Moving to Web User Interface and SAP Product Lifecycle Management

James Hodgins, Business Process Lead, Cognex Corporation
Jody Derick, Manager, Capgemini
Session ID # ASUG83947
About the Speakers

James Hodgins
• Business Process Lead, Cognex
• Business background in Quality and Lean manufacturing, 14 years in Cognex
• Running 4 Marathons this year ✔ ✔ ??

Jody Derick
• Manager, Capgemini
• Over 20 years of experience implementing and supporting SAP
• Not running any Marathons, but will run a few 5Ks
Key Outcomes/Objectives

1. How we configured the go live system
2. Explain our frustration with the go live system and what we learned
3. Describe our short term improvements and long term plan
Agenda

1. Provide an overview of the PLM Web UI implementation
2. Walk through the evolution of PLM Web UI functionality improvements
3. Proposed transition to Product Structure Management (PSM)
The world’s leading provider of vision systems, software and industrial barcode readers used in manufacturing automation.

Cognex vision helps companies improve product quality, eliminate production errors, lower manufacturing costs, and exceed consumer expectations for high quality products at an affordable price. Typical applications for machine vision include detecting defects, monitoring production lines, guiding assembly robots, and tracking, sorting and identifying parts.

Cognex serves an international customer base from offices located throughout the Americas, Europe and Asia, and through a global network of integration and distribution partners. The company is headquartered close to Boston in Natick, Massachusetts, USA.

2018 employees 1500
2018 Revenue $806 million
A global leader in consulting, technology services and digital transformation, Capgemini is at the forefront of innovation to address the entire breadth of clients’ opportunities in the evolving world of cloud, digital and platforms. Building on its strong 50-year heritage and deep industry-specific expertise, Capgemini enables organizations to realize their business ambitions through an array of services from strategy to operations. Capgemini is driven by the conviction that the business value of technology comes from and through people. It is a multicultural company of 200,000 team members in over 40 countries. The Group reported 2016 global revenues of EUR 12.5 billion.

Learn more about us at
www.capgemini.com
SAP Implementation scope

SAP version 1610

Standard SAP streams
FTM - Finance to Manage
OTC - Order to Cash
DTS – Demand to Supply
PTP – Procure to Pay
STC – Service to Cash

Additional modules
PLM – Product Life cycle Management
GTS – Global Trade Solution
BI – Business Intelligence

Implementation team
Cognex – 22 : 6 Data, 4 Peoplesoft, 8 Business leads, 1 BI, 2 Infrastructure, 2 PMO (25 Superusers to support testing and training)

Capgemini - 22 : 7 Stream leads, 1 BI, 5 Data/Development, 3 PMO, 8 Remote support
Product Lifecycle Management at Cognex

• Cognex is Engineering driven: success is dependent on the ability to provide multiple innovative products to the market every year.
• Engineering focuses on developing new products and enhancing existing products through the product lifecycle.
• PLM is where we create/manage our new Materials, BOM and Documentation.
• Early lifecycle changes are tracked by revision and later lifecycle statuses are changed with an ECR.
• These critical objects are Change Controlled via the workflow process and approved with an Engineering “change” Record (ECR).

<table>
<thead>
<tr>
<th>Lifecycle Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Unreleased</td>
</tr>
<tr>
<td>20</td>
<td>In Design</td>
</tr>
<tr>
<td>30</td>
<td>New Production</td>
</tr>
<tr>
<td>40</td>
<td>Released to Manufacture</td>
</tr>
<tr>
<td>50</td>
<td>Not Intended For New Applications</td>
</tr>
<tr>
<td>60</td>
<td>Last Time Buy</td>
</tr>
<tr>
<td>70</td>
<td>Obsolete</td>
</tr>
<tr>
<td>80</td>
<td>Deprecated</td>
</tr>
</tbody>
</table>
Arena PLM went live 5 years ago. It supported the growth of the company from $400 to $806 million. It managed the following for **7 Engineering sites**, **2 Distribution sites**, **1 New products manufacturing site** and as well as many marketing and sales teams.

- New part/BOM creations
- Sourcing/approved manufacturers
- Document management
- Change control process
- Supplier collaboration (Arena Exchange)

Capgemini proposed the use of Change master and Material Master Data management as the replacement for Arena PLM. It became clear that these standard functions in SAP were not equivalent to what Arena provided and a better solution was required.

- Material master, Documents and Change master are separate.
- Material BOM’s and Materials are separate, BOM’s do not have redline.
- Core SAP workflow for change master too much for go live.

**Solution is PLM WEB UI.**
PLM design analogy

Is SAAS system so there is very little required to get the system built. The fire station is built by them and you get limited instructions to configure the system.

SAP PLM does not have instructions, you are given a box of bricks to build whatever you want, there are many configuration options. Having the knowledge of all the possible configurations is critical. Not many people understand all the possible options.
Summary of PLM Web UI Functionality

**Materials**
- Basic data and Classification views
- Revisions
- To support the HERS Material type in PLM Web UI, a custom development was required to support Internal Number Assignment, allowing the linking of multiple Manufacturer parts to a Material

**Material BOM**
- Group BOM maintained through PLM
- BOM Redlines

**Documents**
- Linked to Materials and other Documents
- Versions and Revisions
Summary of PLM Web UI Functionality

Engineering Record
- Status profile to track ECR creation, approval, and implementation
- Automatic generation of change master based on status
- Embedded workflow functionality with easy start of approval process
- Auto Global Process Route assignment
- Auto Status Determination using BRF+
- Approval or Rejection Decisions
- Send Email notifications

Global Process Route Templates
- Sequential and Parallel approval tasks
- Decisions defined for each approval task
- Approval Task assigned to a Position
- User ids assigned to the Position (in Organizational Management)

Functionality was implemented via configuration settings, without additional development effort
Arena and SAP Workflow

Key

W = Workflow process
M = Manual process

July '18 to Feb '19

10-ECO Inquiry (Initial)
20-ECO Submitted for Approval
30-ECO Approved
40-ECO In Process
50-ECO Completed

15-ECO Rework/Reject

10-ECO Cancelled
60-ECO Cancelled

20-ECO Submitted for Approval
30-ECO Approved
40-ECO In Process
50-ECO Completed

Open
Submit for Routing
Submit for Approval
Approved
Effective
Complete
Rejected
Cancelled
BAD

Functionality lost when moving to SAP

- Working revision used to take a copy of an object which is then redlined to describe the change and apply the change. {Only implemented for Material BOM redlining in SAP}
- Use excel template to list the changes that the requestor wants to make. This is also the instruction to Documentation control to follow when keying the change.
- Ability to prevent modifications to Objects that are on an Engineering Change Record (ECR). These should be locked until the ECR is completed or rejected.
- Manual request to engineers not to change objects on ECR’s. Not a reliable solution.
- No BOM upload tool.
- Capgemini had to create custom code to create an upload tool to allow Cognex to import BOM’s from ECAD into SAP/PLM.
- The Supplier collaboration tool for PLM/cFolders was removed from S4 Hana.
- Cognex created a BOM export to export a BOM with the relevant information out of SAP into an excel file that could be shared with suppliers. All Documents required will be put into a Zip file with the BOM to give the supplier all the information they require. Manual process to collect all the data required.
- Document revision not linked to material revisions.
- Modified configuration to show documents based on validity date. Dates have to match material validity.
UGLY

Functionality not in PLM but in SAP
- BOM compare – Moved T-code to PLM GUI after go-live.
- Multilevel where used. - Moved T-code to PLM GUI after go-live.
- Mass change

Manual implementation of changes after the ECR has been approved.
(All of these lead to extra processing time and increase the risk of error)
- BOM redlines need to be manually “Applied”
- Any change to a Material
- Any change to a Manufacturer
- Any change to a Document

Master Data
- Data must be maintained across Sales Orgs, Distribution and Plants. Extra headcount required to manage this.
- External data collection tool developed by Cognex to collect Master Data information.

GUI
- Since PLM is a broad platform there are a lot of redundant fields and data/options that are not required by Cognex. This confuses users and leads to errors.
- There is a lot of duplication on different screen and more than one was to view it. Display material and Object navigator for example.
- The Global process route names used by the ECR creator does not get stored or displayed after use.
Go-Live Experience

- Engineers did not like the GUI and felt that the system increased the time they spend in PLM by 30%. Many fields displayed were not required, very little error proofing build into the system, fields did not default standard values, many screens needed where one screen did all in Arena.
- The amount of time taken to process ECR’s from Doc Control review to approval to completion increased from an average of 10 days to a peak of 26 and average of 19 down to 12 after the workflow improvements.
- The Global process route used to send ECR for approval was no longer displayed once it was used. 40% of ECRs were rejected initially and users had to remember the process route they used when resubmitting. We have 253 global process routes.
- Auto Status Determination BRF+ was turned off due to incorrect Process Route creation which resulted in workflow errors and ECR’s requiring help from IT to restart the process.

- Users found that history and traceability to changes were not consistent or reliable. Documents (DIRs) were not linked to material revisions, changes to characteristics were not linked to revisions.
- In general the PLM experience was very negative and was escalated to CEO level. Extra resources were added: one Consultant with SAP PLM experience and one SAP PLM employee who was involved in the design of PLM WEB UI.
Improvements to PLM Web UI

• **GUI Improvements**
  - Unnecessary fields were hidden
  - Removed entries from the menu and added transactions
  - Default values were set for key fields

• **Engineering Record (ECR) Improvements**
  - Class Name and Cross Plant status was added to the ECR Material Object
  - ECR email revised to include the description of the ECR in the subject
  - Added a Display button to Workflow Inbox to prevent Executing the work item when wanting to view only
  - Activated Forward and Substitution functionality for workflow reviewers

• **System Structure**
  - Additional Engineering Record Status added to take advantage of processing built into standard BADI for preventing an object from being on more than one ECR at a time
Arena and SAP Workflow

Key

- **W** = Workflow process
- **M** = Manual process

Diagram:

- **July '18 to Feb '19**
  - 10-ECO Inquiry (Initial)
  - 20-ECO Submitted for Approval
  - 30-ECO Approved
  - 40-ECO In Process
  - 50-ECO Completed
  - 15-ECO Rework/Reject
  - 60-ECO Cancelled

- **Feb '19**
  - ECO Inquiry (Initial)
  - ECO Rework/Reject
  - ECO Submitted for Doc Control Approval
  - ECO Submitted for Approval
  - ECO Approved (Final Doc Control Approval)
  - ECO In Process
  - ECO Completed
  - ECO Cancelled
Improvements to PLM Web UI

- **Update to Approval Processing**
  - All status levels added to workflow approval
  - Automatic status determination re-activated
  - Visual Status Map added with current status highlighted
  - Process route determination via Classification
  - Global Process Route Template captured for automatic process route determination after a rejection
  - Rejection routing automatically to the ECR originator
  - As an administrator, ability to forward the ECR for approval at any step in the process route
  - Remove the background tasks from the Team Definition tab
  - Addition of a Process Route Log to see any workflow errors

Improvements were made through a combination of configuration settings and leveraging the BADI's available in PLM for custom development
The blocks that Cognex used.

* Black blocks are to be used in the next phase of our project to add PSM functionality.
What’s Next? – Use more PLM Lego block

Add the Product Structure Management (PSM) functionality to the PLM setup. PSM implementation will require master data conversion and configuration changes to remove functionality from PLM and the modification of custom programs to work with PSM.

**PSM**
- Engineering workspace
- Engineering Materials, BOM’s and Documents
- Multiple revisions controlled by status
- Full historical structure maintained and traceable
- Single screen navigation for the majority of function

**PLM**
- Manufacture workspace
- Engineering Record is required to move a material from PSM into PLM to make it available for general ERP use
- Remove the ability to “Create or Change” in PLM. All creation and change is in PSM
- Engineering Record management is still part of PLM
Product Structure Management

Change Product Structure: 821_5000_1

Product Structure:
- 821_5000_1
  - R01 - 5000000455
  - R02 - 5000000457
  - 371_1000_01
  - R01 - 5000000455
  - R02 - 5000000457
  - 371_2000_01
  - R01 - 5000000455
  - R02 - 5000000457
  - 371_3000_01
  - R01 - 5000000455
  - R02 - 5000000457
  - 371_4000_01
  - R01 - 5000000456

Position: 821_5000_1
- General Data
  - Assembly Phase
  - Revisions
  - Fill Attachments
  - Administrative Data
- Identification
  - Product Item: 821_5000_1
  - Item Name: 821_5000_1
  - Item Type: Assembly
  - Class: ZPLM_ALL_PRODUC
- Control Data
  - Required Component
  - Multiple Selection of Product Item Variants Allowed
- Header Data
  - Material: STDVAR
  - Plant: 16000006313
  - Usage: Engineering design
Take the Session Survey.

We want to hear from you! Be sure to complete the session evaluation on the SAPPHIRE NOW and ASUG Annual Conference mobile app.
Presentation Materials

Access the slides from 2019 ASUG Annual Conference here:

http://info.asug.com/2019-ac-slides
Q&A

For questions after this session, contact us at

James.Hodgins@Cognex.com and Jody.Derick@Capgemini.com
Let’s Be Social.

Stay connected. Share your SAP experiences anytime, anywhere.
Join the ASUG conversation on social media: @ASUG365 #ASUG
Appendix

Additional implementation details are provided for reference
Enhancements Activated

- Easy start of approval process
  (Logistics – General > PLM > Case Management > Set Status Administration > Create Status Profile)
  In the Status Profile definition, removing the Event for Case "In Process" added the Start Approval option

- Process Route and Team Definition BADI’s activated
  (Logistics – General > PLM > PLM Web User Interface > Objects in PLM Web UI > Process Route > Additional Settings)
Configuration

- Activities and Decisions defined for Process Route tasks
  (Logistics – General > PLM > PLM Web User Interface > Objects in PLM Web UI > Process Route > Define and Assign Decisions)

- Background services defined for changing ER status based on task in Process Route
  (Logistics – General > PLM > PLM Web User Interface > Objects in PLM Web UI > Process Route > Define Background Services)
BRF+ for Status Determination

- Defined BRF+ for Status Determination
  (Logistics – General > PLM > PLM Web User Interface > Objects in PLM Web UI > Engineering Record > Set Up Rule-Based Status Determination)
Manufacturer Part Number Enhancement

- In the SAP GUI, the HERS material type provides the field MARA-BMATN to link the manufacturers part with the material number.
- Within the PLM Web UI this field was missing.
- A standard message displays stating "cannot be saved because it must be enhanced".