

Digital Workflows
for
New Product Introduction (NPI) Excellence
Sep 15, 2022



Agenda

- Brief Intro
- Real world application of workflow-driven NPI/PLM
- Process Orchestration for NPI Excellence
- Workflow-driven approach to NPI/Sustaining Engineering
- Component Engineering
- Supply Chain as an integral part of NPI Process
- Q&A

About Cambrian Lab

Mission: To Provide Effective and Practical Solutions for Supply Chain Excellence

Team

Supply Chain, New Product Introduction, and Technology Experts from SAP, Samsung, Siemens, GM, Ford, Applied Materials

Industries

Automotive, High-tech, Semiconductor Equipment, Medical Devices, Consumer Products
(From Fortune 100 to Start-ups)

Locations

SF Bay Area, Detroit, Boston, Houston

Expertise

- New Product Introduction, Supplier Development and Quality Management
- Enterprise and Supply Chain Technology (ERP, SCM, Manufacturing, CRM, Sourcing, Finance)



Panelists

Elisabeth Fisher

Smart Global Holdings / Penguin Edge

Kris Gorrepati

Cambrian Lab

Manish Mathur

Cambrian Lab



Modern New Product Introduction (NPI) Challenges



Even simple products are increasingly complex, connected and intelligent systems

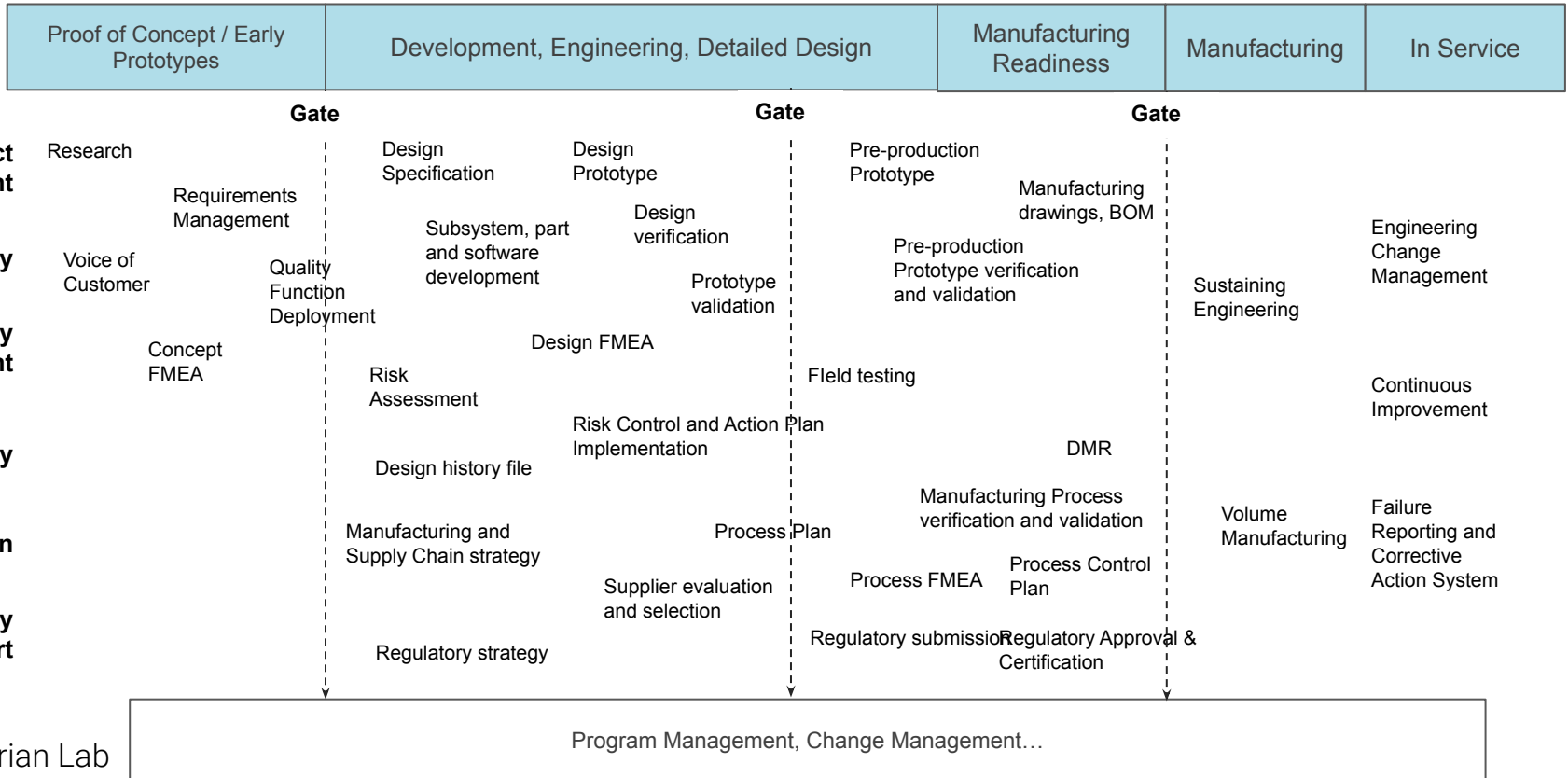
Increasing number customer and regulatory requirements



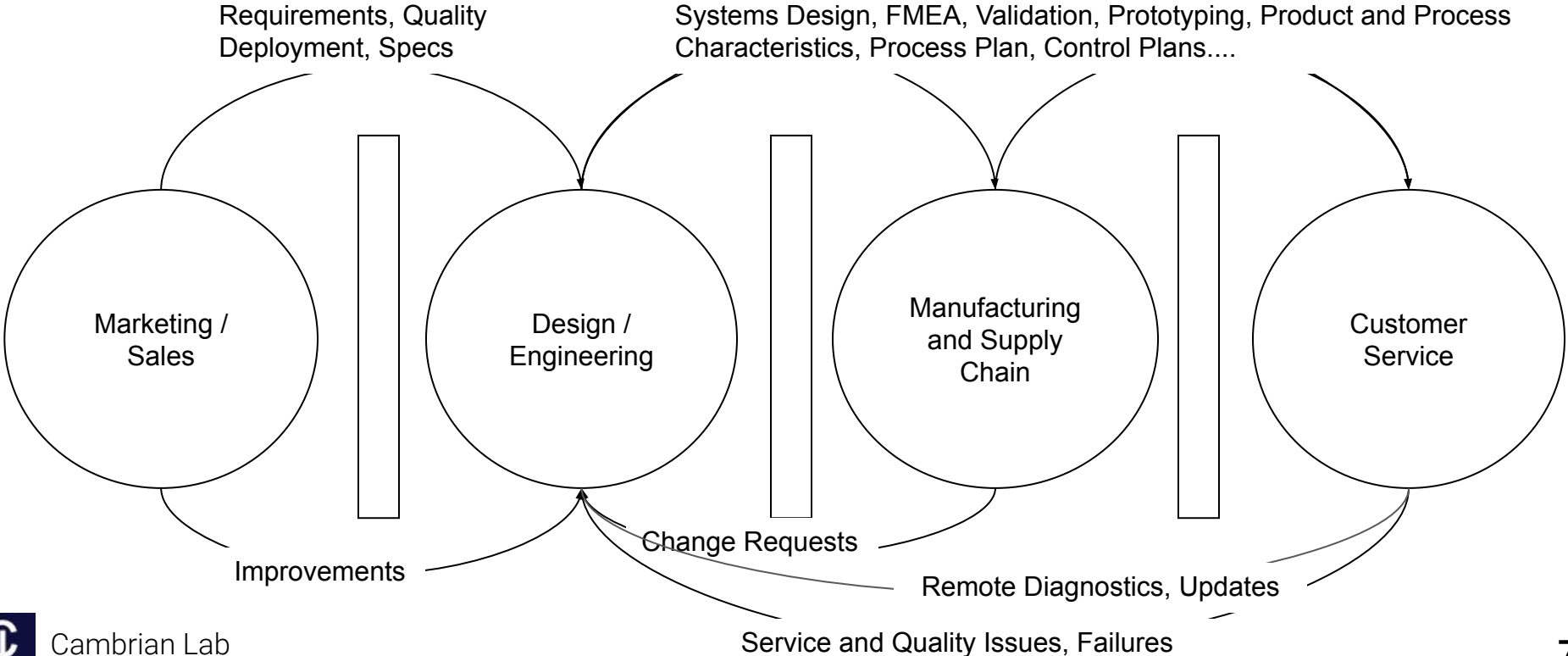
Complicated and risky supply chains

Never enough time for flawless launches

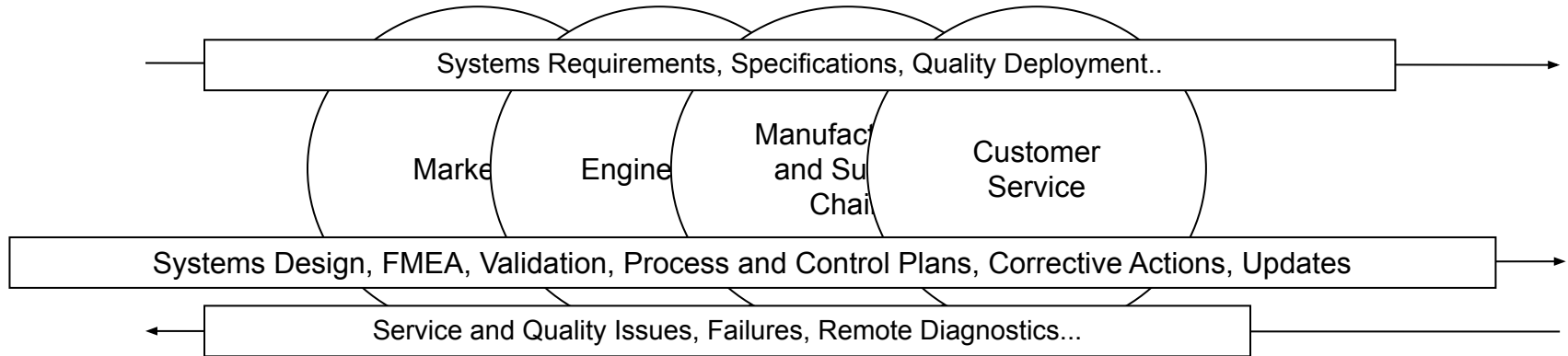
Orders of Magnitude of NPI Work



Process and Information Silos Are Obstacles to Achieving NPI Excellence

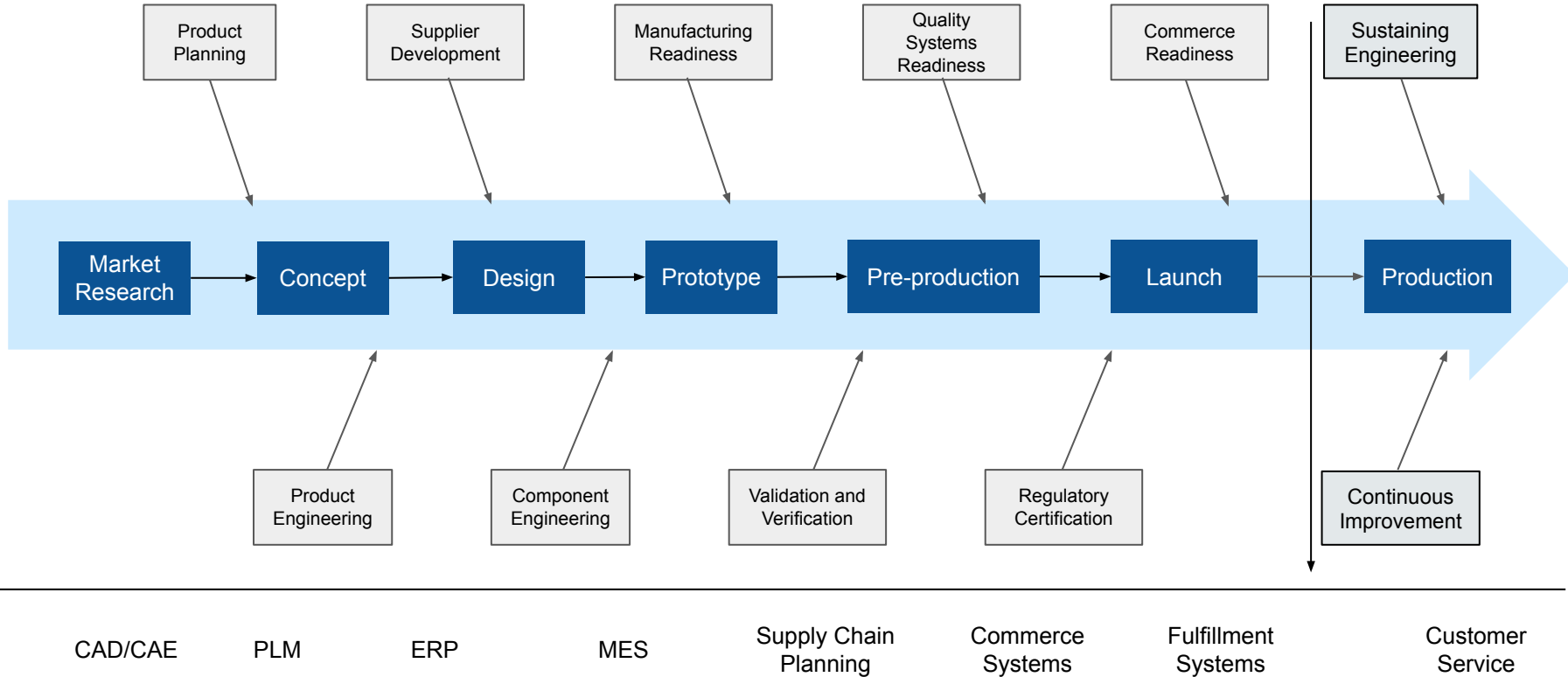


Cross-functional and Seamless NPI Process Orchestration is Essential



for
Faster Time-to-market
Fewer Product Launch Delays
Fewer Post-Launch Issues

Process Orchestration for NPI Excellence



New Product Introduction Excellence



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About Smart Global Holdings (SGH) and Penguin Edge

Our diverse lines of businesses, across computing, memory, and LED lighting solutions, all focus on serving customers by delivering engineer-driven technology solutions to specialty end markets

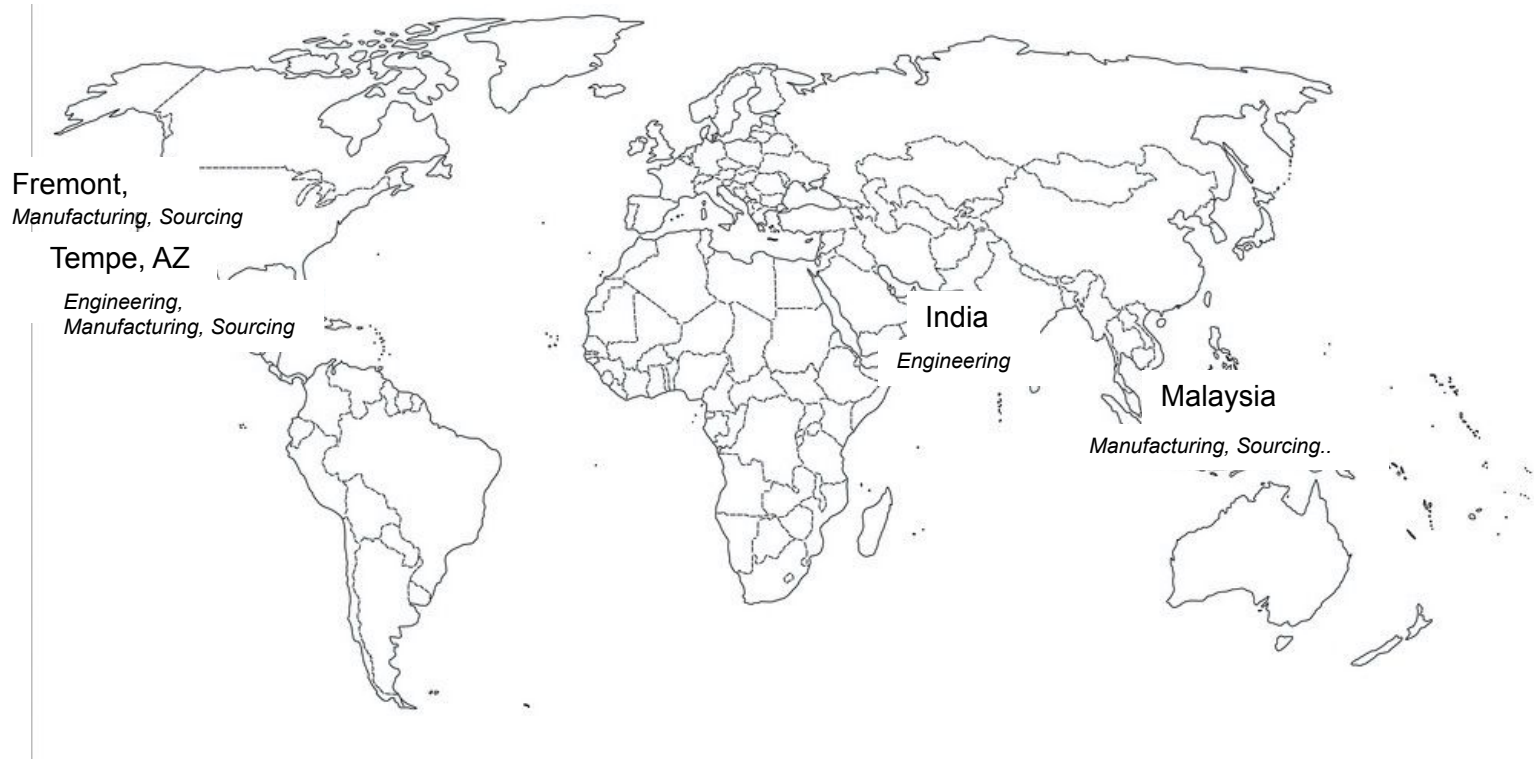
Key facts:

- ~4000 employees with the headquarter in California
- Manufacturing lines in US, South America and Asia
- Facilities across the globe
- Brands:
 - *Smart Modular (Memory Solutions)
 - *LED Solutions (CREE LED)
 - *Penguin Solutions (Intelligent Platform Solutions – IPS)

Penguin Edge is part of the Penguin Solutions Business unit. We provide deep expertise in embedded system design and development of smart devices for retail, medical, telecom, military and industrial products.



PLM Stakeholders



Our PLM Process Transformation

- Started with the move from Oracle to SAP
- Workflow driven PLM Processes (NPI, Release Processes, ECR/ECO, Component Engineering, BOM and Life Cycle Management)
- Deep integration with SAP and other applications













PLM Processes and System Coverage

- ZFlow and Oracle/SAP
- Set up processes and templates for :
 - ECO (Engineering Change order & post process)
 - CCN (Component change Notice)
 - PCN (Part change notification)
 - RN (Release notice)
 - NPR/NPMR (New part number (MFG) request)
 - Import BOMs/Part numbers
 - Bulk part numbers and BOM upload to SAP
 - Repository for documents
 - Datasheets
 - Customer notifications/PreAlerts









NPI/PLM Processes

Launch Pad

Product Engineering

 EIVC-ECO Implementation List Find New	 New EVAL Part Number Request List Find New	 Engineering Change Order List Find New	 Fast Track SAP Material Creation List Find New
 Fast Track SAP Material Update List Find New	 Manufacturing Deviation Order List Find New	 New Part Number Request (NPR) List Find New	 Pre Alert Process List Find New
 Release Notice List Find New	 Drawing Part List Find	 Document List Find	 Part/Assembly List Find

Component Engineering

 Component Change Notice List Find New	 EOL Notice (Marketing) List Find New	 EOL Database List Find New	 New Part Manufacturer Request List Find New
 PCN Analysis List Find New	 Data Sheet List Find	 Historical EOLDB List Find	 Manufacturer List Find

Workflows Drive Coordination and Participation at the Right Time

My Activities (26)

NPMR100532	Manufacturing review	Elisabeth.Fisher@smartm.com	Open Update Delegate
EOLDB101941	For Qualification	Cody.Butler@smartm.com	Open Update Delegate
EOLDB101944	For Qualification	Cody.Butler@smartm.com	Open Update Delegate
EOLDB101945	For Qualification	Cody.Butler@smartm.com	Open Update Delegate
EOLDB101946	For Qualification	Cody.Butler@smartm.com	Open Update Delegate

[more ...](#)

My Processes (38)

NPMR100532	Manufacturing review
NPMR100516	
MDO000447	Data preparation
ECO100918	
PCN101946	

My Data (8)

 SUPPLIER- Data to or ...	Drawing Part	Work In Process
 0107055A12D	Part/Assembly	
 0107065A01G	Part/Assembly	
 0107068A65E	Part/Assembly	

[more ...](#)

My Action Items (0)

No action items found

Favorites (1)

Elisabeth.Fisher@smartm.com	User
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My Tasks (0)

No tasks found

PLM Processes with ZFlow

- Extremely user-friendly and easy to participate/understand for cross-functional teams
- Very customizable and can support company/division specific PLM processes
- System is very reliable
- Direct integration to SAP and other systems (out-of-the-box and easy to configure)
- Higher efficiency (automation) and cycle-time reduction (workflow-based coordination)
- Customizable reports (Reviews, MPN quality checks..) and process improvement metrics (cycle times)
- Easy set up of workflows, conditions, templates and new accounts (accessible to business)



Seq No.	Activity Name	Activity Type	Conditions
50	<u>Start</u>	Process Start	None
100	<u>Data preparation</u>	Data Preparation	ECOType in ECO_DOC ECO_DOCREG ECO_DOCMFG
150	<u>Edit BOM</u>	Data Preparation	ECOType not in ECO_DOC ECO_MFG ECO_DOCREG ECO_DOCMFG ECO_LABEL ECO_TP
200	<u>Update ECO Summary</u>	Special Function	ECOType not in ECO_DOC ECO_DOCREG ECO_DOCMFG
250	<u>Checkin All Data</u>	Special Function	None
300	<u>CCB Chairperson Approval</u>	Approval	ECOType not in ECO_ROUTING
350	<u>Doc Control</u>	Approval	ECOType in ECO_ROUTING
400	<u>Add ECO Description</u>	Data Preparation	ECOType in ECO_REL_LBL ECO_REL_HIGH ECO_REL
450	<u>ECO Notification</u>	Notification	ECOType not in ECO_CCR ECO_DOC ECO_DOCREG ECO_DOCMFG ECO_LABEL ECO_TP
500	<u>Test Approval</u>	Approval	ECOType in ECO_MASS ECO_REL_LBL ECO_REL_HIGH ECO_REL ECO_TP ECO_VAIDS ECO_ROUTING AND SWFWImpact in ECO_FSI_FW ECO_FSI_FWSW ECO_FSI_SW ECO_FSI_PROCEDURE
550	<u>Safety & Repair & Sales</u>	Parallel	ECOType in ECO_MASS ECO_REL_LBL ECO_REL_HIGH ECO_REL
600	<u>Block part number</u>	Approval	ECOType in ECO_REL_LBL ECO_REL_HIGH ECO_REL ECO_UNREL ECO_VAIDS AND ManufacturingSite in SITE_PENANG SITE_PENANG_TEMPE
650	<u>Parallel Approval Penang</u>	Parallel	ECOType in ECO_DOCMFG ECO_LABEL ECO_MASS ECO_REL_LBL ECO_REL_HIGH ECO_REL ECO_UNREL ECO_VAIDS ECO_ROUTING AND ManufacturingSite in SITE_PENANG SITE_PENANG_TEMPE
700	<u>Parallel Approval Newark</u>	Parallel	ManufacturingSite in SITE_NEWARK SITE_TEMPE_NEWARK AND ECOType in ECO_DOCMFG ECO_LABEL ECO_MASS ECO_REL_LBL ECO_REL_HIGH ECO_REL ECO_UNREL ECO_VAIDS
750	<u>Parallel approval Tempe</u>	Parallel	ManufacturingSite in SITE_TEMPE SITE_TEMPE_NEWARK SITE_PENANG_TEMPE AND ECOType in ECO_MASS ECO_REL_LBL ECO_REL_HIGH ECO_REL ECO_UNREL ECO_VAIDS
800	<u>ECO MFG Approval</u>	Approval	ECOType in ECO_DOCMFG AND ManufacturingSite in SITE_TEMPE SITE_TEMPE_NEWARK SITE_PENANG_TEMPE
850	<u>CCR Repair Approval</u>	Approval	ECOType in ECO_CCR
900	<u>CCR Sales Approval</u>	Approval	ECOType in ECO_CCR
950	<u>DOC REG Approval</u>	Approval	ECOType in ECO_DOCREG
1000	<u>IT WIPTRACK Approval</u>	Approval	ECOType in ECO_LABEL ECO_REL_LBL
1050	<u>Update Material in SAP</u>	Special Function	ImplementInSAP in + AND ECOType not in ECO_DOC ECO_DOCREG ECO_DOCMFG ECO_ROUTING

Workflow example

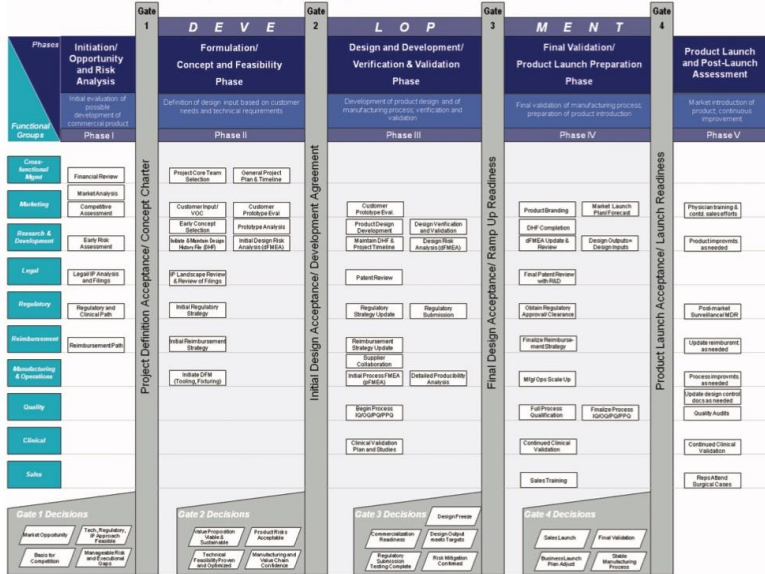


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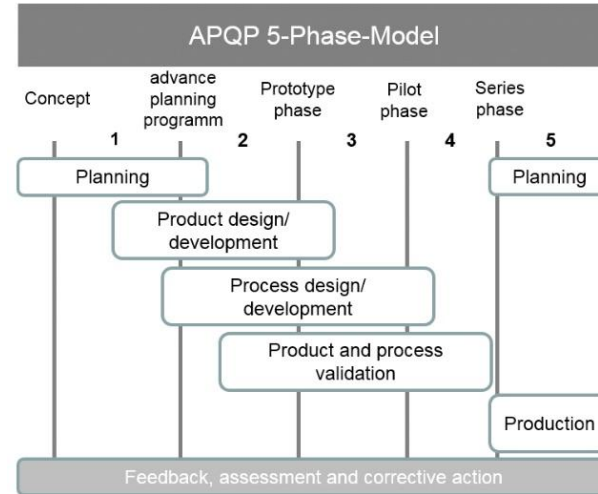
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NPI for Different Products/Industries

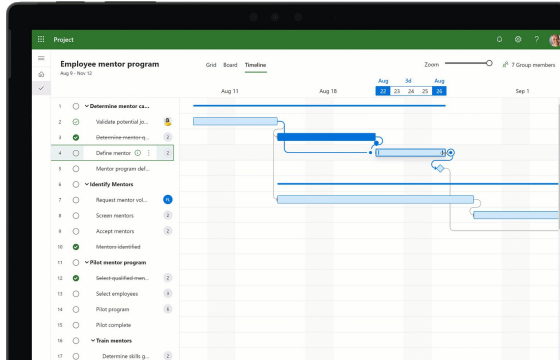
Medical Device Development: High-level Representation of Development Phases and of Functional Activities



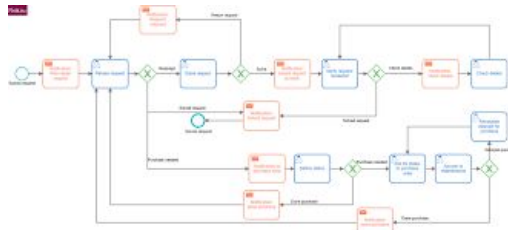
Source: Stage Gate Process for the Development of Medical Devices
Jan B. Pietzsch, et al



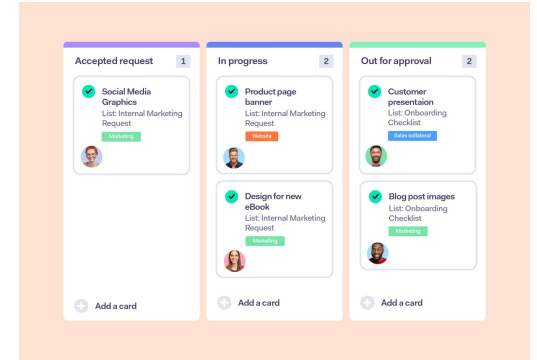
Is NPI a Project (or) Process (or) ???



Project

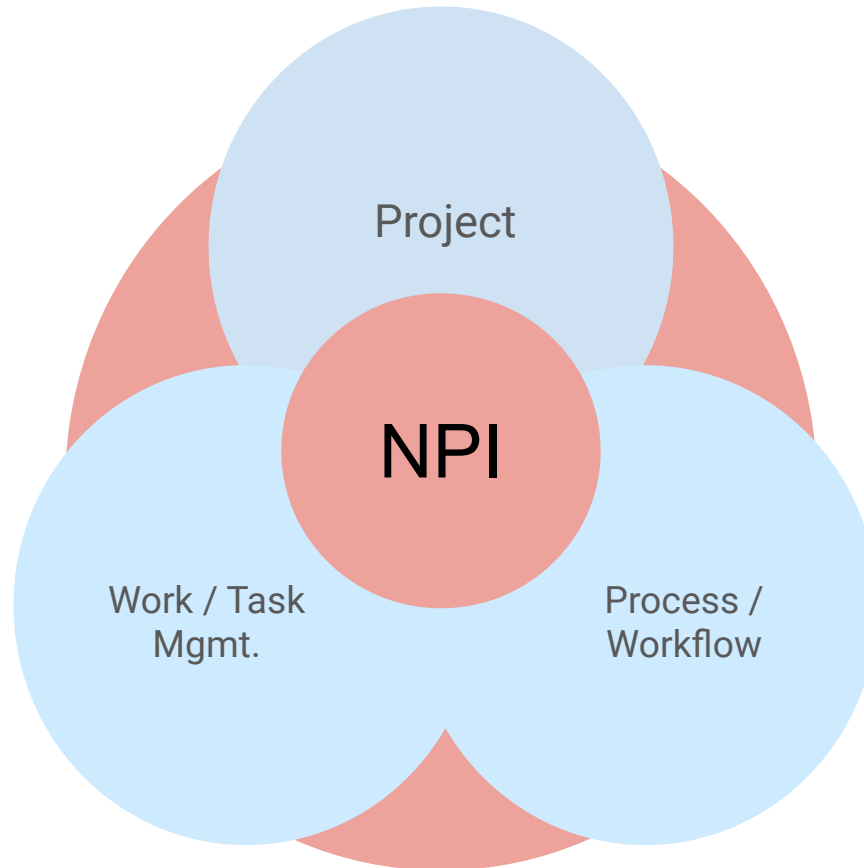


Process

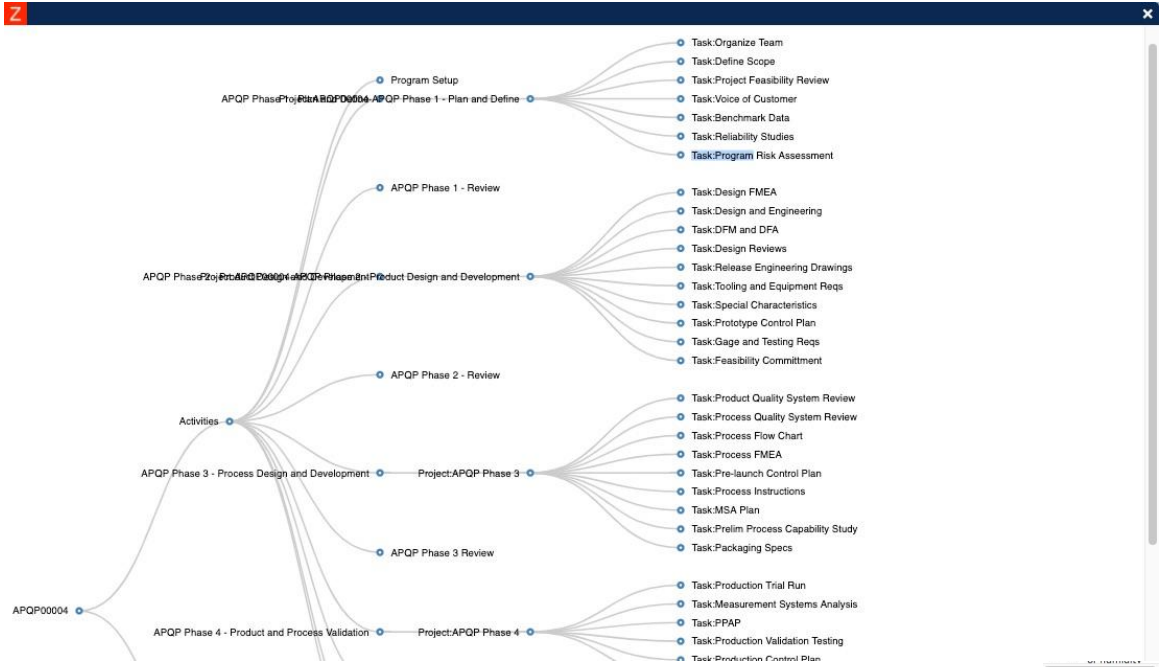


Kanban Board

NPI is a Combination and Requires Orchestration



NPI Process Orchestration



Bubble CPAP System

Show Document Tree Close Comments Action Items

Form Identifier:	Bubble CPAP Design FMEA	Form Name:		Part Number:	Bubble CPAP System
Description:		Status:	Work In Process	Rev.:	A
Rev.Status:	Pending	Created By:	admin@zps.io	Creation Date:	2019/12/03 11:06:50
Updated By:		Last Update:	2019/12/03 11:06:50		

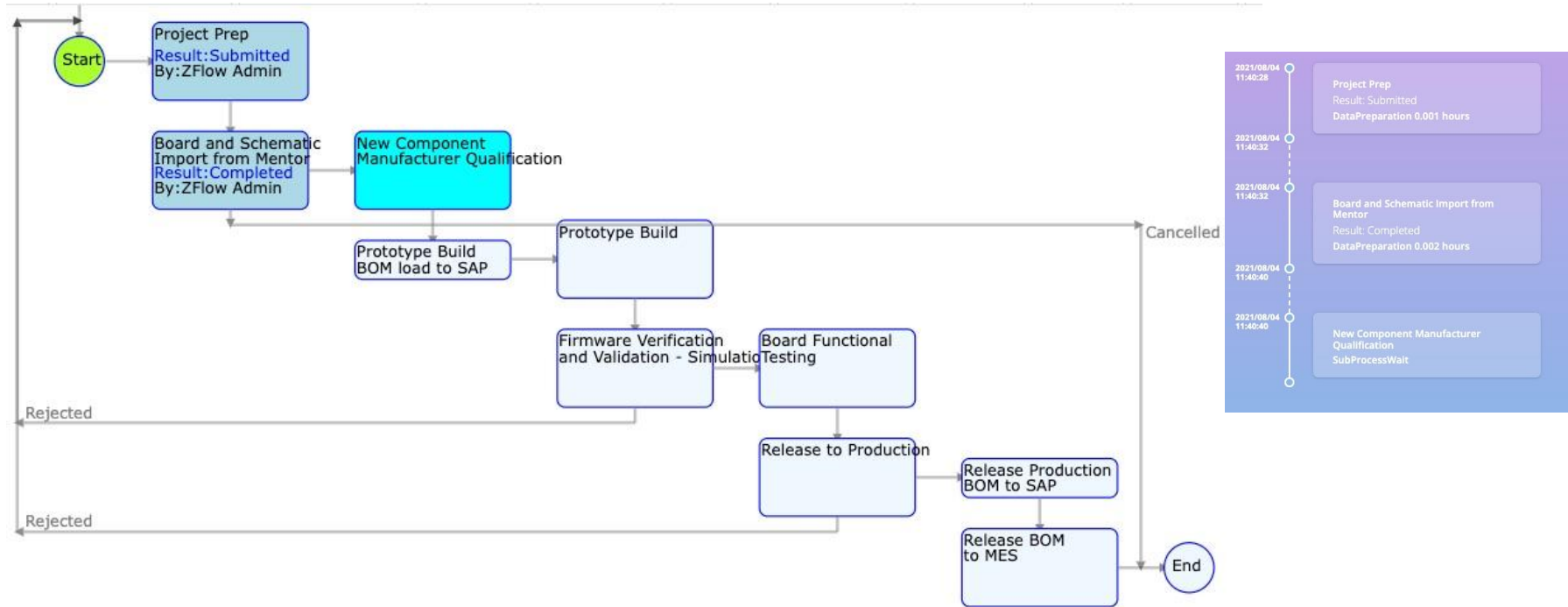
Default All

#	System	System Interface	Component Interface	Function
<input type="checkbox"/> 1	Bubble CPAP System			Provide positive air pressure to patient
<input type="checkbox"/> 2	Bubble CPAP System			Provide appropriate level of humidity

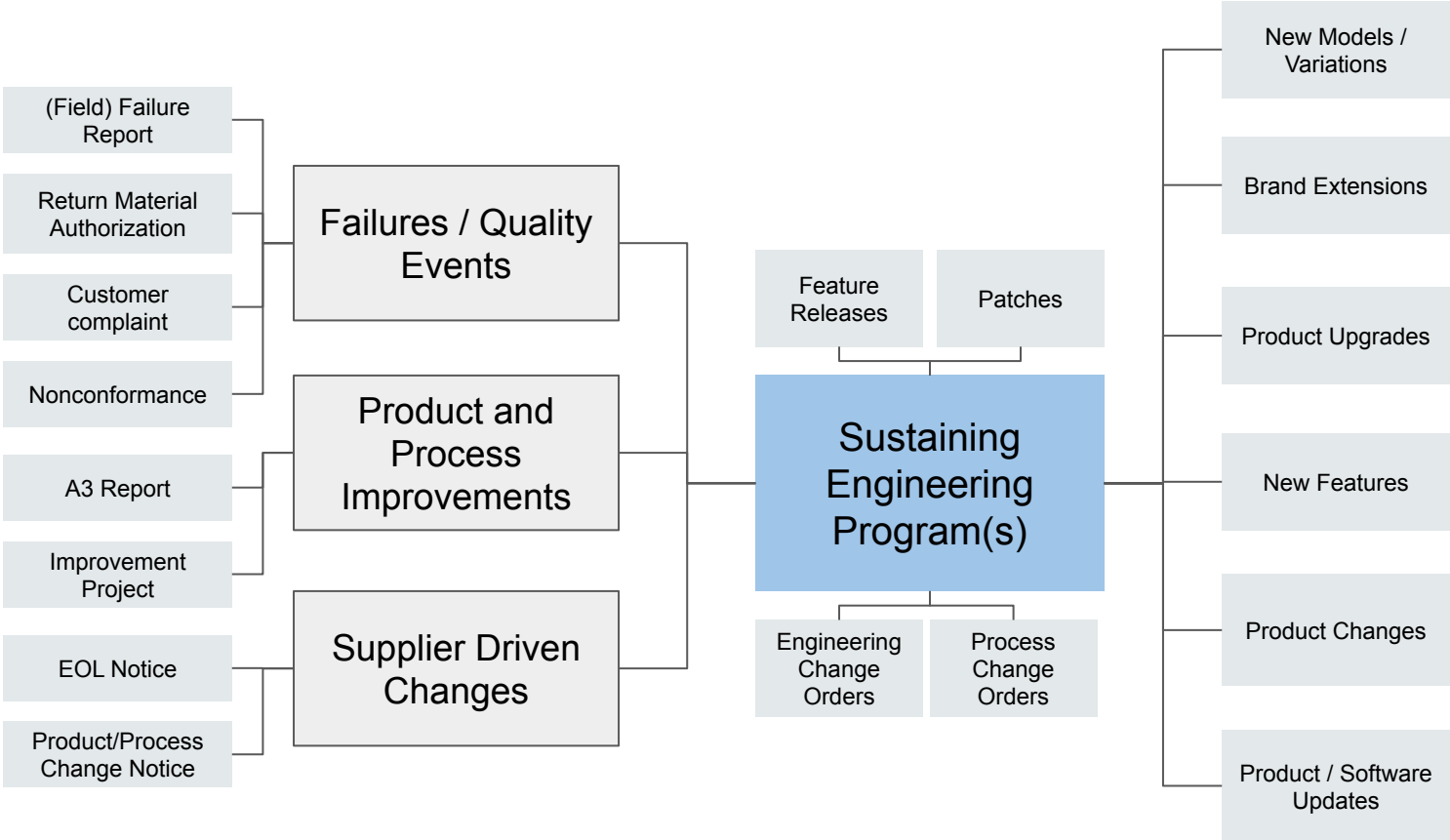
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Workflow Driven Approach to NPI/Sustaining Engineering



Sustaining Engineering



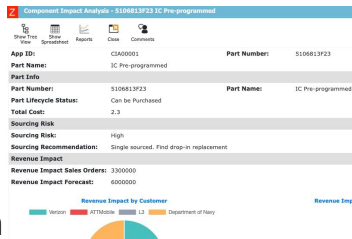
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Component Engineering

Component Engineering & Supply

- Widespread shortages
- Lead times still increasing
- Ensure allocation from at least one supplier
- Aggressive multisourcing
- Know impact (revenue and customer)



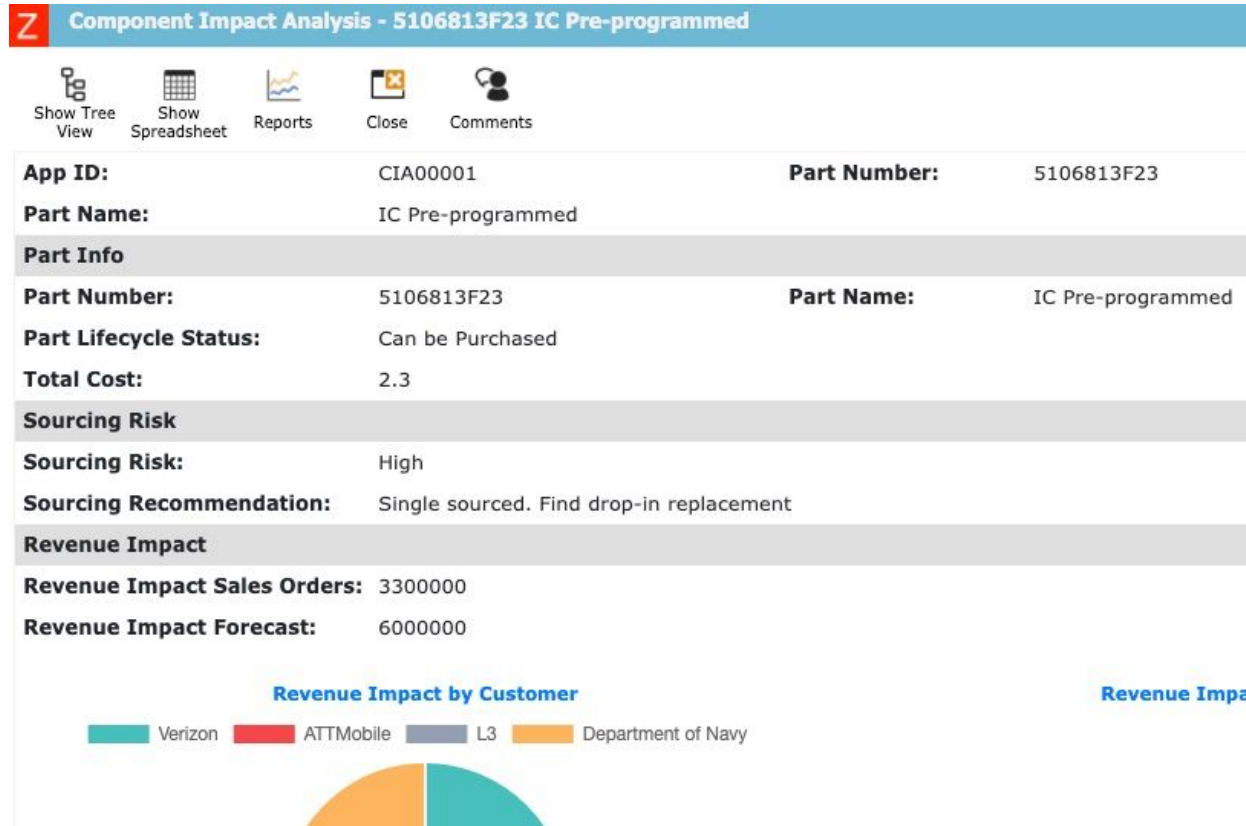
Manufacturer Part Changes

- Quickly address impact of Manufacturer Part Changes on assemblies and finished goods
- Requalification and change implementation

Manufacturer Part End-of-life

- Last Time Buy from Manufacturers (requires visibility into expected future volumes)
- Essentially buy time and have enough until Redesign and Requalification
- Last resort, EOL your product
- Customer communication

Component Impact Analysis

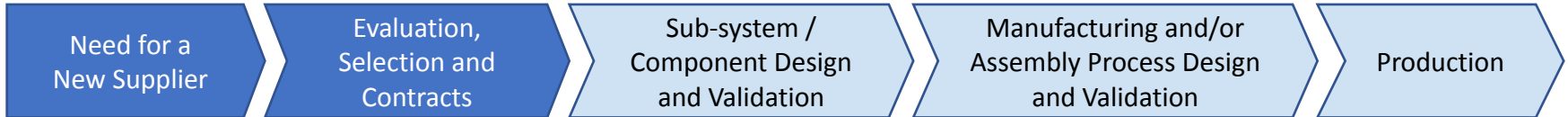
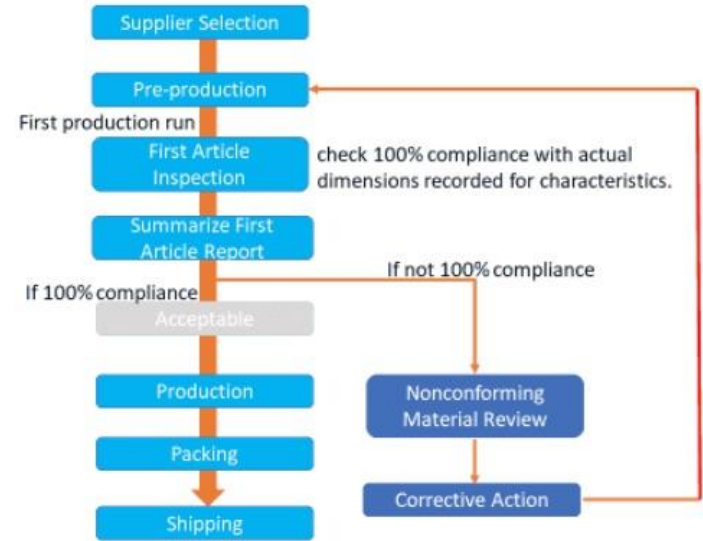
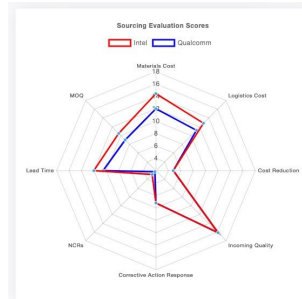


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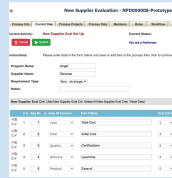
NPI Sourcing

- ❑ One of the most important and time consuming facets of NPI
- ❑ Cost is not the only consideration
- ❑ NPI Sourcing is not complete until Supplier is shipping



Supplier Development

Evaluation, Audit and Performance Assessment



Category	Area	Performance Object	Question	Program	Weighted Factor	Score	Notes
Quality	Yield	Yield during startup	How long did it take to hit the target yield?	MeasX	0.00000	4	D
				MeasY	0.00000	4	D
	Defects	Number of Defects	Number of observed defects	MeasX	0.00000	4	D
				MeasY	0.00000	4	D
Product Technology	Hardware	Fit and Finish	Paint gaps	MeasX	0.00000	7	D
				MeasY	0.00000	7	D
Process Technology	Process Stability	Throughput	How long did it take to hit the target?	MeasX	0.00000	4	D
				MeasY	0.00000	4	D
Cost	Initial Cost	Initial Cost	What is the initial cost?	MeasX	0.00000	7	D
				MeasY	0.00000	7	D



Supplier Development Activities

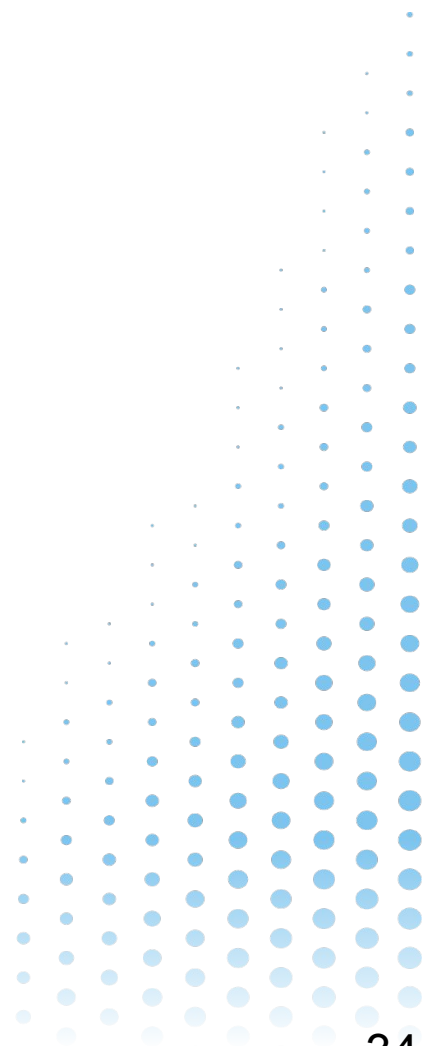
- Training
- Investment
- Engineering Support
- Supplier Quality Engineering
- Corrective Actions
- 8D / A3 Report / Kaizen Event
- Recognition and Reward

New Product Introduction Excellence



Summary

- ❑ *Proven success in any industries*
- ❑ *Easy to adopt and loved by users and stakeholders*
- ❑ *Test Drive or Free Pilot*



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For More Information

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