

CYIENT



North Jersey
Section

The Global Voice of Quality™

Production Part Approval Process (PPAP)

What Software Does and Does Not Work & Why

Oct 20, 2021

Intended Audience

- You already know about PPAP
- You have experience trying to do PPAP with email and spreadsheets OR another big system that is annoying, cumbersome, and you want to go back to spreadsheets
- You may, or may not, require Supplier PPAP, but if you do, that is even more cumbersome

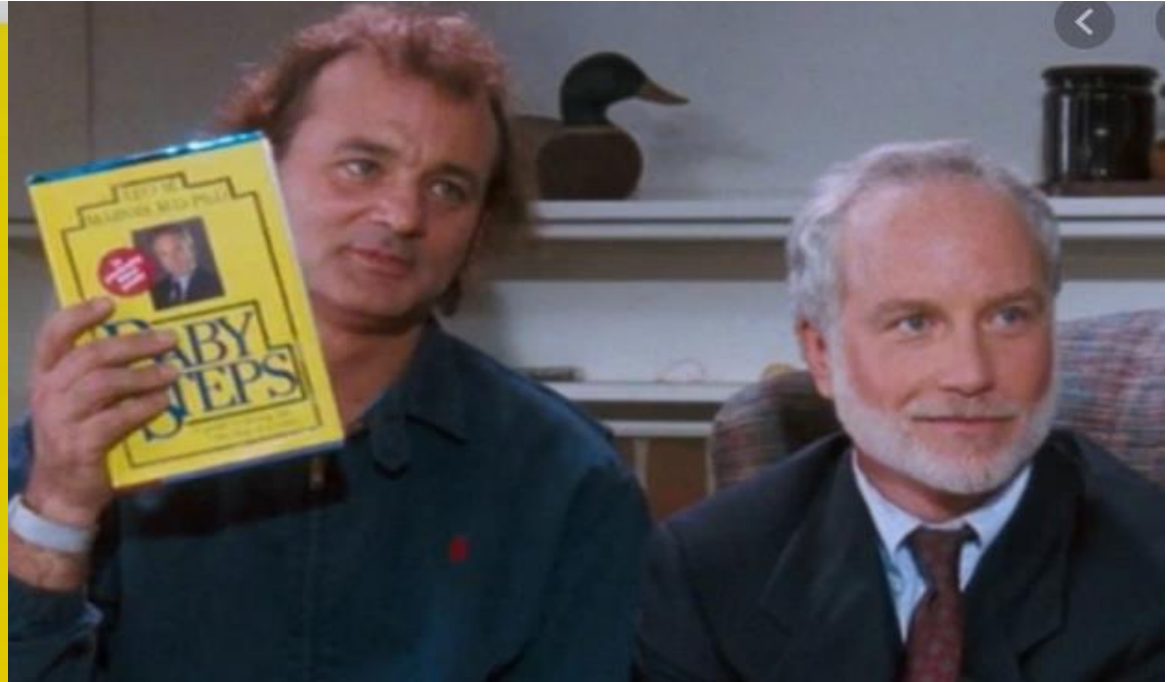
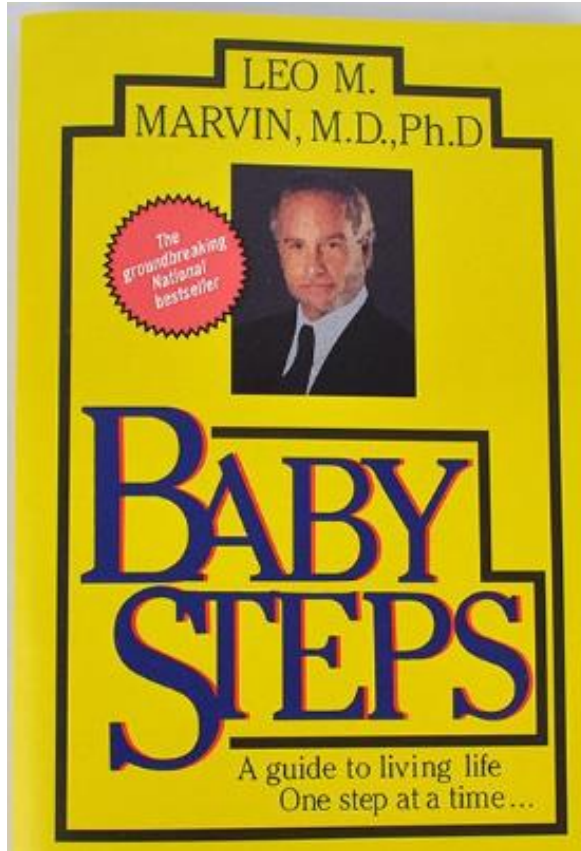


PPAP Versus FAI

- FAI verifies that you could make at least one good part
- PPAP evaluates your ability to consistently make conforming products, including:
 - The process you follow.
 - What risks are present?
 - How the risks are controlled.
 - The measurement system is capable of only accepting good parts and only rejecting bad parts.

PPAP	FAI
Design Records	Design Records
Engineering Change Documents	
D-FMEA	
Process Flow Diagram	
P-FMEA	
Control Plan	
Measurement Systems Analysis	
Dimensional Results (for N parts)	Dimensional Results (for 1 part)
Raw Material Records	Raw Material Records
Lab Results	Special Processing Records
Functional Test Records	Functional Test Records
Initial Sample Inspection Report	
Process Capability Study	
Appearance Approval Report	

Baby Steps



It means setting small, reasonable goals.
One day at a time, one tiny step at a time— do-able

Lean Principles Applied PPAP



Defects



Transportation



Over Production



Inventory



Wait



Process



Motion



SOURCE: <http://blog.ppapmanager.com/2018/11/21/lean-manufacturing-principles-applied-to-ppap-approval-process/>

Why Bother?

Build a knowledge base from PPAP and dramatically shorten time and improve results to minimize risk

- PPAP Creation Time – Reduce 60%
- PPAP Reporting / Submission time – Reduce 90%
- PPAP Effectiveness – Improve 80%



Why Do We Make Bad Decisions?

Without understanding what your people need, how the process works, the software will fail.



Why Do We Make Bad Decisions?

- Requirement's document
- Perfection versus improvement
- Who you ask drives needs and wants
 - Oversee
 - Manage
 - Execute



Voice Of The Customer (VOC)

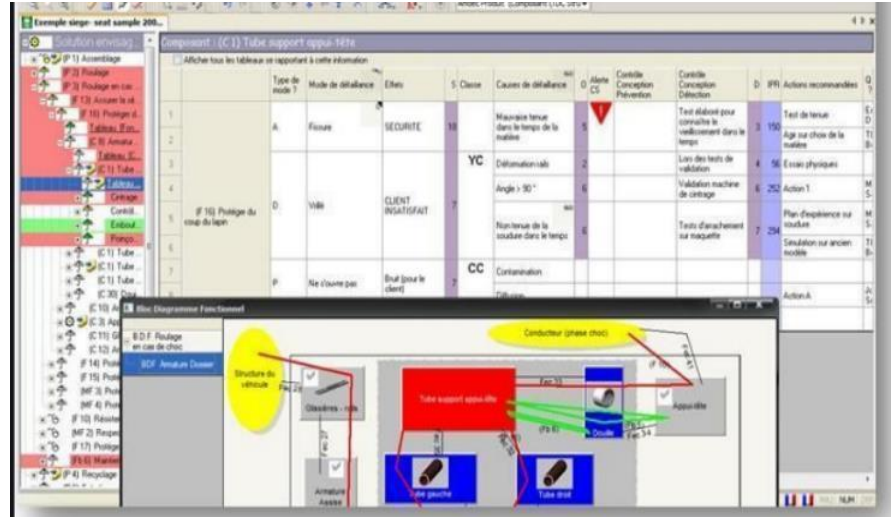
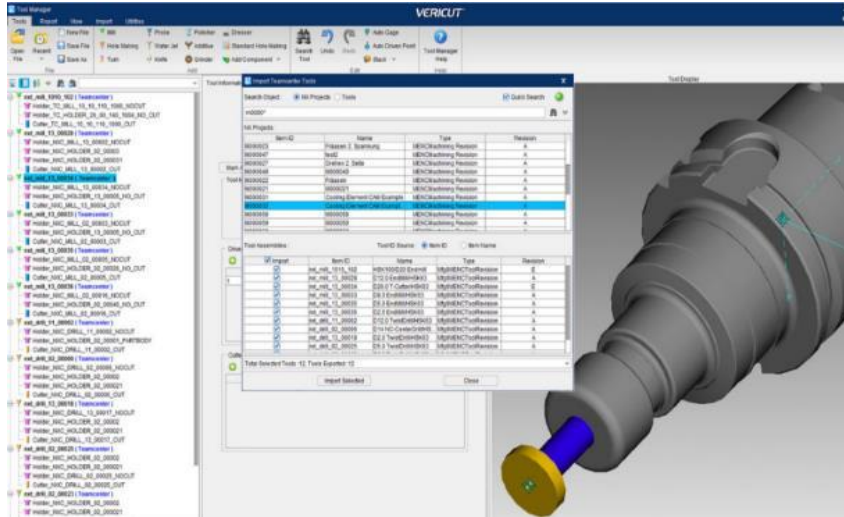


“If it is too complicated, I am going back to spreadsheets.”

“I am not trying to have the software do my job. I want it to make my job easier.”

“Don’t automatically do anything. Let me decide.”

Why Isn't My PLM Effective For Supplier PPAP?



“We spent over 5 years and \$5M trying to get three different PLM apps launched for PPAP and they all failed. It wasn't until I heard this presentation that I understood why.”

Very Rigid, on Purpose

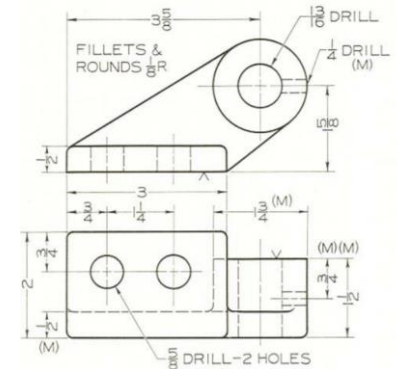
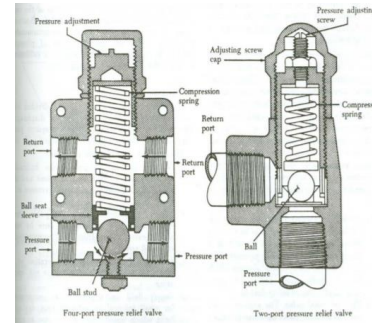
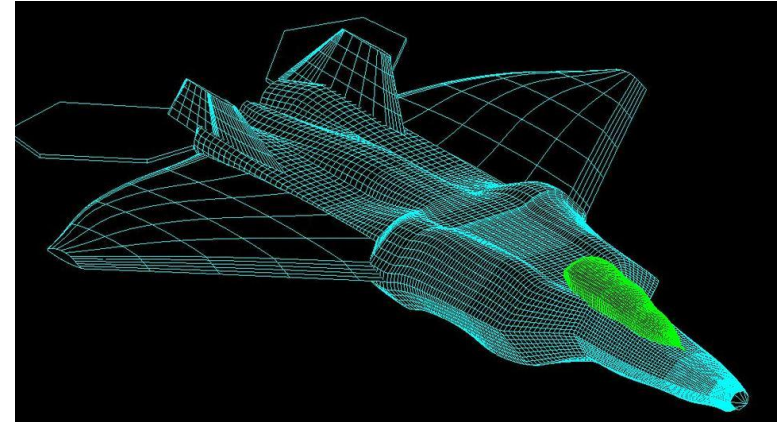
User Roles Are Very, Very Different

- **Designing Systems**

- Focus is on potential design failures and their causes.
- Requires highly engineering tools

- **Making Parts**

- Focuses is on potential process failures and their causes.
- Over 80% use spreadsheets



Software DFMEA To PFMEA? No!

Function	Failure mode	Cause	Effect	Severity
Friction torque <·Y	Friction torque >·Y	Worst-case stack-up of inner ring diameter, inner ring roundness (YS), outer ring diameter and outer ring roundness and ball diameter	Increase power use	5

Function	Failure mode	Effect	Severity
Inner ring roundness <·X	Inner ring roundness >·X	Friction torque >·Y resulting in increased power use	5

Design Related Failures



Process Failures

People DFMEA To PFMEA? Yes!



Supplier Portals And Project Management Software

Simply uploading spreadsheets is a risk!

Project Management (80/20)

Missed a Deadline - Bummer

vs.

Document Authoring (20/80)

Process Flow, PFMEA, Control
Plan, Gage Study, etc.

Product Recall - \$\$\$\$



Simply Uploading Spreadsheets Is A Risk

12 of the Biggest Spreadsheet Fails in History | Oracle SMB Blog

Oct 21, 2019 - Bad math, transposition **errors**, and “fat finger” **errors** run rampant in companies of all sizes. **Almost 90 percent of all spreadsheets have errors.** Even the most carefully developed, tried, and tested **spreadsheets** have **errors** in 1 percent of all formula cells.

**One industry certification oversight body reported
400 major and 6,000 minor audit findings on control plans**

Organisations 'alarmingly' unprepared for spreadsheet risk ...

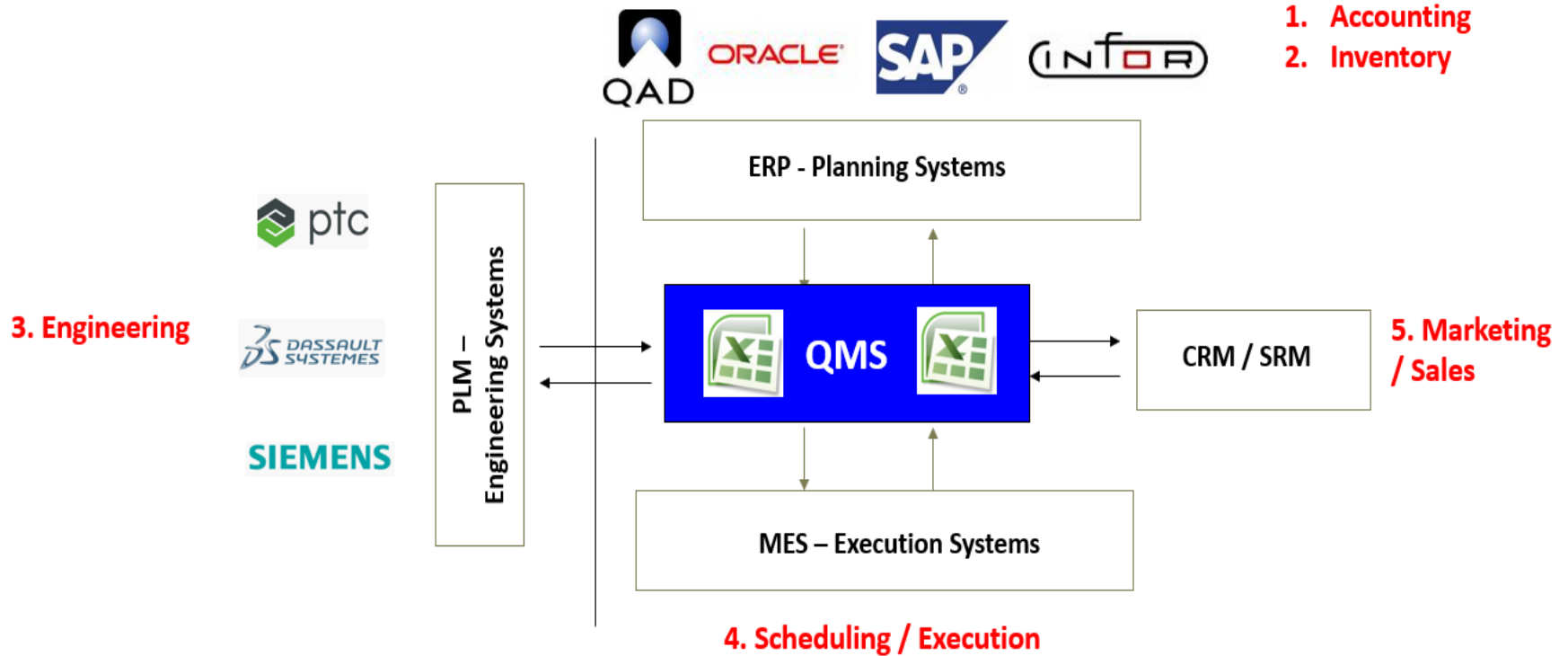
Apr 11, 2019 - For corporates, large and small, **spreadsheet** risk management is primarily an exercise ... scanning and securing all **business-critical** data in one simple **process**.

Challenges

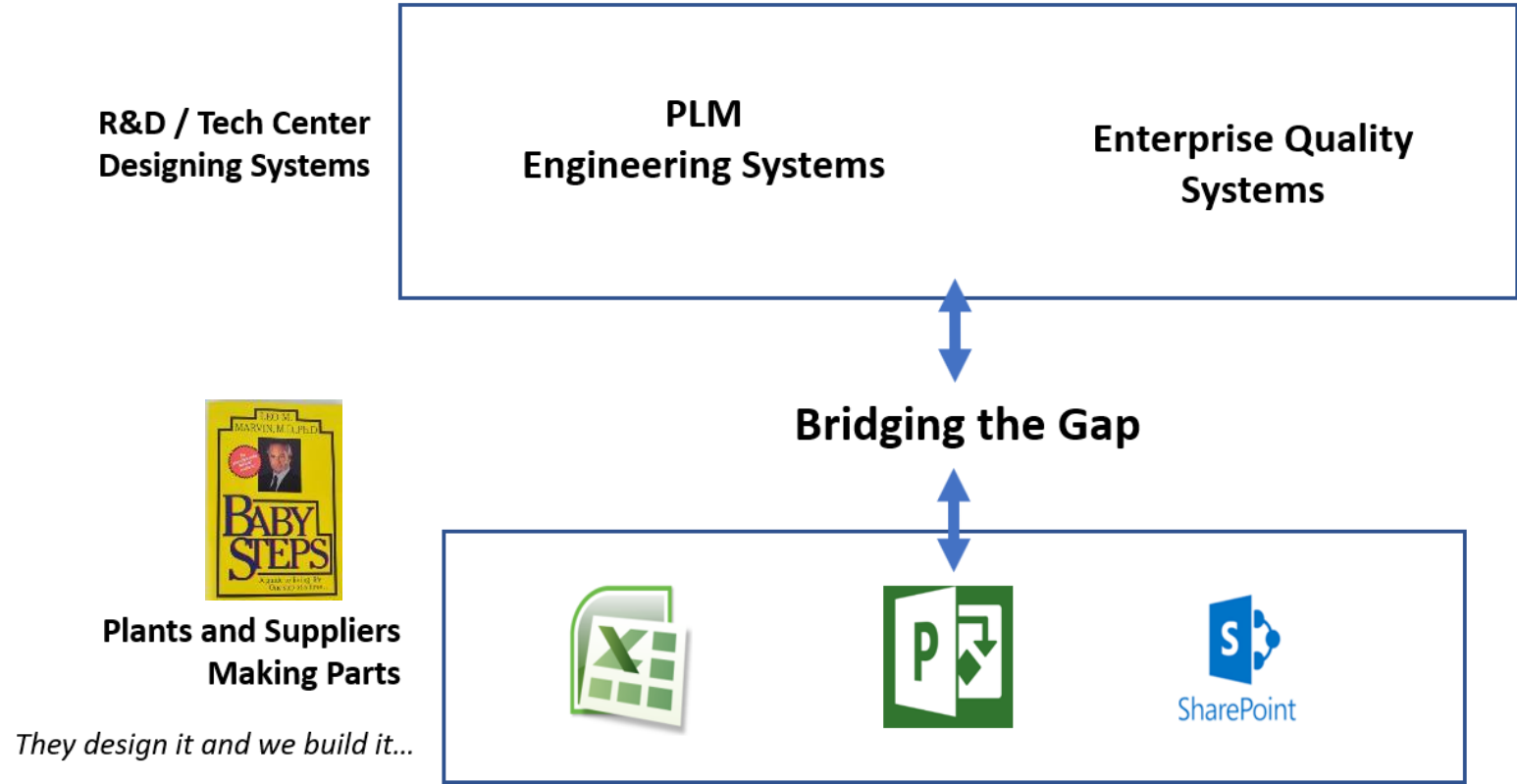
- Is this an ERP, PLM, or QMS issue?
- Didn't we already buy an app or this?
- We make parts, we do not design them
- Better than spreadsheets, but not complex!



Manufacturing Software Map



Engineering/Quality Software Map



What Works Depends On Who You Are



System
View



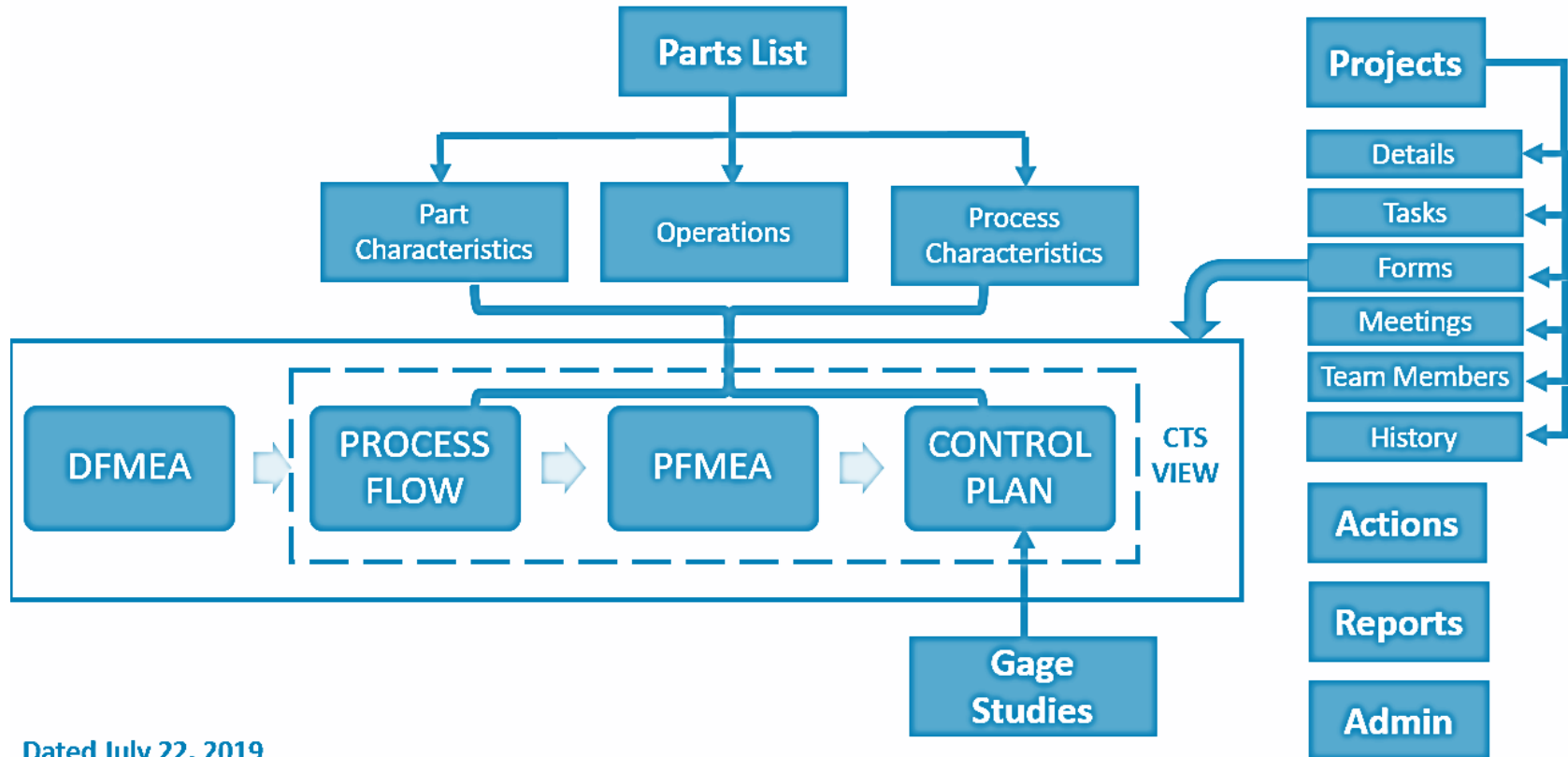
Part
View



PLM

Spreadsheets

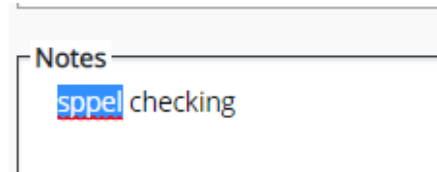
Better Than Spreadsheets, But Not Complex?



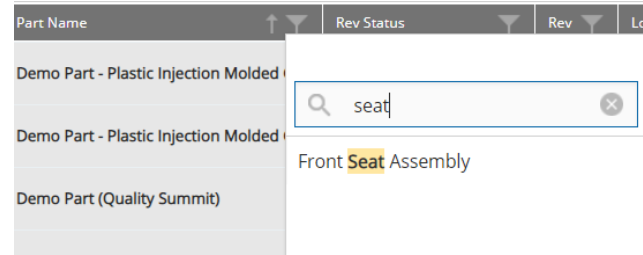
Dated July 22, 2019

Like Spreadsheets, But Better

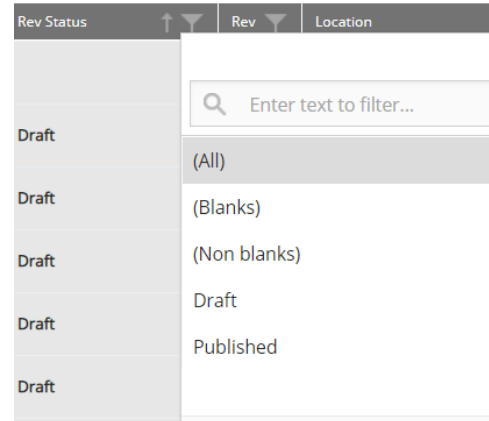
Spell Checking



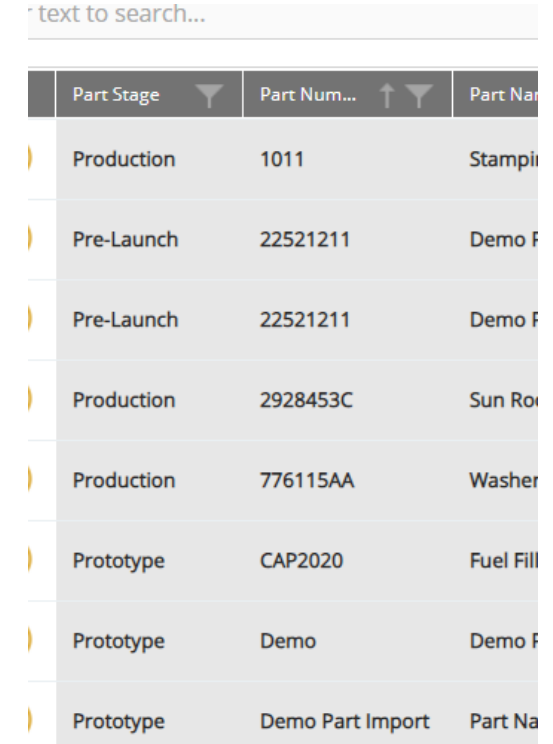
Smart Search's



Row Filtering



Column Sorting



Like Spreadsheets, But Better

Form Feature to Pin Columns

The screenshot shows a software interface with a navigation bar at the top containing tabs for 'CTS VIEW', 'PROCESS FLOW', 'PFMEA', 'CONTROL PLAN', and 'DFMEA'. To the right of these tabs is a 'Use Template:' dropdown menu set to 'AIAG & VDA PFMEA Form C (Standard)', along with search, refresh, and 'ACTIONS (2)' buttons. Below the navigation bar is a table with a header row and several data rows. The header row is divided into two sections, both labeled 'Structure Analysis (Step 2)'. The first section contains three columns: '1. Process Item :: System, Subsystem, Part Element or Name of Process', '2. Process Step :: Name of Focus Element', and '2a. Process Step :: Station Number'. The second section contains three columns: '3a. Process Work Element :: 4M Type', '3b. Process Work Element :: Description', and '1a. Function of the Process Item :: Your Plant'. Below these are columns '1b. Function of the Process Item :: Ship to Plant' and '1c. Function of the Process Item :: End User'. A blue callout box with white text explains the pin columns feature, pointing to a pin icon in the first column header. The data rows include 'Door Panel Support Manufacturing', 'Punching', 'Verification', and '30', '40'. The bottom of the interface shows 'Pages: 1 - 1 (7 items)' and 'Page size: All'.

The pin columns feature allows a user to temporarily freeze a specific column(s) in place while freely scrolling through the rest of the form. This feature is like the “freeze panes” option available in spreadsheet applications and is available when viewing and editing forms in CTS.

Like Spreadsheets, But Better

Form Feature to Hide Columns

CTS VIEW PROCESS FLOW PFMEA CONTROL PLAN DFMEA Use Template: AIAG & VDA PFMEA Form C (Standard) ACTIONS (2)

Structure Analysis (Step 2)		Structure Analysis (Step 2)			Structure Analysis (Step 2)		
1. Process Item :: System, Subsystem, Part Element or Name of Process	2b. Process Step :: Name of Focus Element	2a. Process Step :: Station Number	3a. Process Work Element :: 4M Type	3b. Process Work Element :: Description	1a. Function of the Process Item :: Your Plant	1b. Function of the Process Item :: Ship to Plant	1c. Function of the Process Item :: End User
Door Panel Support Manufacturing	Punching	30	Machine	Tooling	Stamp Door Panel Support	Assembly of Vehicle door	Provide the attachment point of the door panel to the door
			Machine	Press Machine			
	Verification	40					

Pages: 1 - 1 (7 items) Page size: All

The hide column feature allows a user to temporarily hide columns for the purpose of bringing relevant information into view to reference during data entry, reducing the need to scroll back and forth across the form.

Like Spreadsheets, But Better

FMEA Action Items

The screenshot displays a software interface for managing FMEA (Failure Mode and Effects Analysis) action items. The interface includes a navigation bar with tabs for Home, Parts, Projects, Gage Studies, and Actions. Below this, there are sub-tabs for Details, Tasks, Forms, Meetings, Team Members, and History. The main content area shows a table with the following columns: Process Step, Operation Desc./Func., Requirements, Potential Failure Mode, and Potential Effect of Failure. A callout box with the text "Brings the right side of the FMEA to life!" and a blue arrow points to a list of action items on the right side of the table.

Process Step	Operation Desc./Func.	Requirements	Potential Failure Mode	Potential Effect of Failure
20	Attach seat cushion to track using a torque gun (air pressure)	Correct screw torque	Screw torqued too low.	End User: Loose seat cushion due to gradual loosening of screw and noise.

Brings the right side of the FMEA to life!

MY (3) **ALL (3)** **SHOW COMPLETED (0)**

- PFMEA : Recommended Actions 2019-12-06
- PFMEA : Recommended Actions 2019-09-26
- DFMEA : [No Action Specified] [No Date]

Like Spreadsheets, But Better

Consolidated View and Configurable Forms

Details | Tasks | Forms | Meetings | Team Members | History

CTS VIEW | PROCESS FLOW | PFMEA | CONTROL PLAN | DFMEA

Use Template: AIAG & VDA PFMEA Form C (Standard)

Row Visibility		Operations					Characteristics					Control Methods
Process Flow	PFMEA	Control Plan	Process Step			Operation Desc./Func.	Product Characteristic Item	Product Characteristic Description	Process Characteristic Item	Process Characteristic Description	Specification / Tolerance	Control Methods
			Fabri	Inspe	Move							
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	30	◆		Assembly of Brake Pad Shims	RL001	Quantity of Screws		4 screws	=UNICHAR(8711)	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		◆			RL003	Test		Test		
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	70		■	Support Plate riveting	30	Alignment between brake shim and brake pad back				
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	30	◆			RL002	Screw Torque		41 ± 1 lb-ft	=UNICHAR(8711)	

Continuity test & in line look

Like Spreadsheets, But Better

Freeze Versions

Releases:
Do you want to tag this update as Release?
This mainly affects the history timeline, which would show this save as a point-in-time that can be reviewed.

Do Not Mark As Release
 Mark As Release

As of:
20 September 2019

Labelled:
[Empty field]

Update Notes (optional):
[Empty text area]

Provide a short description/reason for the changes, for the benefit of other users and to provide more clarity for the history lookups.

Row Visibility	Process Flow	PFMEA	Control Plan	Process Step	Operation Type	
[+]	[+]	[+]	[+]	30	◆ Fabrication	Pund
[+]	[+]	[+]	[+]	30	◆ Fabrication	Pund
[+]	[+]	[+]	[+]	30	◆ Fabrication	Pund
[+]	[+]	[+]	[+]	30	◆ Fabrication	Pund

Provides you with the ability to store a snapshot of Forms documents for archiving purposes (CTS View, Process Flow, PFMEA, Control Plan, and DFMEA).

Who Needs To Manage The Risk?



Legal
Protect the
company



Marketing
Protect the
brand



Finance
Reduce
failure costs



Engineering
Provide the
data



Quality
compliance
and
continuous
improvement



Purchasing
Define the
supplier
expectations



Operations
provide input
and performance
data

Supplier PPAP Benefits To You

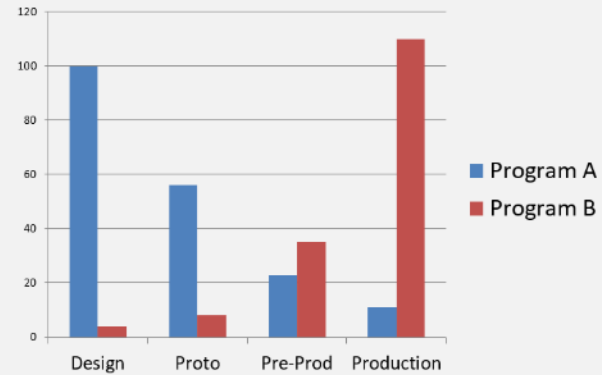
- Establishing confidence in suppliers and their production processes
- Allows companies to avoid the use of unapproved parts from the production line
- Makes it easier to detect issues or defects early in the production process, inevitably reducing time and saving costs



Supplier PPAP Objectives

- Hold the Supplier responsible for their ability to produce parts that meet specifications
- Assure PPAP reviews are actual reviews

Number of Engineering Changes by Product Stage



INCREASE
PROFIT ON
NEW PRODUCTS



Workflow Needed? - No

Publish Project



- Demo Project (Quality Summit)
- Process Flow Diagram
- Process Failure Modes and Effects Analysis (PFMEA)
- Control Plan
- Measurement System Analysis (MSA)
- Dimensional Results
- Material / Performance Test Results
- Initial Process Studies
- Qualified Laboratory Documentation
- Appearance Approval Report (AAR)
- Sample Production Parts
- Master Sample
- Checking Aids
- Customer-Specific Requirements

Today (1)

Project - Demo Project (Quality Summit)

Project - Demo Project (Quality Summit)

Name

Task - Process Flow ...

ProjectSummaryRe...

Name

GageStudiesReport_GRR

PartSubmissionWarrant

Project Report

Project Details:

Project Name:	Demo Project (Quality Summit)
Status:	Active
Type:	PPAP
Part / Revision:	DEMO-QS (Demo Part (Quality Summit)) / A

Stuff Assigned To Me...

Home | Parts | Projects | Gage Studies |  Actions



Tasks that are assigned to you:

Name	Priority	Start Date	End Date	Completion (%)
Process Flow Diagram		9/9/2019	11/15/2019	0
Measurement System Analysis (MSA)		11/15/2019	12/17/2019	0

CTS (PFMEA / DFMEA) Tasks that are assigned to you:

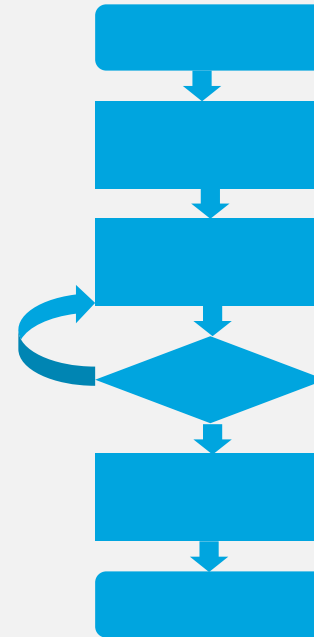
Project Name	Type	Target Completion	Status
__APQP Demo Project - Seat Assembly	DFMEA		
__APQP Demo Project - Seat Assembly	PFMEA	12/6/2019	Open
__APQP Demo Project - Seat Assembly	PFMEA	9/26/2019	Decision Pen...

Projects that you are part of:

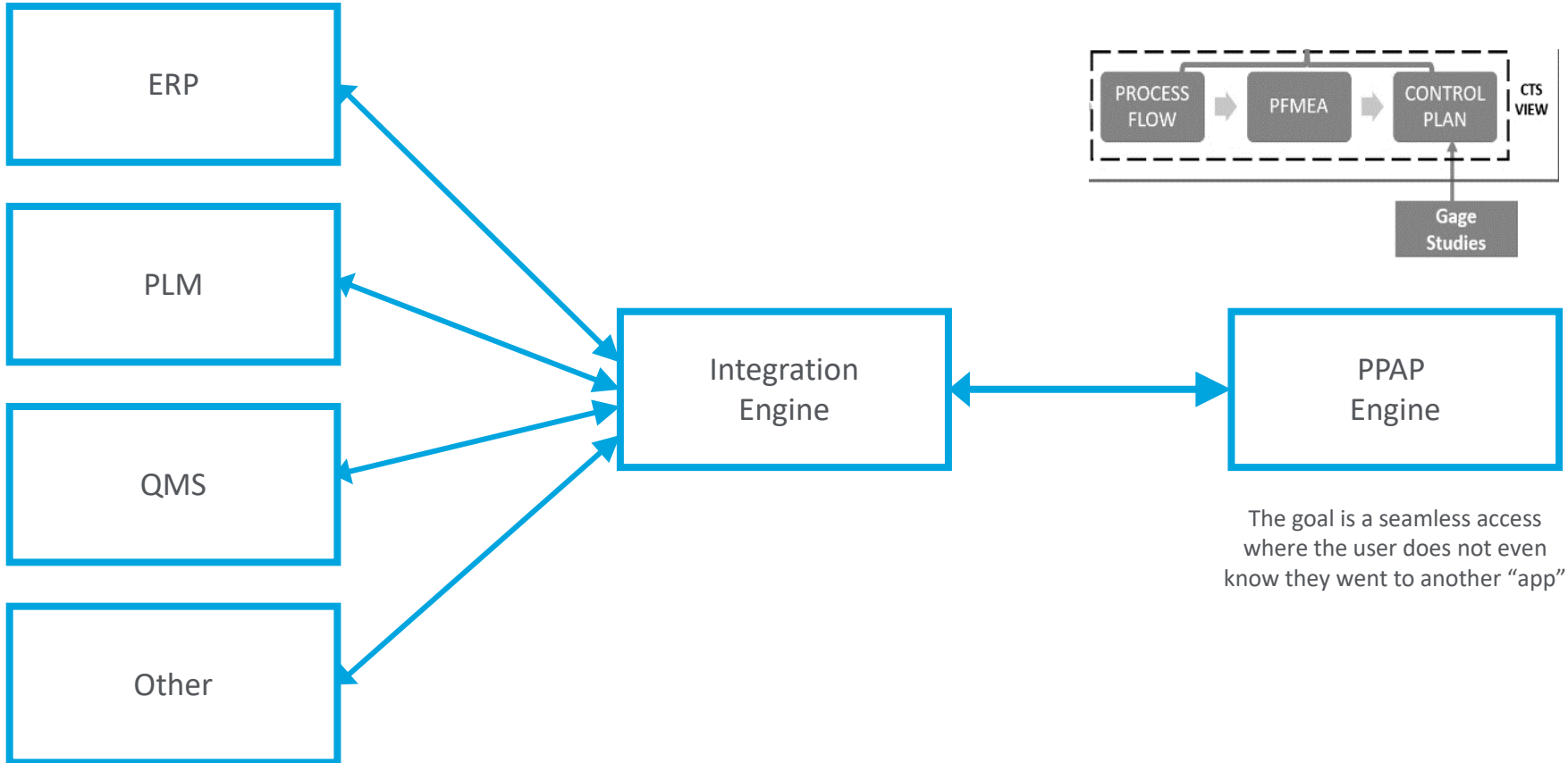
Name	Type	Part Number	Revision	Location	Due Date
AMEF de Diseño Familia 1	APQP	M2228 (TPO)	3	Mexico	10/10/2019
__Demo Project (Quality S...	PPAP	DEMO-QS (Demo Part (Qua...	1	Minneapolis - ...	1/31/2020
CAP2020	PPAP	CAP2020 (Fuel Filler Cap)	A	Minneapolis - ...	
DP2019	PPAP	DP2019 (Door Panel)	A	Minneapolis - ...	1/10/2020

Supplier PPAP Process Flow

- Purchase Order Drives PPAP Request – Part Number / Revision Level Driven
- Engineering Provides Part Data – with Product Characteristics & DFMEA
- Supplier Completes PPAP process and submits paperwork / forms
- Supplier Document Review (full, partial, re-submit)

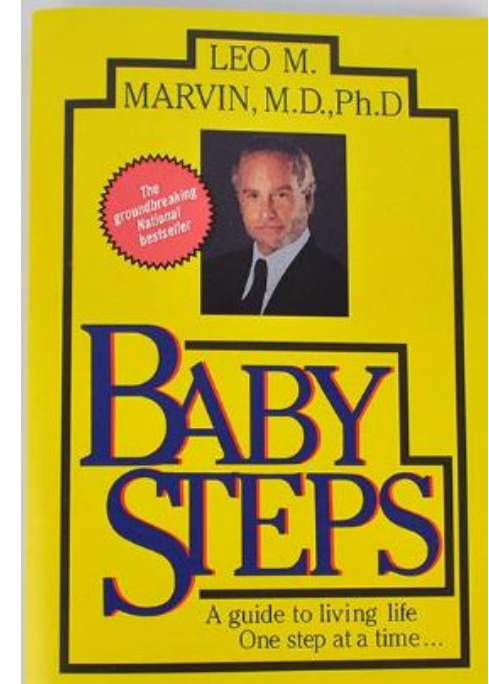
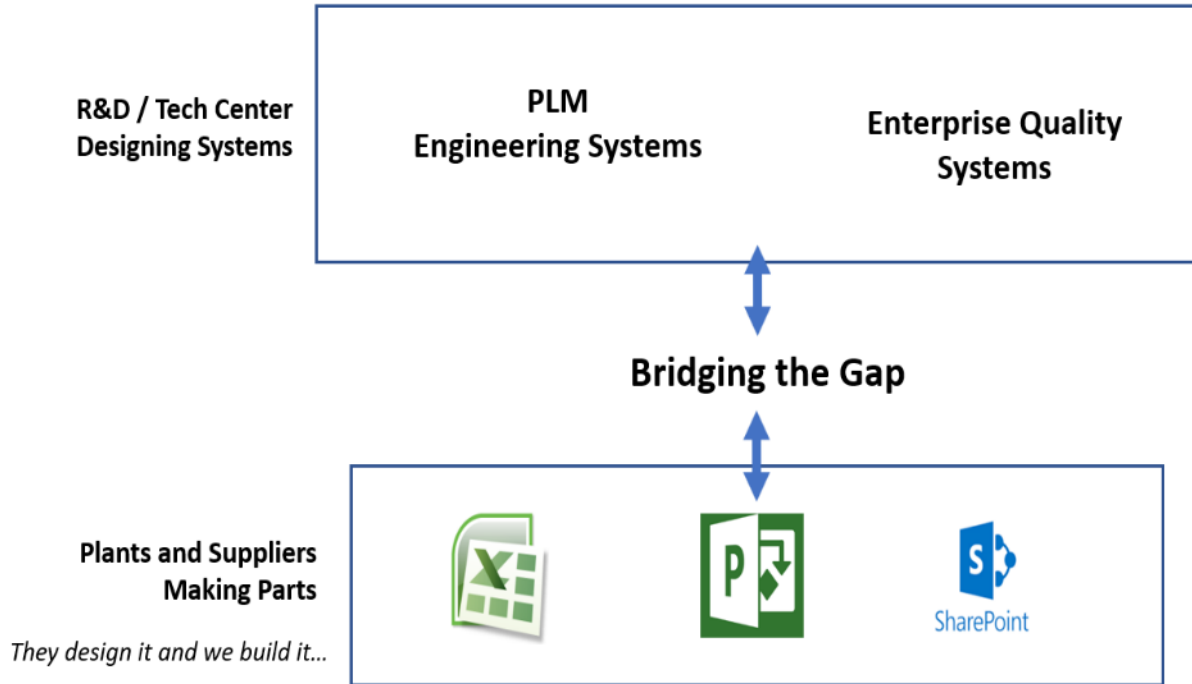


PPAP Engine For Document Authoring



The goal is a seamless access where the user does not even know they went to another “app”

Recommended Solution




Reporting And Analytics Capability

- What are the Top 10 issues
- Are the actions on the top 10 issues adequate?
- Are we getting better? Worse?
- What do I have to work on, by Due dates?
- RPN Analysis



How to Get Your Project Funded

- Get Finance / Accounting involved – focus on failure costs
- Ask Operations about delays from shipping due to PPAP not approved
- Get Engineering to engage with NPI on purchased parts with Purchasing
- Lean applies to the PPAP process



You've Got Funding!

Recommended Solution

- Solve the document authoring problems
- Database Driven
- Improved security & audit trail
- Reporting and Analytics capability not possible with spreadsheets



Speaker Information



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Q&A



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