list portal developed in the vault ensures the drawings are checked based on the checklist before the release of the drawings.

Dashboard developed in the Vault provides the real time status of the drawing release.

Integration with Enterprise Systems

Interfacing the Vault with the Design Software and ERP (Infor LN) provides seamless data flow to the respective department users and execution of smooth Business Process. The data generated in the design floor plays a vital role in operationalizing the Business Process. The Interface between 3D Model design software and Vault enabled real time flow of information's like Drawings, BOM, SOTR etc to Vault. This information's flow to vault as a CSV file contains details of BOM for procurement, activity wise BOM, Parts, and Drawing number. The information in each CSV files have a role to play in department business process, and the same is being pushed to ERP automatically.

System reads the information from the csv file and based on the details, ERP stores the information's in the relevant tables and fields which enables making Automation in the Business Process.



Automation in Procurement:

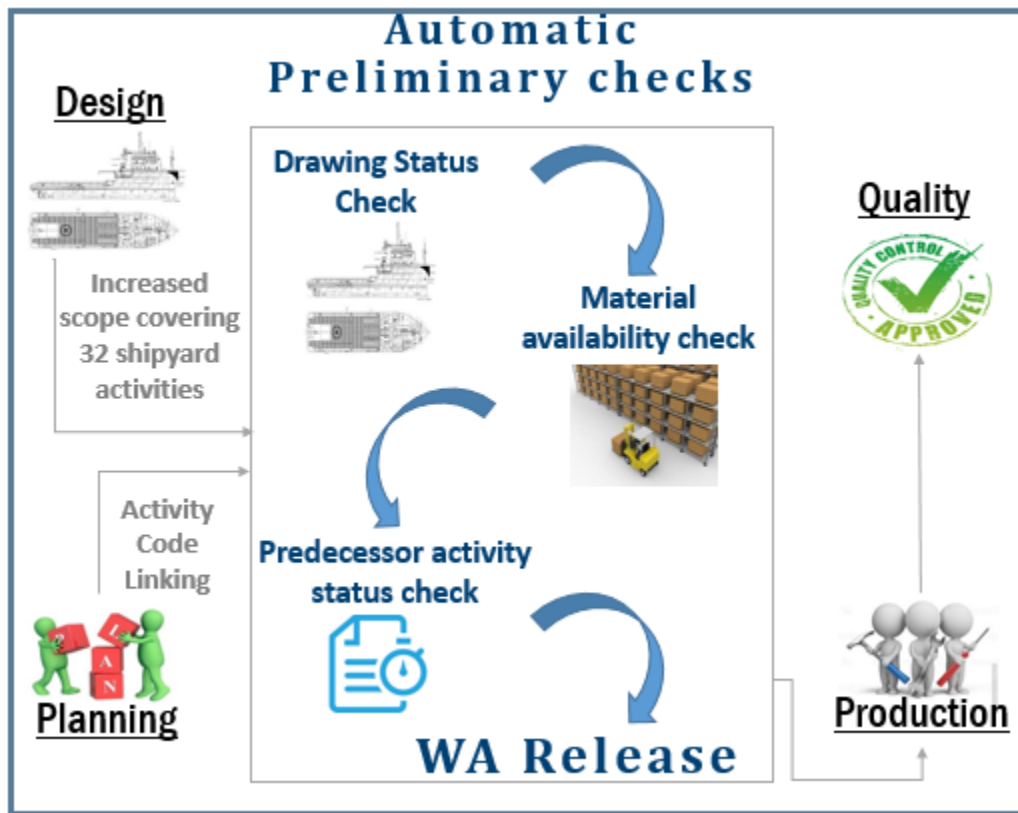
Logic built in ERP to identify the CSV files having information related to procurement of materials and system reads the information and check for the material availability in the warehouse. If the material is available it auto allocates the material for the respective project, else system generates an auto generated Purchase request to Supply chain group for Procurement of materials.

Automation in Planning / Production:

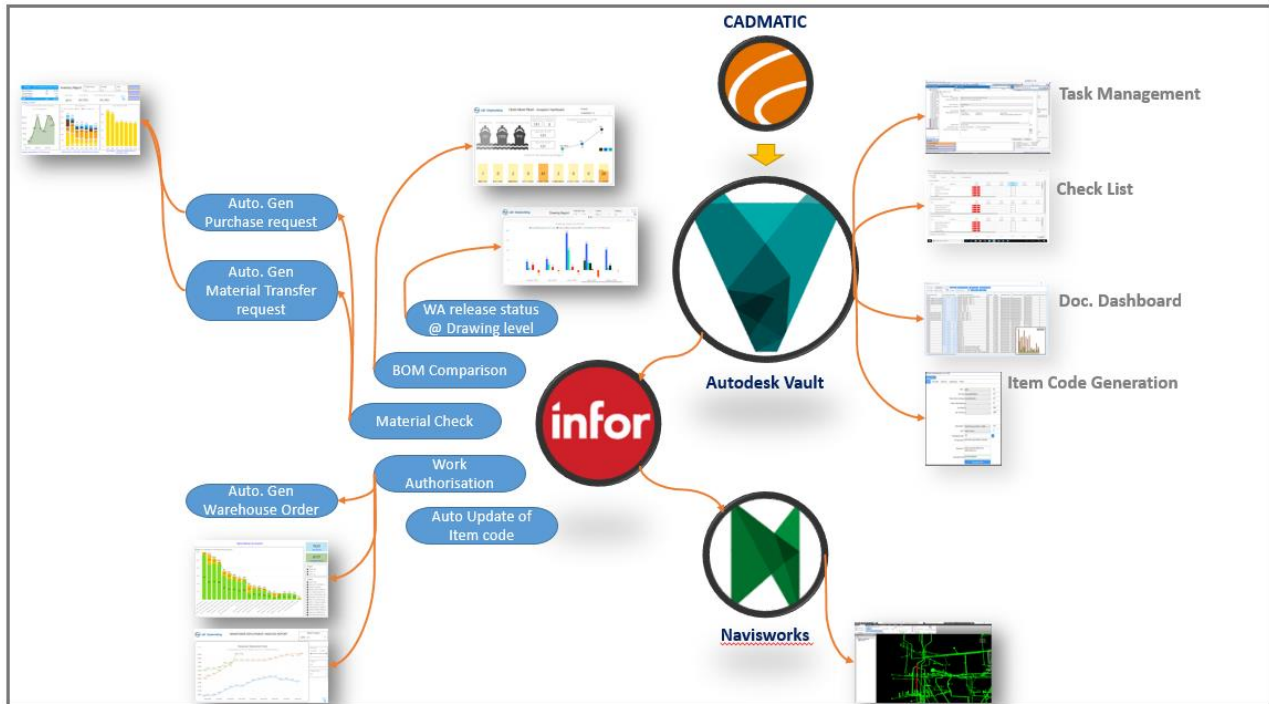
Ship construction is being a complex production process, identifying the correct material requirement for each activity and monitoring the production progress is being a challenging task. As traditional process, the drawings to be studied and the material requirement to be computed manually by planning which consumes 3 to 4 man days and probability for errors are higher due to the manual intervention. After extensive brainstorm sessions, decided to build an automation for linking the Activity and Element (BOM), which has resulted in automatic generation of warehouse orders in few minutes.

Interface created between MSP and ERP for the smooth flow of Project schedule to ERP. Listed down all the production activity which needs to be monitored and generated a new ID for each of the activity. Work break down structure (Element) has been created and the exact materials requirement information for each activity mapped against the WBS are read by the system based on the CSV files pushed to ERP from Vault.

Planning provides an Activity code for each activity listed in the MSP schedule and the same is updated in ERP. A Work Authorization is being generated by ERP post updation of the activity code and based on the logic build in ERP, system checks the drawing release status, availability of the material and completion of predecessor activity.



Each activity progress is being monitored and tracked by the Work authorisation closure status and real time dashboards developed for ready reference. WA release status is pushed to PDM vault, which helps design team to know the drawings which are in the production line. This input also enables design to take any decision if there is need of modification in the drawing.

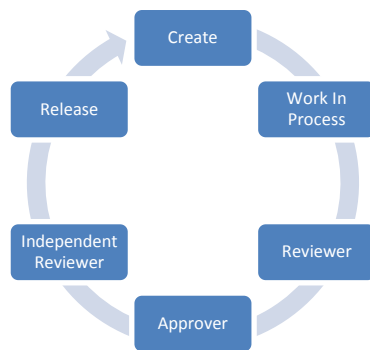


The Real time Dashboards provides information of Drawing release status, BOM comparison, Inventory status, Production progress etc..



Workflow– Flow diagram

Let's look at a simple example of advanced technology.



Our Workflow integrated with Autodesk Vault

The peripheral systems connected to Vault

Vault Professional Integration ERP offers the basis for the intelligent exchange of development relevant documents, material masters and bill of materials between Autodesk® Vault Professional 2018 and ERP

- Identical item- or material numbers and descriptions.
- Continuously available current drawings, models and previews for other departments
- Consistent release procedures for the product development processes throughout the company
- User comfortably operate SAP PLM functions directly from the Vault Professional 2018 main or context menu
- Practical, highly configurable toolboxes for simple handling
- SAP object generation / linking live or as a job processor job possible
- Visualization of SAP data in offline mode.

Business Benefits

Time:

- Reduce Design Time by Up To 40%

Cost

- License cost cheap and best compare to other PLM
- Elimination of Costly Errors on Factory Floor

Quality

- The main benefits of Autodesk Vault are providing better work transparency, empowering design processes, and improving work monitoring.

Business Efficiency

- Safely manage design data in one central location
- Speed up the design process with product data management (PDM)

- Find Data Quickly
- Rapidly Copy and Reuse Data
- Control Design Data Access with Revision Management
- Share Data Outside of the Design Group
- Scalability for Multiple Sites and Large Workgroups
- Automated Release and Change Processes
- Coexist and Exchange Data with Enterprise Business Systems
- Engineers and non-engineers can help review and markup designs inside of Vault
- Product release is also better handled with revision management and lifecycle states. It is always clear whether a design is WIP, Released, or being Reviewed – and you always know whether you are using the right version of the design.ult which makes it easy for anyone to provide feedback.
- View the status of a project by running reports on files, folders, and change orders using built-in or custom templates.

Some questions that you can get answered by attending the class / Talk:

- Why not use a PLM or cloud PLM tool?
- What flexibility did Autodesk Vault offer over other PDM / PLM?
- Isn't extensive customization a burden while upgrading?
- What are the potential risks in using Vault as a system to drive business instead of ERP?
- What native functionality of vault were used as is and what was customize?