

PTC® Live Global

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Automating Tools using Windchill and Creo to Support Design

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**Radiation effects and
high-energy density science**



**Design agency for
nonnuclear components**



Government owned, contractor operated



**Warhead
systems engineering
and integration**



**Support
for
ballistic
missile
defense**



Improving model quality by providing Creo Web-link application

12x Faster

70% Improvement - 1st round quality
approvals



Upper assemblies have quality
components to utilize.

Rework not required



Sandia's journey for designer automation



Drawing Model Quality (DMQ)

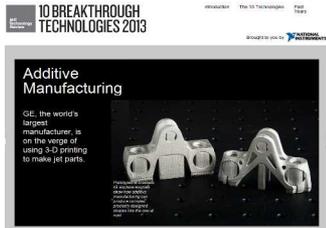


Software application to improve DMQ



Conclusion

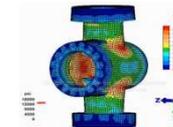
Models are Corporate Assets



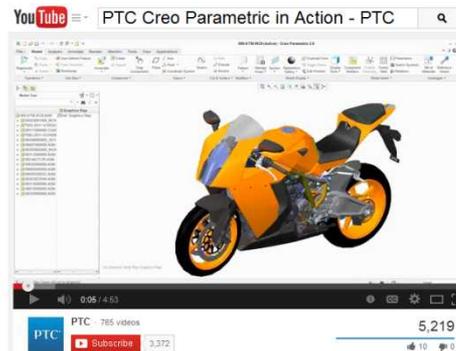
Bill-of-Materials

Part Name	Quantity	Unit Cost	Total Cost
Part 1	1	1000	1000
Part 2	2	500	1000
Part 3	1	1000	1000
Part 4	1	1000	1000
Part 5	1	1000	1000

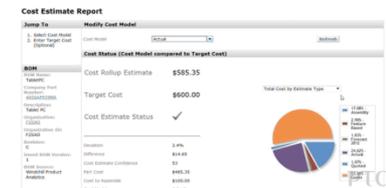
Analysis



Manufacturing



Cost Estimate Reports



Detailed Part Information

Property	Value
Company Name	PTC
Part Number	1000000000
Material	Aluminum

Change Mgt

Change Order	Reason	Status	Assignee
0001	Update CAD Design to support new design request	In Progress	Design Engineer
0002	Update ECD for any necessary based changes from keep out zones	Completed	Designer, PAK PCB
0004	Update Operation Manual with any changes to the design	Pending	MSD Technical Writer



Journey

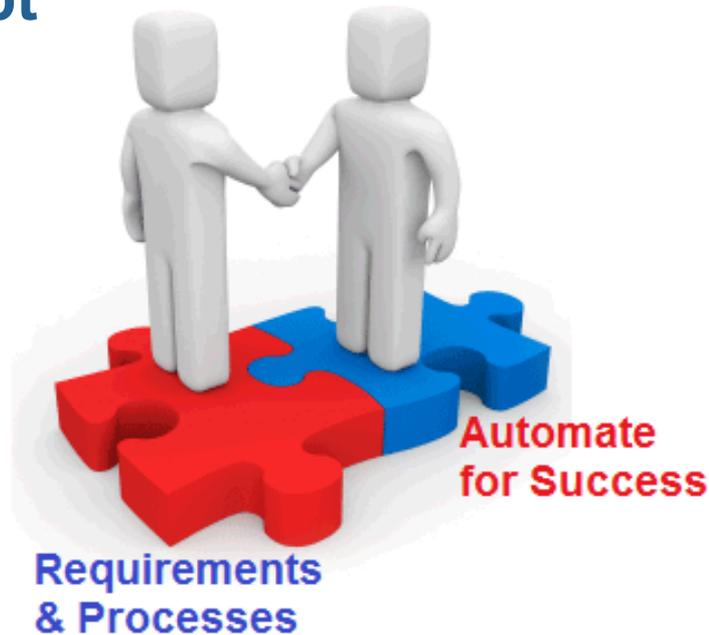
Journey started with 2 day event:

- **Listen to different points of view**
- **Gather data**
- **Group similar items**
- **Are existing processes effective?**
- **Establish root cause**
- **Select high impact**

Update Business Requirements and Processes

Updating Requirement and Processes could not interrupt design

Provide applications to minimize impact on Designers



Drawing Model Quality (DMQ) application utilizes Creo Web-link & Windchill Info Engine

Requirements:

- **Friendly interface**
- **Usable on new & legacy models**
- **Changes controlled by designers**
- **Modeling exceptions noted in CAD file**
- **Final report attached to native file**



DMQ Application Features:

Application tailors to model type

Required parameters only

Reviews and auto fix for:

Relations

Model Accuracy

Layers (most)

Suppressed

Verifies:

Material/Density

Dim Tolerance

Import Features

Reminders:

Missing Dependencies

Regeneration Indicator Light





Sandia National Laboratories
Exceptional service in the national interest

Sandia National Laboratories DMQ

CREO DRAWING AND MODEL QUALITY APPLICATION

MODEL QUALITY APPLICATION

Home | CAD Parameters | Report

Settings

Model Type

Model Drives Drawing Slaved Model Drawing

General Options

Manage Parameters Verify Model Accuracy* Resolve Layers
 Family Tables * Report Suppressed Feats* Report Dim TOL
 Verify Material/Density Report various references
 Verify NSE Relations* Remove COG features

Assembly Options

Report Inactive Components Report Assembly Cuts
 Report None Released Items Report Suppressed Components

Drawing Options

Report dims are not model driven Add all inst. to tabulated dwg.
 Report Revision matches Issue Verify tabulation note is included
 Remove Preliminary/Check Plot Stamps

CAD Model List

Current Workspace | Update | Display

MODEL QUALITY APPLICATION

Home | CAD Parameters | Report

Default Values | Retrieve Values | Input Values | Model Type: modeldriven

Select	Parameter Name	Default Value
<input checked="" type="checkbox"/>	AGENCY	SA
<input checked="" type="checkbox"/>	AML_NO	-
<input checked="" type="checkbox"/>	APPROVED	-
<input checked="" type="checkbox"/>	BOM_DESCRIPTION_ASM	DOOR INTERLOCK_TEM
<input checked="" type="checkbox"/>	BOM_DESCRIPTION_PRT	-
<input checked="" type="checkbox"/>	BOM_PART_NO	-
<input checked="" type="checkbox"/>	BOM_PART_TYPE	*1 = SNL manufactured part
<input checked="" type="checkbox"/>	BOM_QTY_TYPE	-
<input checked="" type="checkbox"/>	CAGEC	*14213 for SNL/NM (SA)

CAD Model List

Current Workspace | Update | Display

MODEL QUALITY APPLICATION

Home | CAD Parameters | **Report**

Add Row | Submit Fix | Create Final Report

Project Task Number

?	NSE Relations: <i>Number of NSE Relations not found: 1 of 2</i>	<input type="text"/>	<input type="checkbox"/>
😊	Model Accuracy: <i>Accuracy is correct</i>	<input type="text"/>	<input type="checkbox"/>
😊	Suppressed Features: <i>No Suppressed Features.</i>	<input type="text"/>	<input type="checkbox"/>
😊	Dimension Tolerance: <i>No issues found with tolerances</i>	<input type="text"/>	<input type="checkbox"/>
😐	Various References: <i>Not Tested</i>	<input type="text"/>	<input type="checkbox"/>
😊	Asm: Inactive Components: <i>No Inactive Components.</i>	<input type="text"/>	<input type="checkbox"/>

CAD Model List

Current Workspace Update Display

On our journey of improving model quality

Listened to our design community

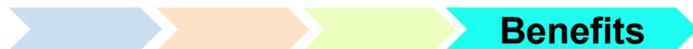


We reviewed and updated requirements

We tested and automated



We validated and verified



DMQ application is improving model quality

Designer self check
time reduced from

1:00 Hr.



:05 min.

Per
File

1st round
Quality approval rate



**Clear Results indicate
Creo Web-link application
is beneficial to Sandia designer's**

