

IEEE Webinar

May 17th 2018

Erich Meier, CTO, Method Park

Bret Greenstein, VP Watson IoT, IBM

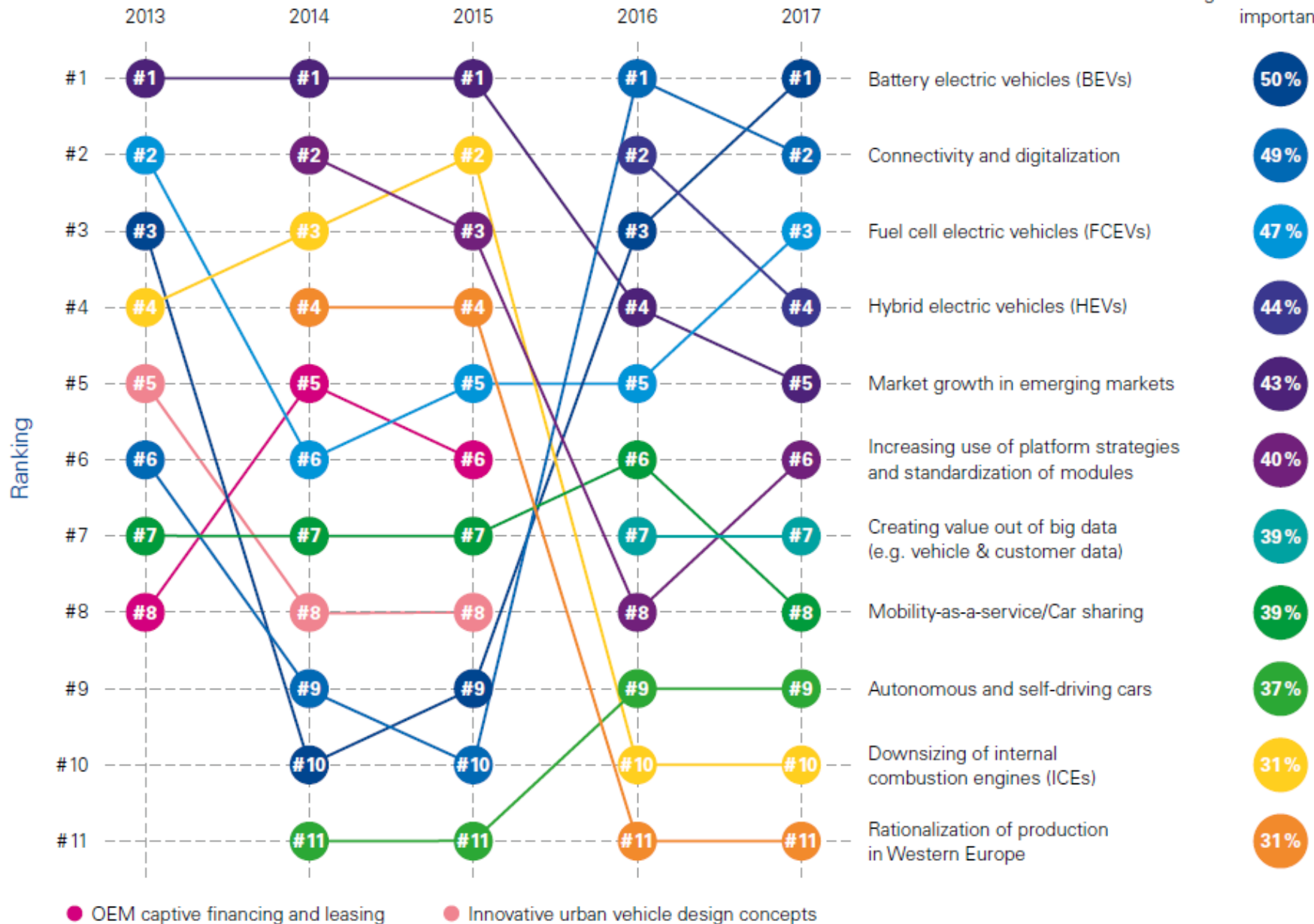
Transform Engineering

through

Process Excellence



Percentage of executives rating a trend as extremely important



Electrification

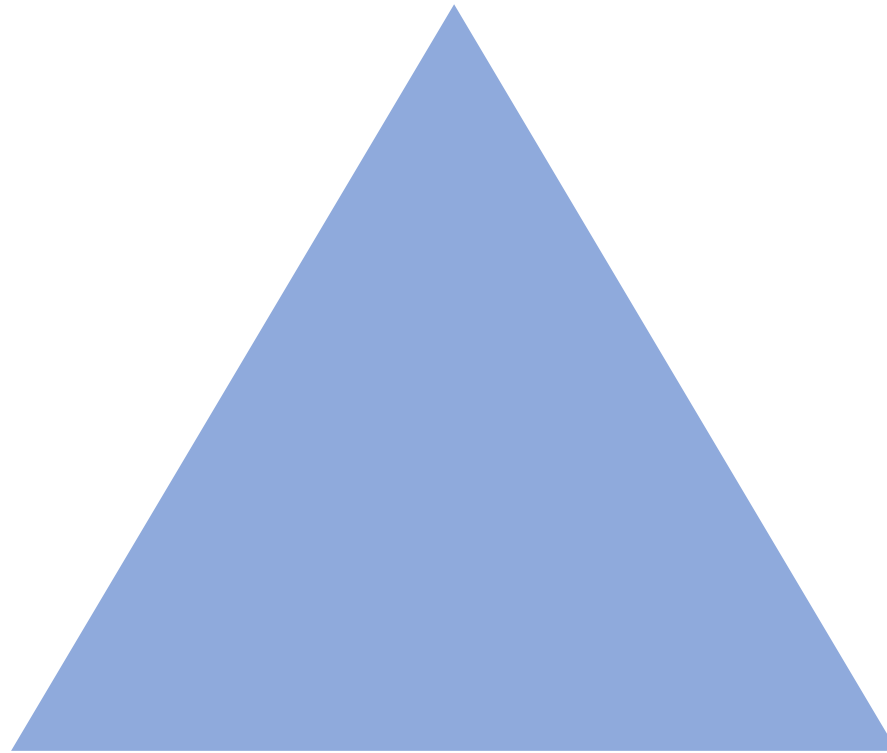
Digitization

Platforms

Autonomy

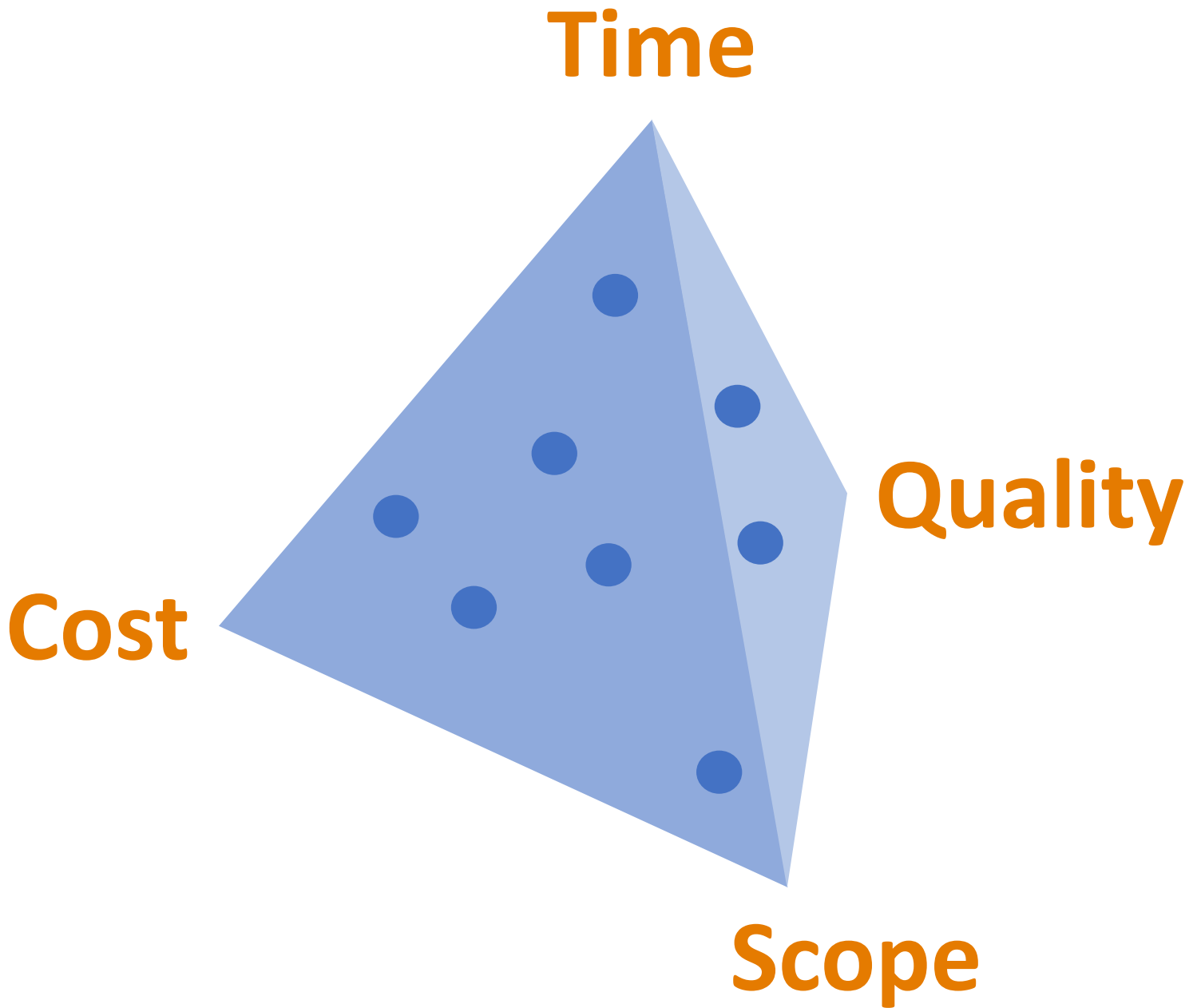
Sharing

Quality



Cost

Time



Electrification

Digitization

Software Everywhere,
Hyperconnectivity

Platforms

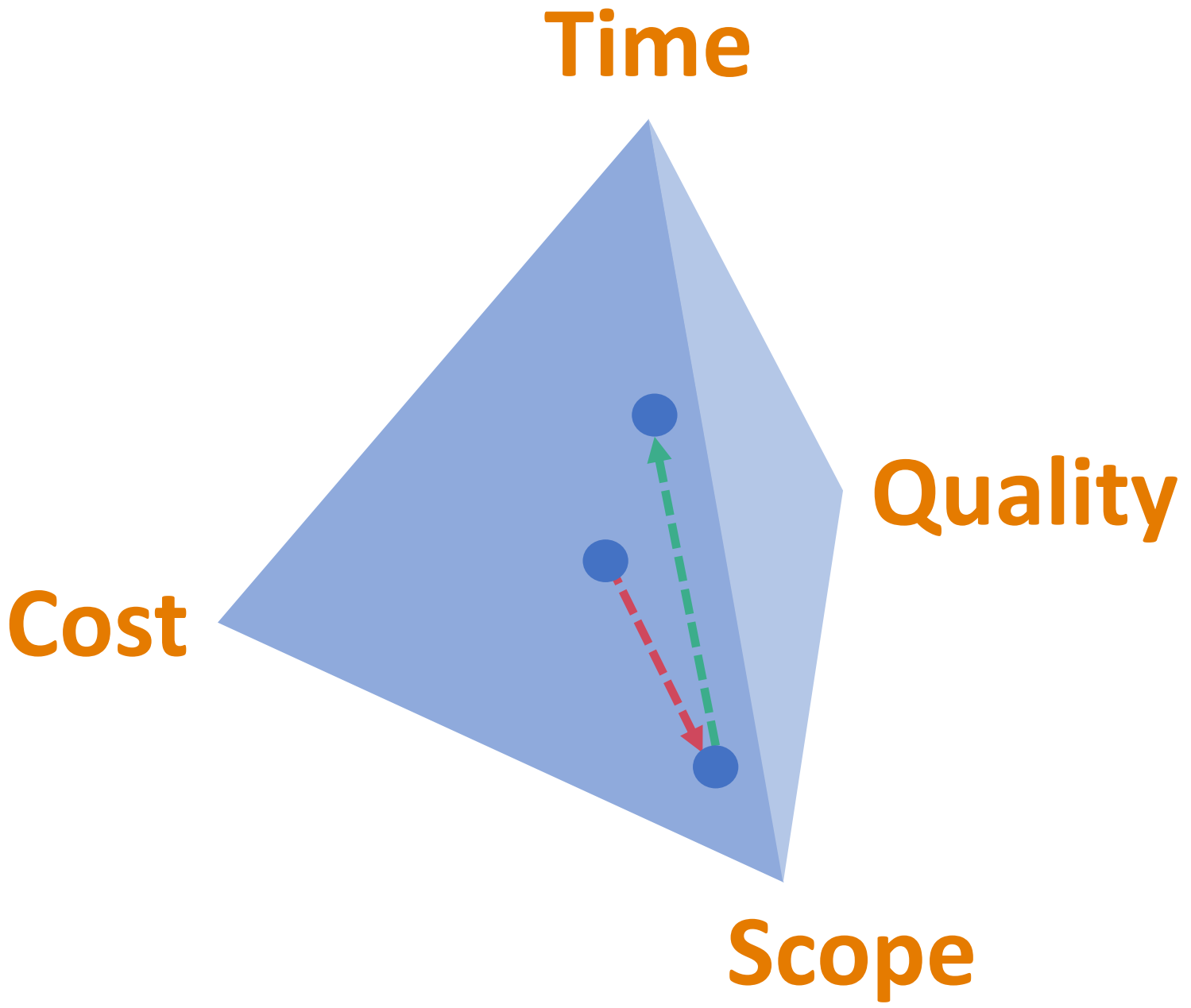
Reuse & Adaptation,
Generating Products

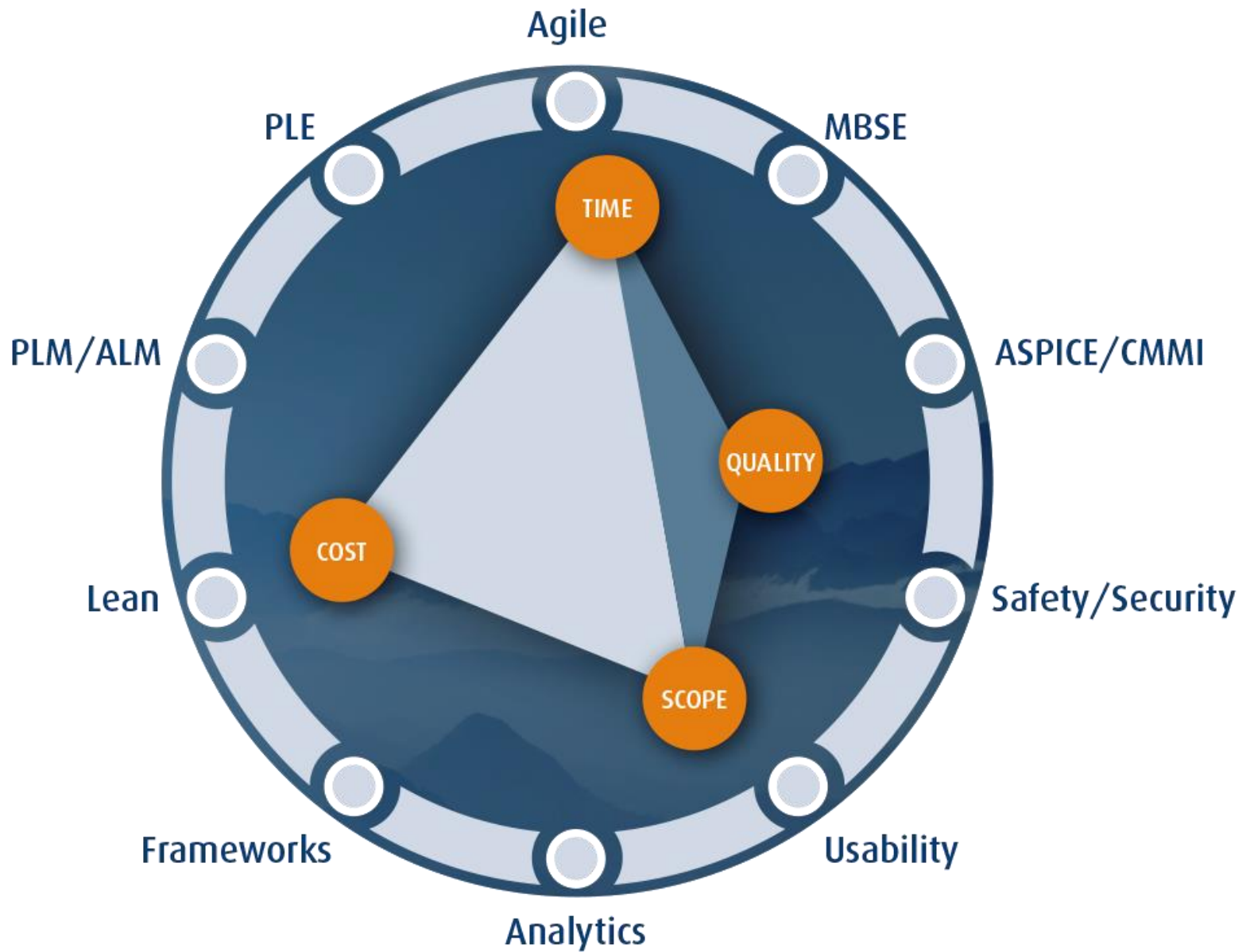
Autonomy

Machine Learning,
Laws, Ethics

Sharing

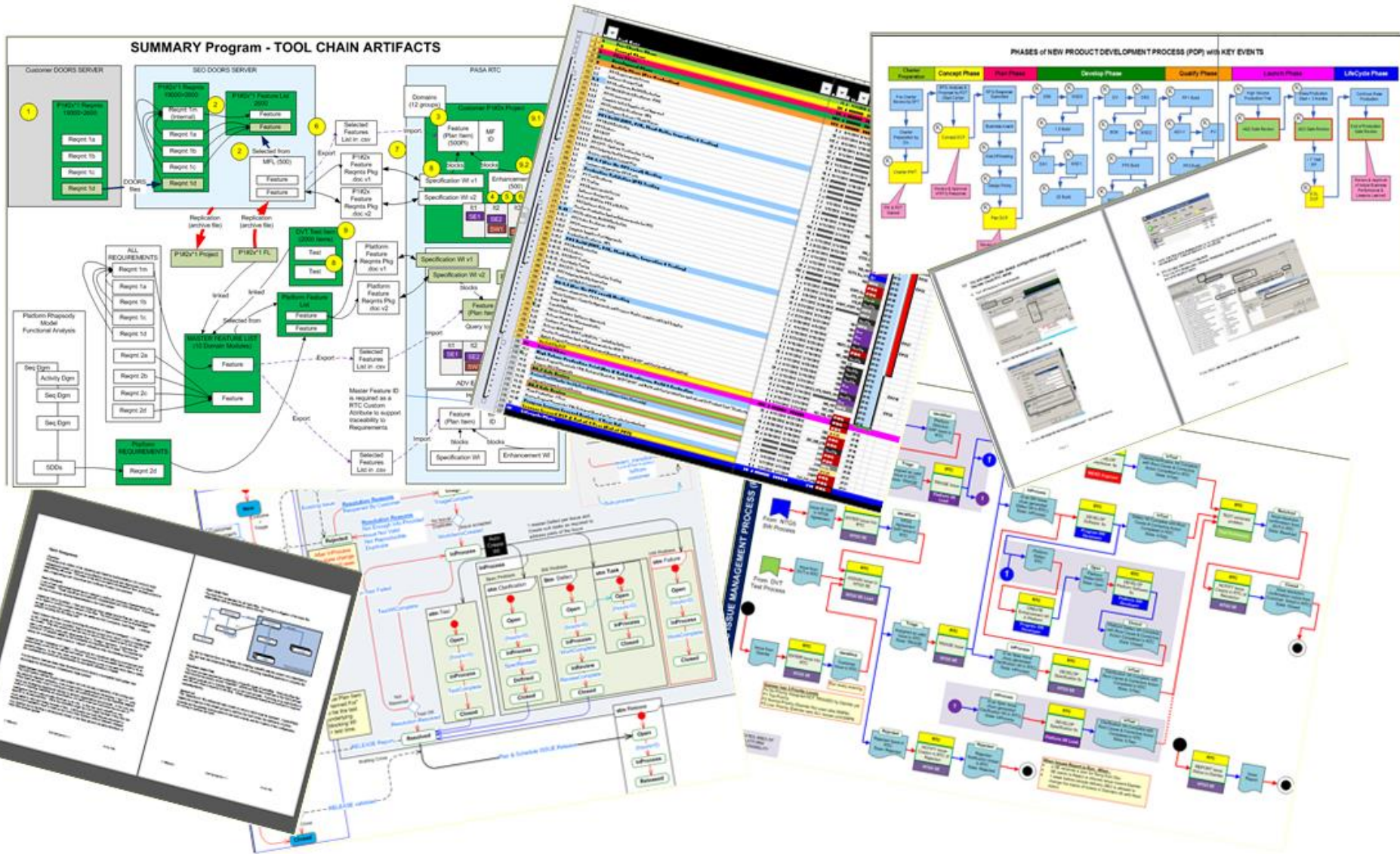
Disruption of
Business Models





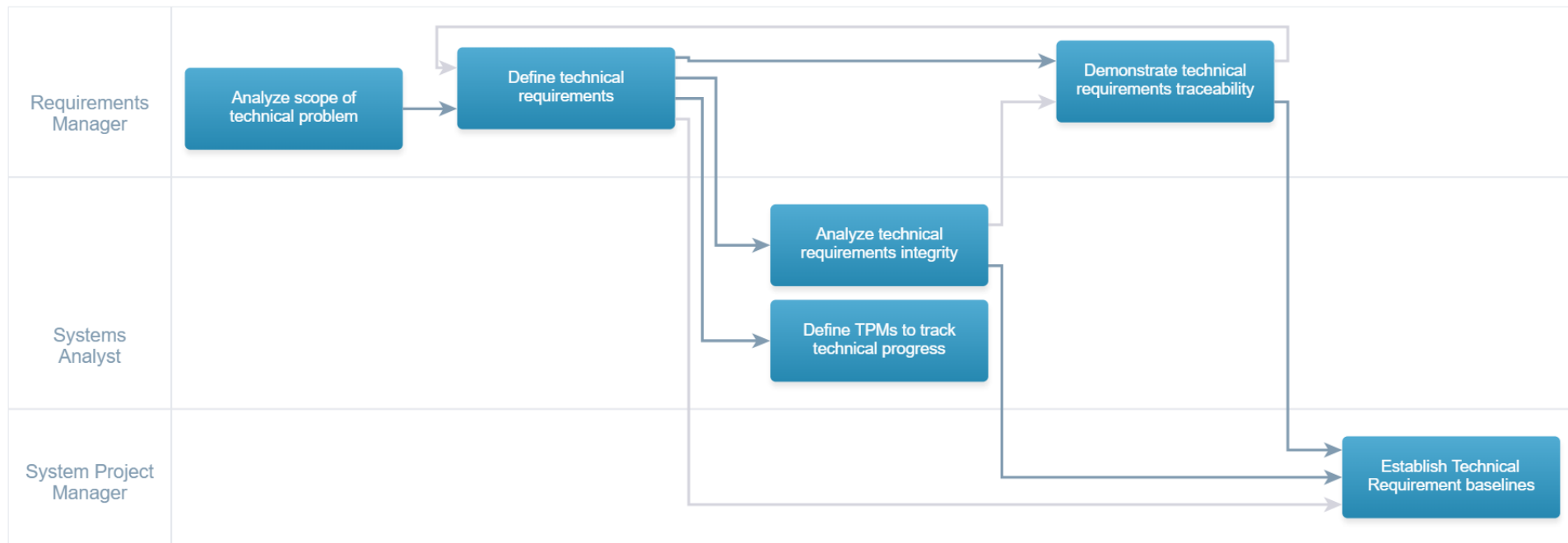
Process Excellence

The Sad Reality

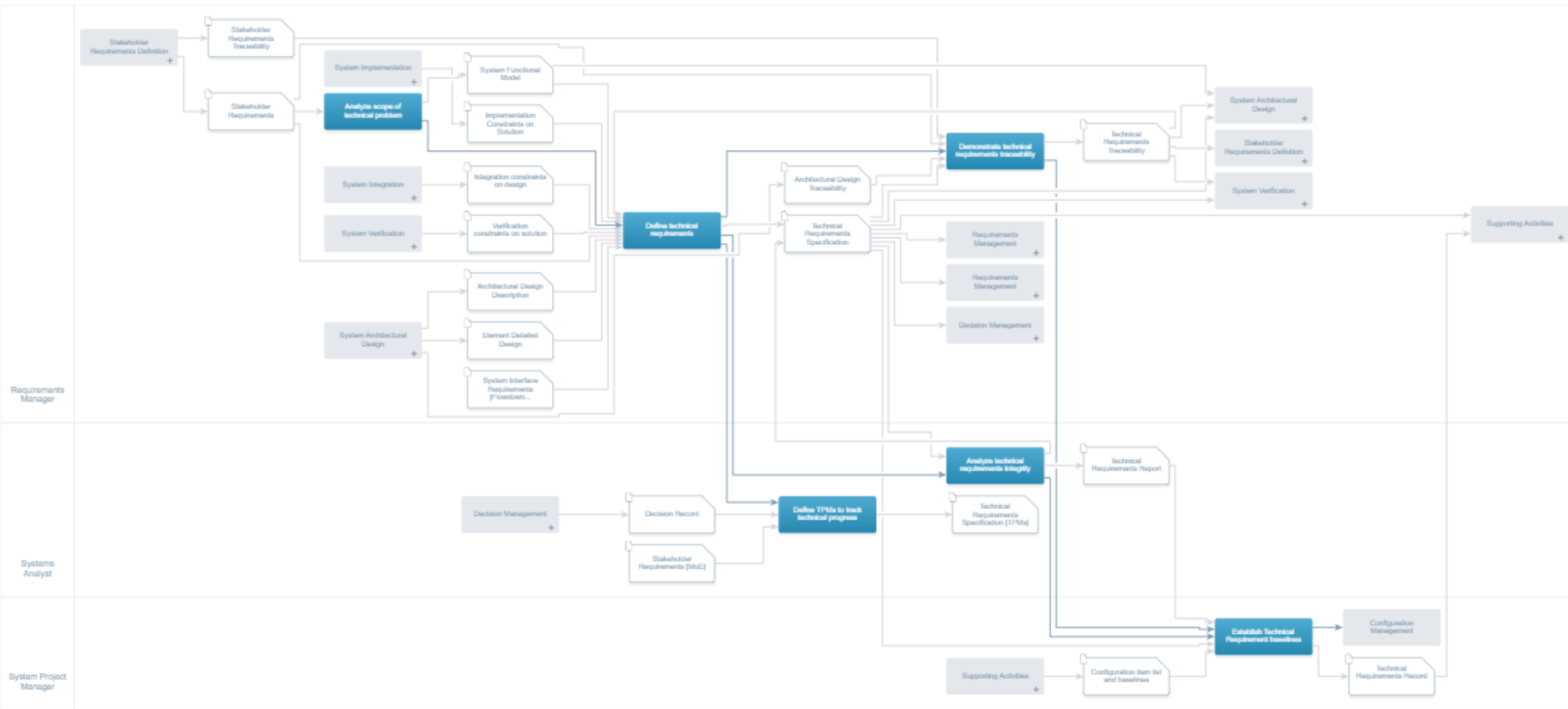


Model Based Process Management

Process as a Swimlane



Same Process including Deliverable Flow



Same Process for Experts

FLOW GRID TABLE



DESCRIPTION

Description

Analyze the scope of the technical problem to be solved. Define the functional boundary of the system in terms of the behaviour and properties to be provided. This task resolves the design boundary, identifying the following:

- Which system functions are under design control and which are not
- Expected interaction among system functions (data flows, human responses, and behaviors)
- External physical and functional interfaces (mechanical, electrical, thermal, data, procedural) with other systems
- Required capacities of system products

WORK PRODUCTS

Inputs 1

 [Stakeholder Requirements](#)

Outputs 1

 [System Functional Model](#)

Same Process as SIPOC Table

Supplier	Inputs	Process	Outputs	Customer
Stakeholder Requirements Definition	<ul style="list-style-type: none"> Stakeholder Requirements 	Analyze scope of technical problem	<ul style="list-style-type: none"> System Functional Model 	System Architectural Design
System Architectural Design System Integration System Verification System Implementation Stakeholder Requirements Definition	<ul style="list-style-type: none"> Architectural Design Description Integration constraints on design Verification constraints on solution Implementation Constraints on Solution System Interface Requirements Technical Requirements Traceability Element Detailed Design System Functional Model Stakeholder Requirements 	Define technical requirements Define TPMs to track technical progress Analyze technical requirements integrity Research technical	<ul style="list-style-type: none"> Technical Requirements Specification 	Requirements Management Requirements Management System Architectural Design System Verification Supporting Activities Decision Management
Decision Management	<ul style="list-style-type: none"> Decision Record Stakeholder Requirements 	Define TPMs to track technical progress	<ul style="list-style-type: none"> Technical Requirements Specification 	
	<ul style="list-style-type: none"> Technical Requirements Specification 	Analyze technical requirements integrity	<ul style="list-style-type: none"> Technical Requirements Specification Technical Requirements Report 	Requirements Management Requirements Management System Architectural Design System Verification Supporting Activities Decision Management
Stakeholder Requirements Definition	<ul style="list-style-type: none"> Stakeholder Requirements Architectural Design Traceability 	Research technical	<ul style="list-style-type: none"> Technical Requirements 	Stakeholder Requirements Definition

Same Process seen from Role

Requirements Manager

DESCRIPTION

Description

The Requirements Manager elicits, develops and analyses the requirements.

Tasks










- Collecting the stakeholder requirements and documenting them
- Analysing the stakeholder requirements and resolving ambiguities in consultation with other team members
- Definition of the system's technical requirements
- Defining the logical architecture of the system along with the systems analyst
- Maintaining the requirements database
- Ensuring the traceability of the requirements is maintained
- Extending support to the Systems Architect, Systems Analyst and Systems Engineer

Required knowledge and skills

- Thorough knowledge about the users and environment of the intended system

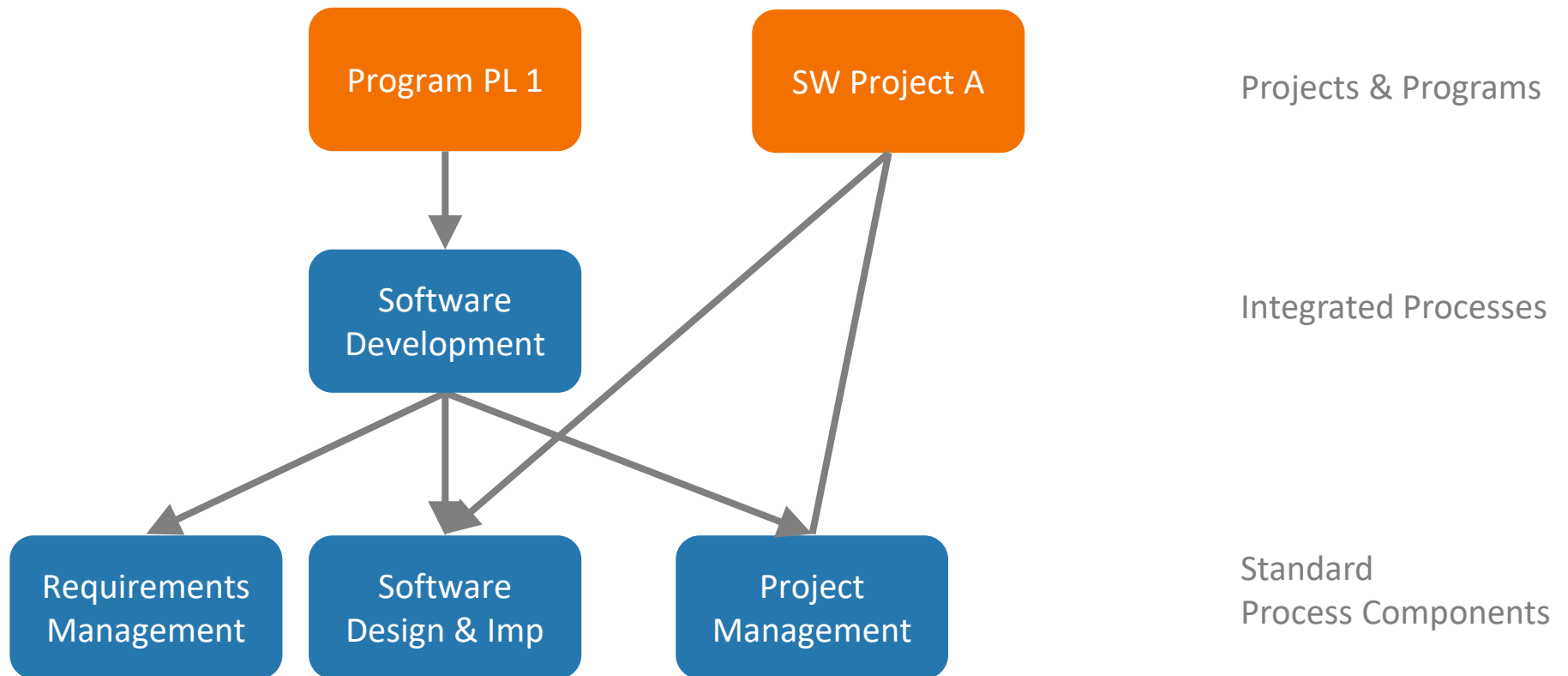
ACTIVITIES

Responsible 11 

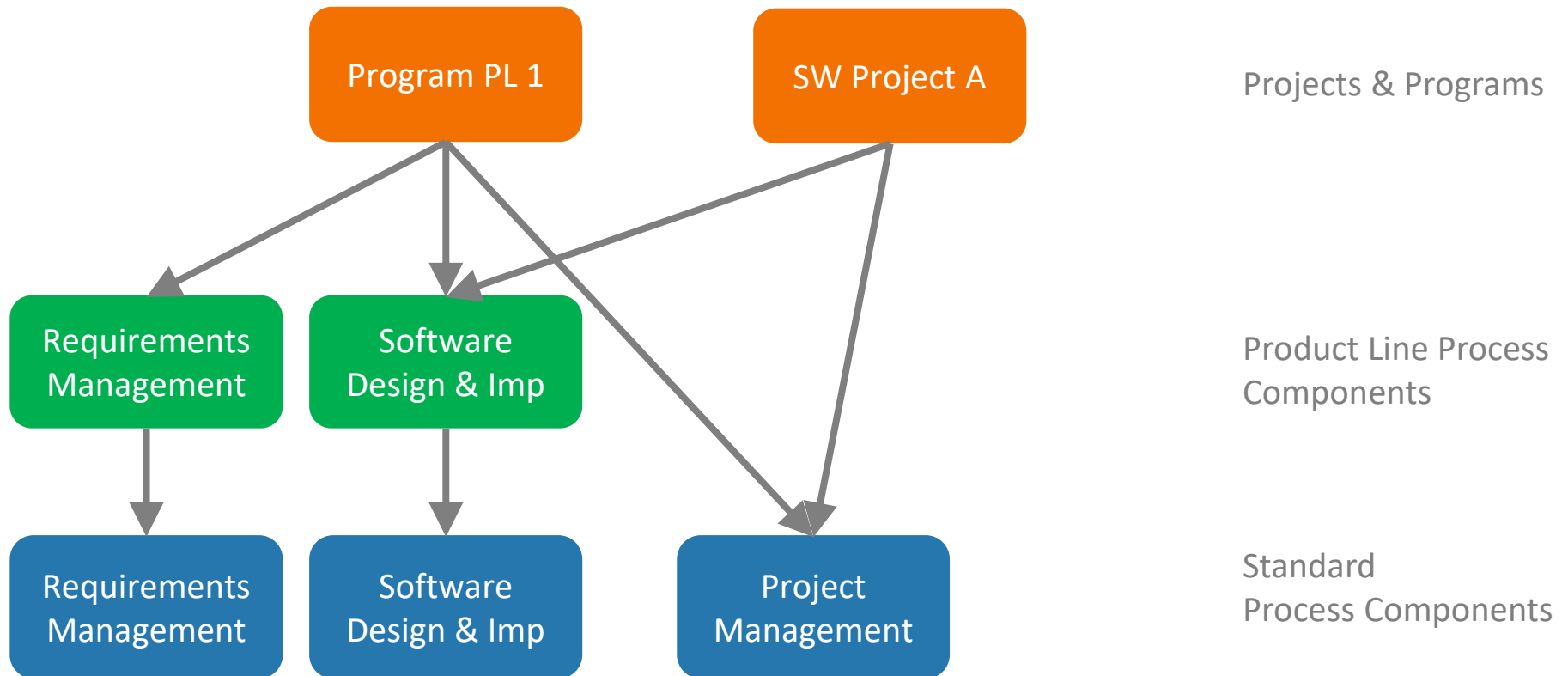
-  Elicit stakeholder requirements
-  Establish Stakeholder Requirement baselines
-  Identify stakeholders
-  System Requirements Analysis
-  Stakeholder Requirements Definition
-  Maintain stakeholder requirements traceability
-  Define Stakeholder Requirements
-  Review stakeholder requirements with stakeholders
-  Define technical requirements

Process Composition

Create Processes from Components



Create Product Line Processes from Tailored Process Components



Standard Compliance

Manage Compliance

Automotive SPICE 2.5/3.1 & ISO 26262:2018

AS9100D & DO-178B/C & DO-254

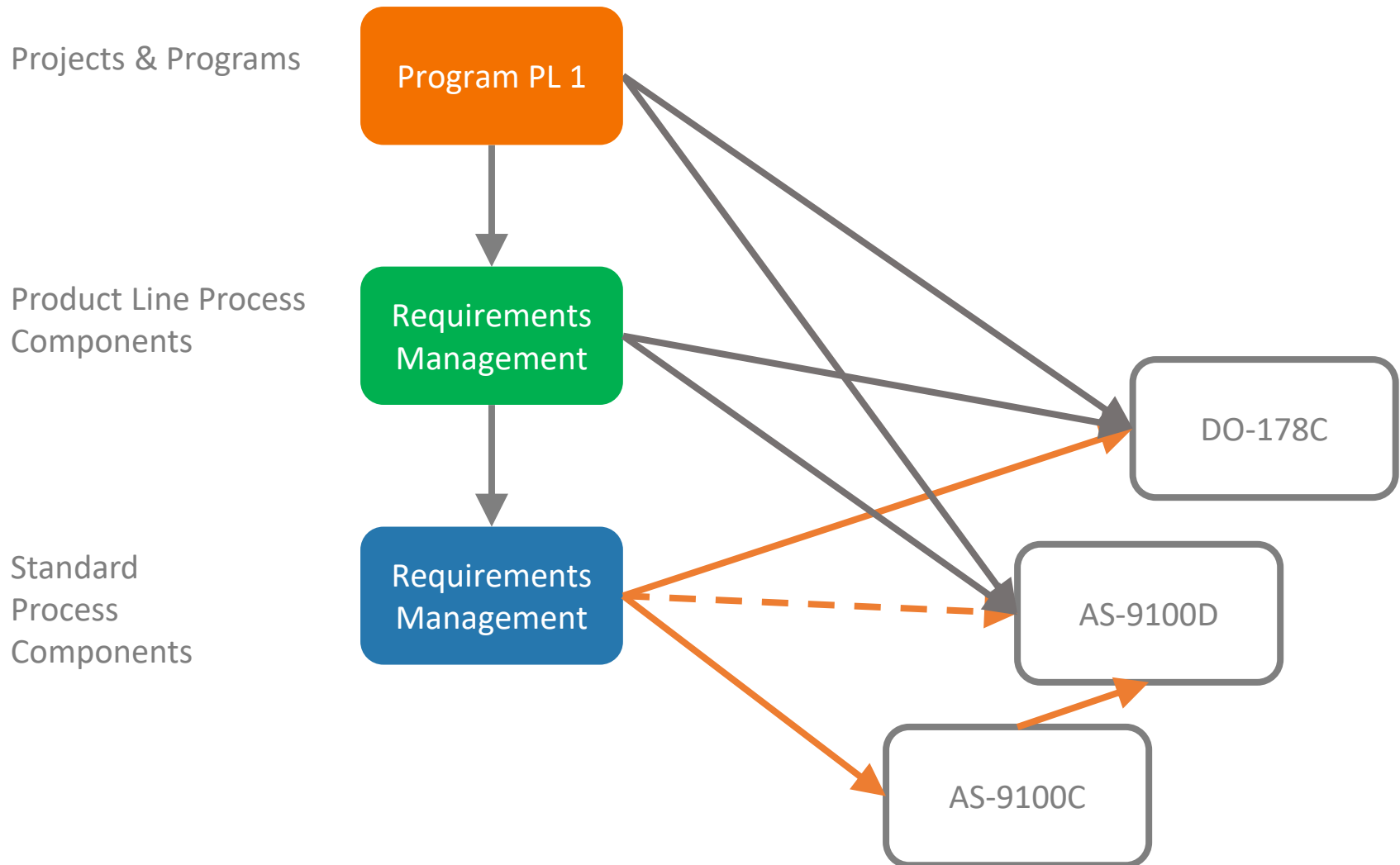
ISO 13495 & ISO 14971

CMMI V1.3 & V2.0

ISO/IEC 15288 (INCOSE Handbook)

APQC Process Classification Frameworks

Compliance by Mapping

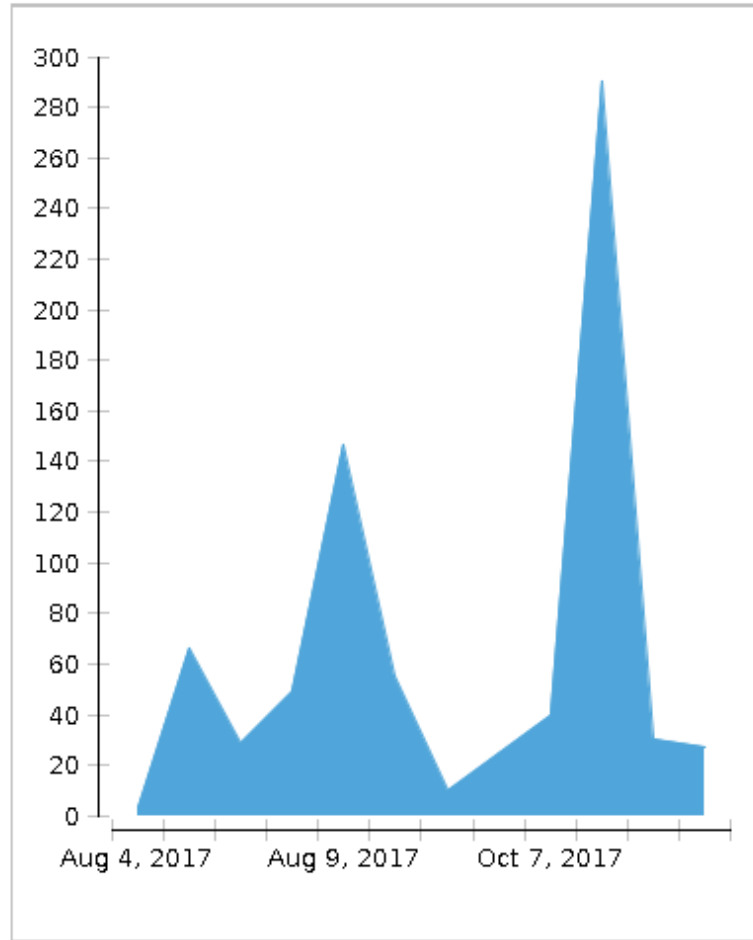


Generate Compliance Evidence

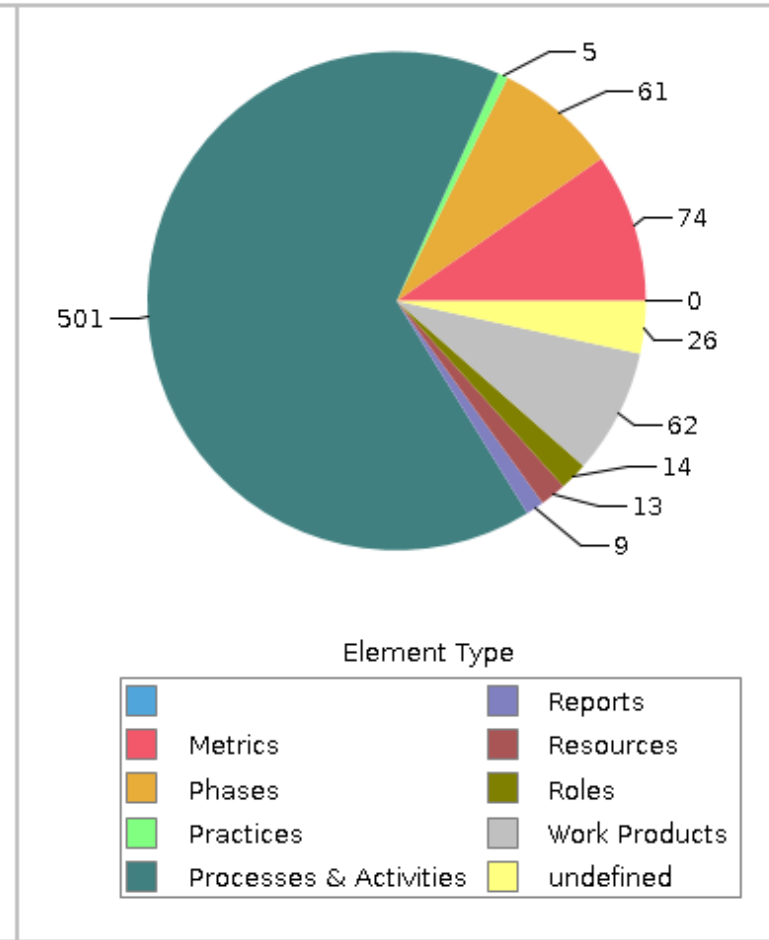
Reference Model	Scope	PA	Goal	ID	Requirement Name	Workspace Name	Process Version	Process Element Typ	Process Element
Automotive SPICE 3.0	SWE.2: Architectural Design (L3)	SWE	SWE.2	SWE.2.BP9	Communicate agreed software archit	Automotive Generic Engineering Prc	Working revision	Activity	Approve Software Architectural Design
Automotive SPICE 3.0	SWE.2: Architectural Design (L3)	SWE	SWE.2	SWE.2.BP9	Communicate agreed software archit	Automotive Generic Engineering Prc	Working revision	Work Product	Software Architectural Design Specification
Automotive SPICE 3.0	SWE.2: Architectural Design (L3)	SWE	SWE.2	SWE.2.BP8	Ensure consistency [Outcome 1, 2, 5	Automotive Generic Engineering Prc	Working revision	Activity	Verify Software Architectural Design
Automotive SPICE 3.0	SWE.2: Architectural Design (L3)	SWE	SWE.2	SWE.2.BP8	Ensure consistency [Outcome 1, 2, 5	Automotive Generic Engineering Prc	Working revision	Work Product	Software Architectural Design Specification
Automotive SPICE 3.0	SWE.2: Architectural Design (L3)	SWE	SWE.2	SWE.2.BP8	Ensure consistency [Outcome 1, 2, 5	Automotive Generic Engineering Prc	Working revision	Work Product	Software Architectural Design Review Protocol
Automotive SPICE 3.0	SWE.2: Architectural Design (L3)	SWE	SWE.2	SWE.2.BP7	Establish bidirectional traceability [Ou	Automotive Generic Engineering Prc	Working revision	Activity	Create Software Architectural Design
Automotive SPICE 3.0	SWE.2: Architectural Design (L3)	SWE	SWE.2	SWE.2.BP7	Establish bidirectional traceability [Ou	Automotive Generic Engineering Prc	Working revision	Work Product	Software Architectural Design Specification
Automotive SPICE 3.0	SWE.2: Architectural Design (L3)	SWE	SWE.2	SWE.2.BP7	Establish bidirectional traceability [Ou	Automotive Generic Engineering Prc	Working revision	Work Product	Software Design Traceability Record
Automotive SPICE 3.0	SWE.2: Architectural Design (L3)	SWE	SWE.2	SWE.2.BP6	Evaluate alternative software architec	Automotive Generic Engineering Prc	Working revision	Activity	Create Software Architectural Design
Automotive SPICE 3.0	SWE.2: Architectural Design (L3)	SWE	SWE.2	SWE.2.BP6	Evaluate alternative software architec	Automotive Generic Engineering Prc	Working revision	Work Product	Software Architectural Design Specification
Automotive SPICE 3.0	SWE.2: Architectural Design (L3)	SWE	SWE.2	SWE.2.BP5	Define resource consumption objectiv	Automotive Generic Engineering Prc	Working revision	Activity	Create Software Architectural Design
Automotive SPICE 3.0	SWE.2: Architectural Design (L3)	SWE	SWE.2	SWE.2.BP5	Define resource consumption objectiv	Automotive Generic Engineering Prc	Working revision	Work Product	Software Architectural Design Specification
Automotive SPICE 3.0	SWE.2: Architectural Design (L3)	SWE	SWE.2	SWE.2.BP4	Describe dynamic behavior [Outcom	Automotive Generic Engineering Prc	Working revision	Activity	Create Software Architectural Design
Automotive SPICE 3.0	SWE.2: Architectural Design (L3)	SWE	SWE.2	SWE.2.BP4	Describe dynamic behavior [Outcom	Automotive Generic Engineering Prc	Working revision	Work Product	Software Architectural Design Specification
Automotive SPICE 3.0	SWE.2: Architectural Design (L3)	SWE	SWE.2	SWE.2.BP3	Define interfaces of software element	Automotive Generic Engineering Prc	Working revision	Activity	Create Software Architectural Design
Automotive SPICE 3.0	SWE.2: Architectural Design (L3)	SWE	SWE.2	SWE.2.BP3	Define interfaces of software element	Automotive Generic Engineering Prc	Working revision	Work Product	Software Architectural Design Specification
Automotive SPICE 3.0	SWE.2: Architectural Design (L3)	SWE	SWE.2	SWE.2.BP2	Allocate software requirements [Outc	Automotive Generic Engineering Prc	Working revision	Activity	Create Software Architectural Design
Automotive SPICE 3.0	SWE.2: Architectural Design (L3)	SWE	SWE.2	SWE.2.BP2	Allocate software requirements [Outc	Automotive Generic Engineering Prc	Working revision	Work Product	Software Architectural Design Specification
Automotive SPICE 3.0	SWE.2: Architectural Design (L3)	SWE	SWE.2	SWE.2.BP1	Develop software architectural desig	Automotive Generic Engineering Prc	Working revision	Activity	Create Software Architectural Design
Automotive SPICE 3.0	SWE.2: Architectural Design (L3)	SWE	SWE.2	SWE.2.BP1	Develop software architectural desig	Automotive Generic Engineering Prc	Working revision	Work Product	Software Architectural Design Specification

Analytics

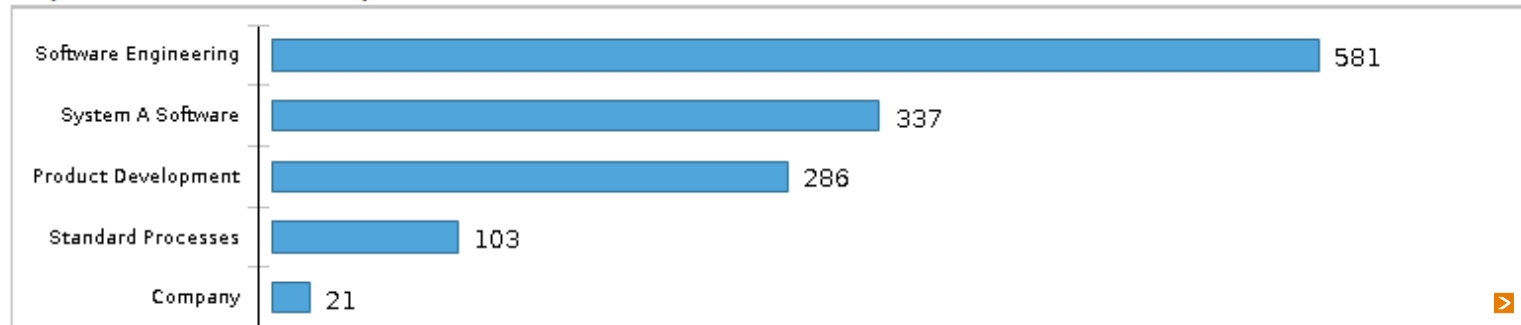
Process Usage



Usage per Type



Top 10 Active Workspaces



Process Tailoring Hotspots

Process Area	Process	Phases			Processes & Activities			Work Products			Roles			Metrics			Practices			
		#Tail	#All	%	#Tail	#All	%	#Tail	#All	%	#Tail	#All	%	#Tail	#All	%	#Tail	#All	%	
Change Management	OTHER	0	0	0	0	5	0	0	1	0	0	2	0	0	0	0	0	0	0	
Configuration Management	OTHER	0	4	0	0	5	0	0	3	0	0	2	0	0	0	0	0	0	0	
Electronics Design	OTHER	0	6	0	3	7	42.9	0	4	0	0	2	0	0	0	0	0	11	0	
OTHER	OTHER	0	28	0	0	0	0	5	66	7.6	1	25	4	0	6	0	3	58	5.2	
Project Management	Decision Management	0	0	0	0	4	0	0	1	0	0	1	0	0	0	0	0	0	1	0
	OTHER	0	8	0	2	7	28.6	2	5	40	0	2	0	0	1	0	0	0	0	
	Project Assessment and Control	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Project Planning	0	1	0	0	5	0	0	5	0	0	1	0	0	0	0	0	0	0	0
	Risk Management	0	1	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Quality Management	OTHER	0	1	0	0	3	0	0	2	0	0	1	0	0	0	0	0	0	0	
Release Management	OTHER	0	1	0	0	4	0	0	1	0	0	4	0	0	0	0	0	0	0	
Requirements Management	OTHER	0	3	0	4	4	100	1	4	25	0	2	0	0	0	0	1	5	20	
Safety Management	OTHER	0	0	0	3	3	100	2	2	100	1	1	100	0	0	0	0	0	0	
Stakeholder Requirements Definition	OTHER	0	1	0	0	12	0	0	5	0	0	2	0	0	1	0	0	5	0	
Supporting Activities	OTHER	0	0	0	0	2	0	0	2	0	0	2	0	0	0	0	0	0	0	
System Architectural Design	OTHER	0	2	0	0	12	0	0	5	0	0	2	0	0	0	0	0	10	0	
System Implementation	OTHER	0	1	0	0	5	0	0	3	0	0	3	0	0	0	0	0	0	0	
System Integration	OTHER	0	1	0	0	8	0	0	3	0	0	3	0	0	0	0	0	2	0	
System Requirements Analysis	OTHER	0	1	0	0	10	0	0	5	0	0	3	0	0	0	0	0	9	0	
System Validation	OTHER	0	3	0	0	6	0	0	2	0	0	2	0	0	0	0	0	0	0	
System Verification	OTHER	0	3	0	0	6	0	0	3	0	0	2	0	0	0	0	0	2	0	
Verification & Validation	Component Test	0	3	0	1	4	25	0	3	0	0	1	0	0	0	0	0	0	0	
	Functional Test	0	4	0	0	4	0	0	3	0	0	1	0	0	0	0	0	0	0	
	Integration Test	0	3	0	0	4	0	0	3	0	0	1	0	0	0	0	0	0	0	
	OTHER	0	3	0	0	3	0	0	2	0	0	2	0	0	0	0	0	0	0	
	Software Validation	0	4	0	0	4	0	0	3	0	0	1	0	0	0	0	0	0	0	
	System Test	0	2	0	0	2	0	0	1	0	0	1	0	0	0	0	0	0	0	

Some Results

Process Excellence in Practice

General Motors

Reduced involved engineering tools from >400 to <80

Ford

Determined which tools are relevant for functional safety certification and which are not

Bosch

Reduced process change turnaround time by configuring IBM Team Concert workflows through the defined processes

Siemens Healthineers

Simplified cross-functional process flows by about %35

Thales Railway Systems

Reduced audit preparation efforts by >50%
(being subject to ~50 audits per year!)

Honeywell

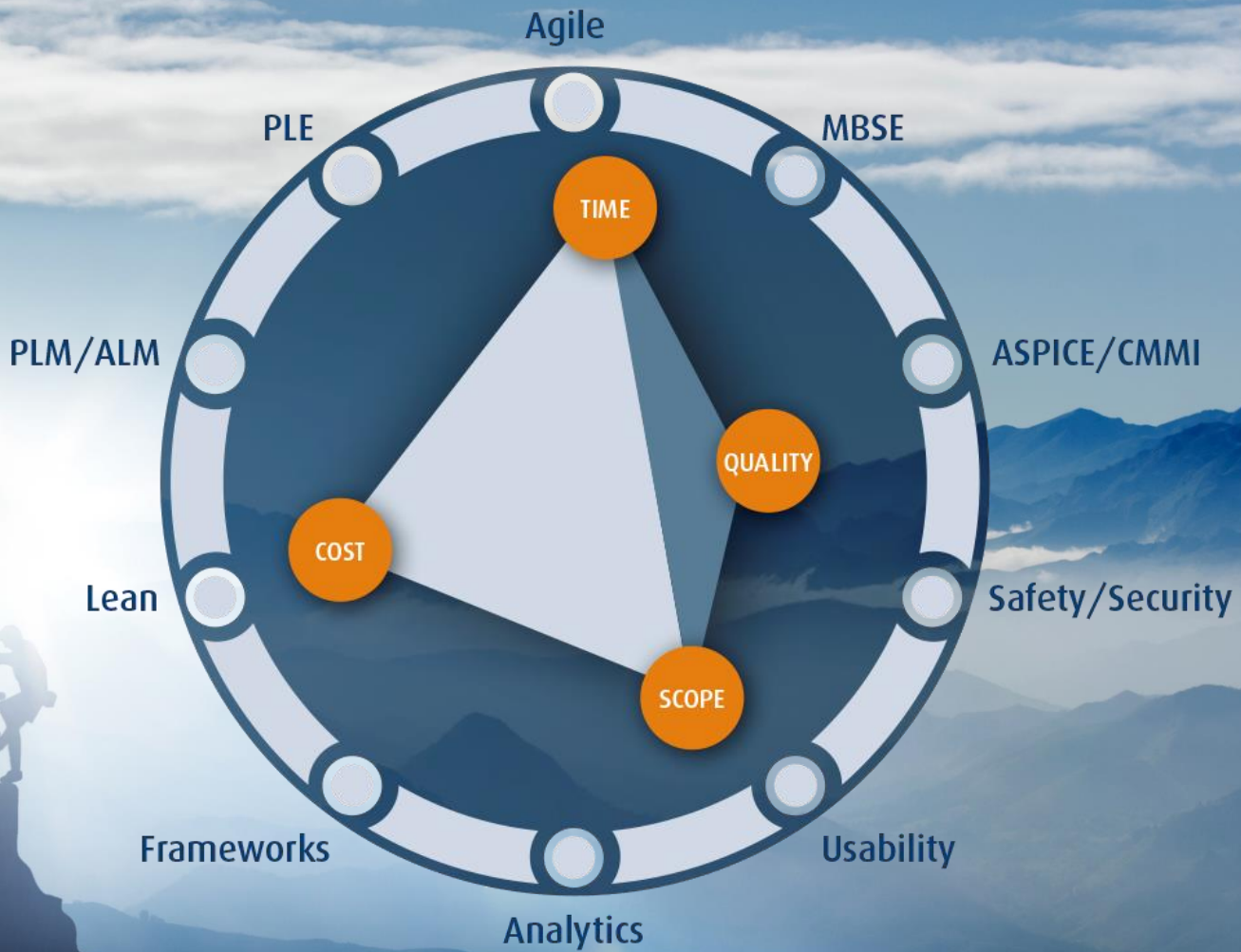
THE POWER OF **CONNECTED**

Accomplishments

- ✓ Production & QA Environment established
 - ✓ Aero Enterprise Stages License acquired
- ✓ Incorporated >95% of E&T Command Media
 - ✓ ~65% Reduction in Aero Procedures
- ✓ Several thousand unique users to date
- ✓ Feedback & Review developed
 - ✓ 1000's Feedback processed
 - ✓ Age / Responsiveness improved 4x



Process Excellence





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www.methodpark.com/stages