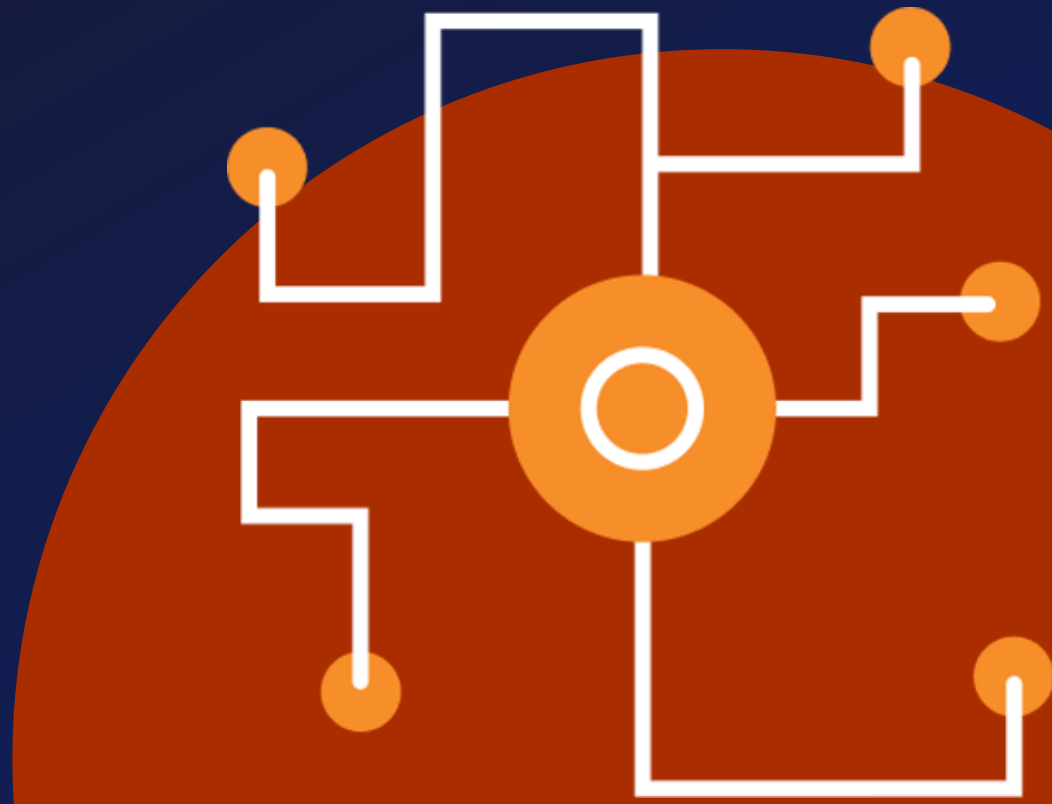
IIBA NETHERLANDS

Requirements Management: Building the foundation of Product Development Success



Jama software®

Our Speaker

COLIN WHITE

Senior Business Consultant

Jama Software

Agenda

- Overview of Requirements Management
- Requirements Tracing
- Requirements Management in different Industries
- Ideas for success with requirements
- Q&A

Requirements Management

So… What are requirements?

What are requirements?

A DEFINITION

1) What a system must do (a functional requirement)

2) A known limitation on the design or resources available (a constraint)

3) How well the system must do its job (a quality or performance level)

Requirements are the foundation on which systems are built

A **requirement** is a statement that identifies a product or processes operational, functional, or design characteristic or constraint, which is unambiguous, testable, or measurable and necessary for product or process acceptability

(ISO 2007)

Why Requirements?

"The requirements which form the design input establish a basis for performing subsequent tasks and validating the design. Therefore, ***development of a solid foundation of requirements is the single most important design control activity.***"

"If essential requirements are not identified…***expensive redesign and rework*** may be necessary before a design can be released to production."

"…the experience of companies that have designed devices using clear-cut, comprehensive sets of requirements is that ***rework and redesign are significantly reduced, and product quality is improved***."

- FDA, Design Control Guidance for Medical Device Manufacturers, 1997

Terminology: Who, What, How, When & Why

Business Case	•Documents the **value** of solving the problem •Identifies the market and potential customers (**who**) •May identify constraints on the system such as cost or timescale (**when**) •**Evolves** with the requirements and specifications as the design is revealed
Context	•Explains **why** we are solving the problem •Includes customer journeys, user stories, problem statements, market research, competitive analysis and more •Is a precursor to requirements
Requirements	•Represent the **problem** we are trying to solve •Describe **what** the system we are building must do •Drive design choices
Design	•Are a **response** to the requirements •Describe **how** we are solving the problem •Document our design choices

Requirement Templates

[Trigger]	[Precondition]	Actor	Action	[Object]
When a collision is detected	and the passenger airbag switch is on	the system	SHALL detonate	the passenger airbags

User	Need	Reason / Purpose	Objective
As a picker	I need the target object highlighted	so that I can find and pack it	within 3 seconds of identifying item

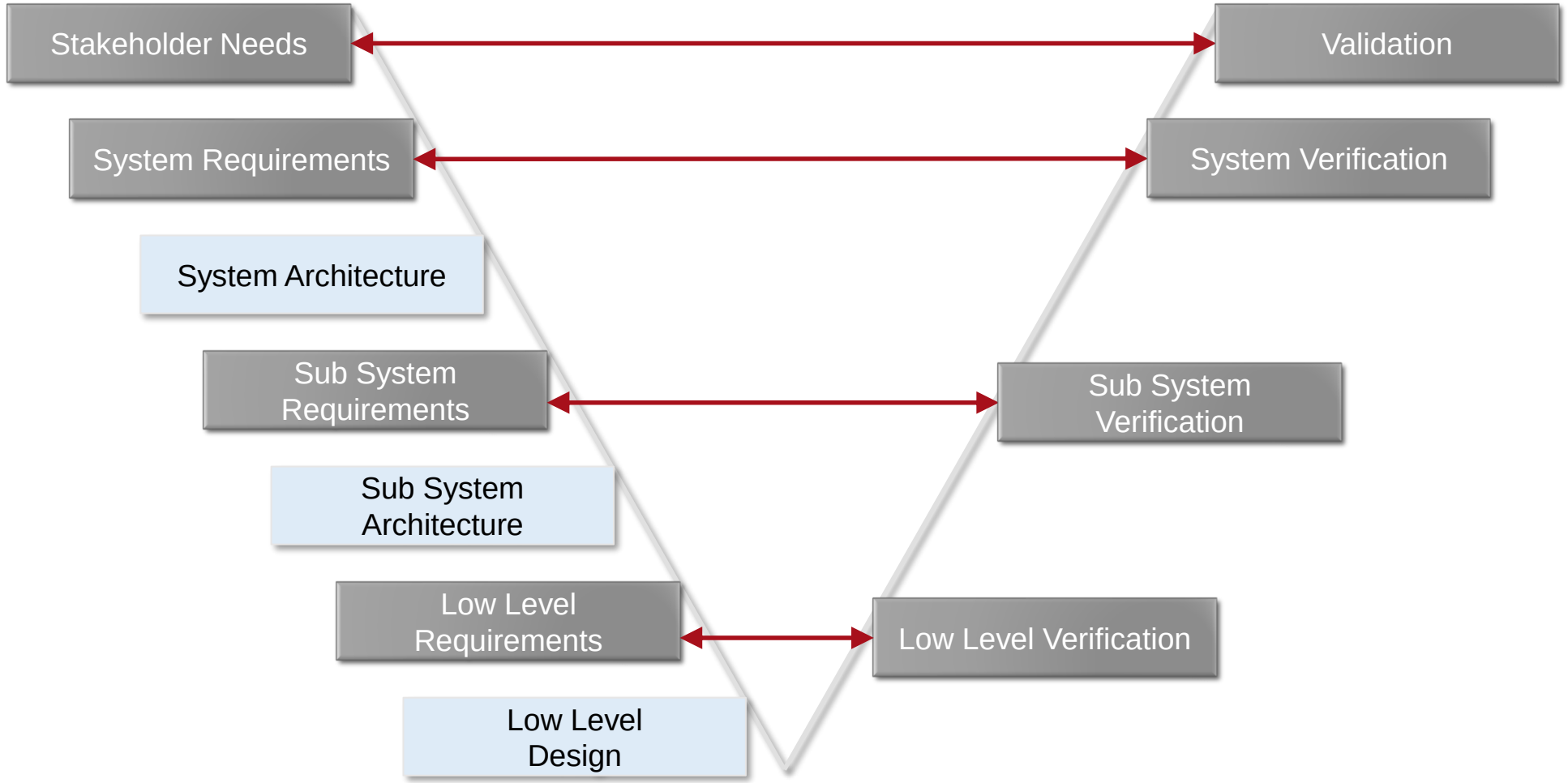
[Example in Jama Connect]

Requirements Tracing

Links & Relationships to manage Requirements

Managing Complexity

ONE GOOD REQUIREMENT LEADS TO ANOTHER…



Good Practices for Traceability

USING TRACE TO IMPROVE

- Build a framework to link artifacts
- Connect people as well as data
- Determine gaps in the traceability
- Identify and manage change impact across your project
- Understand how features are connected

[Example in Jama Connect]

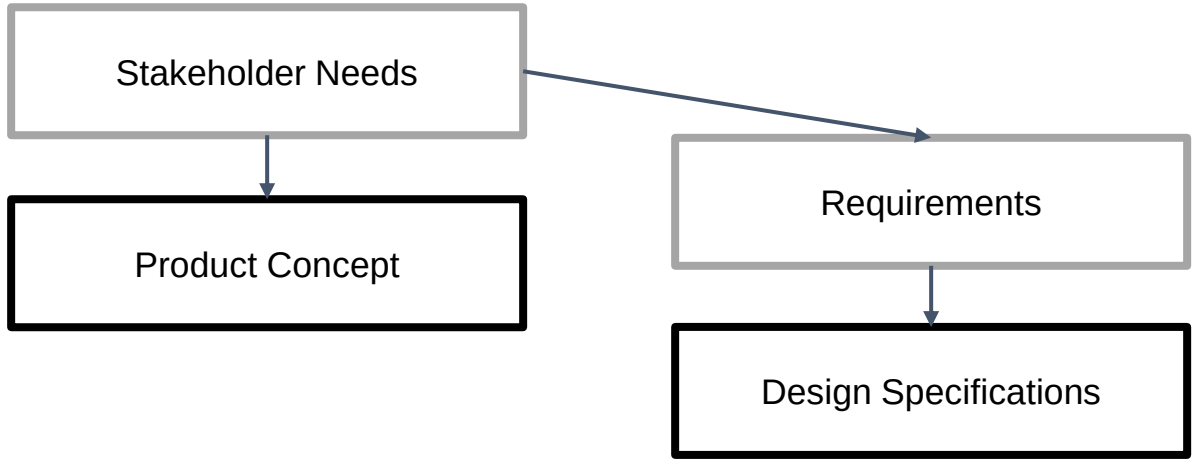
Requirements Management Styles

Requirements across different industries

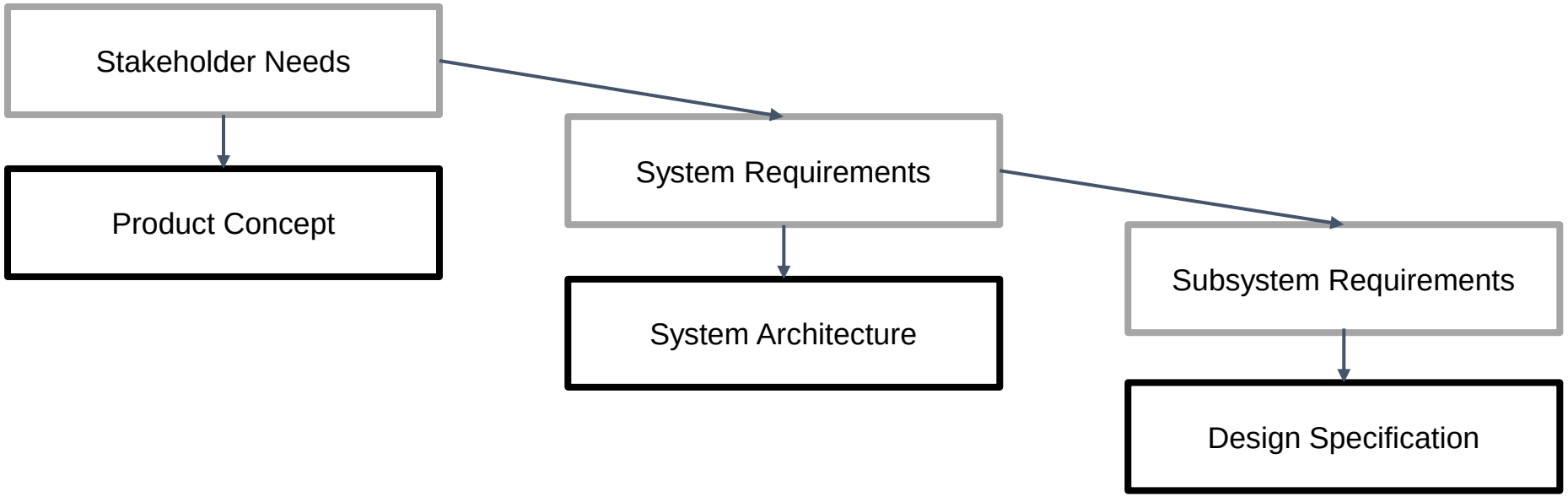
Some Principles

BASICS APPLY EVERYWHERE

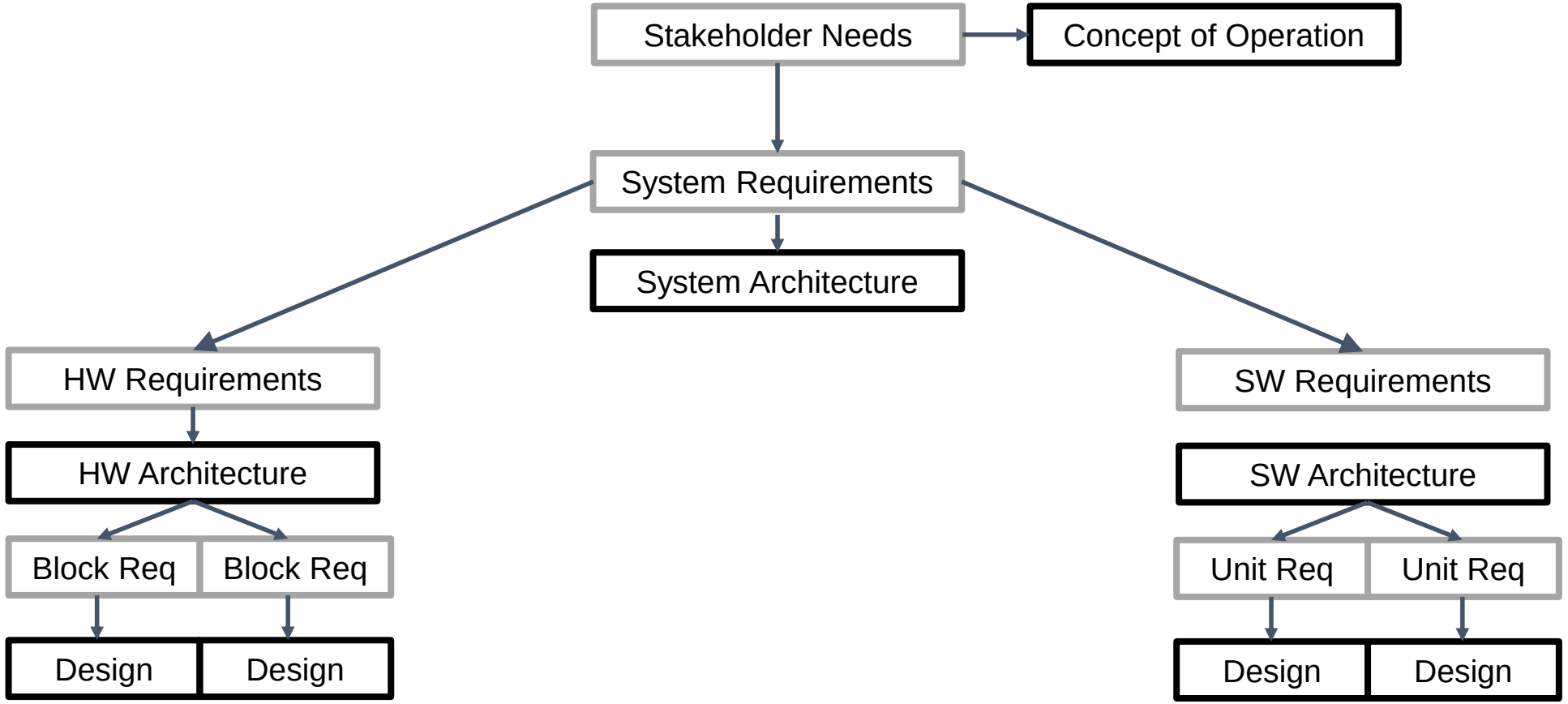
- All industries work slightly differently!
- Any process we build needs to be useable by the engineers and team members
- Some examples:
- ‘Software’:
  - Just ‘one discipline’
  - High Cadence of Change
- ‘Aerospace’:
  - ‘Systems of Systems’ – many teams and disciplines
  - High Complexity, Each discipline has different Cadence of Change



Establish a clear requirements hierarchy.



Add hierarchy if needed.



Building a system? Add more hierarchy.

[Example in Jama Connect]

Requirements Tips and Tricks

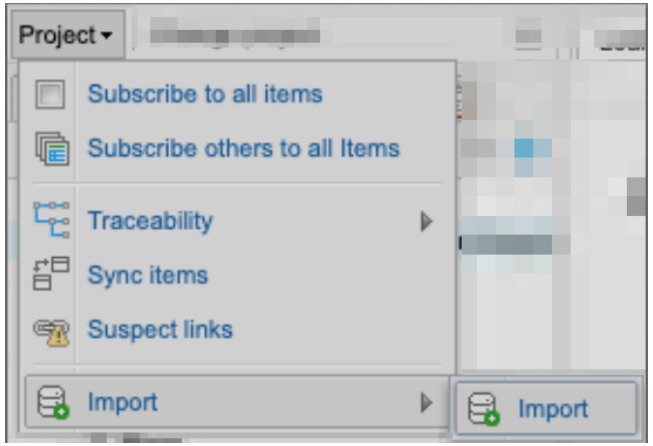
Applying Requirements Management

How to Get Started

DESIGNING ‘ITEMS’

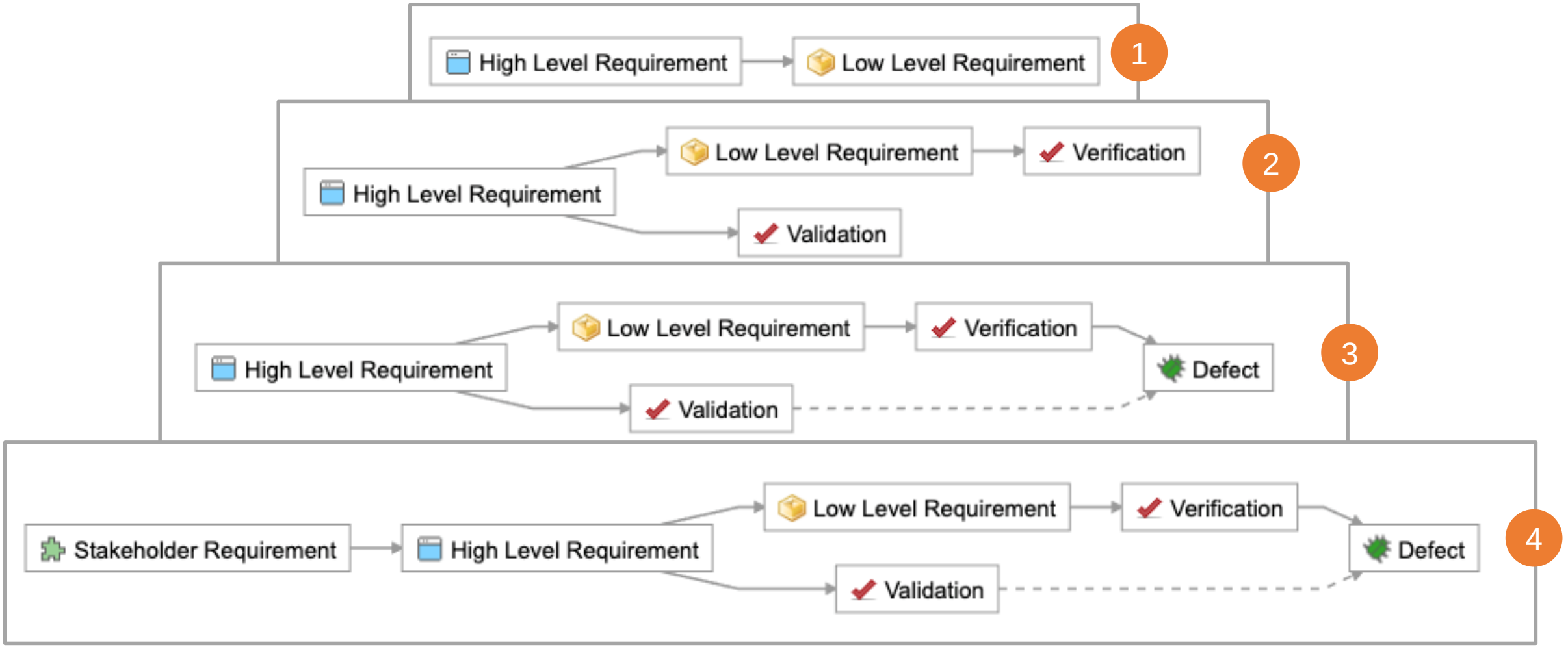
- Start by getting data into Jama Connect
- It is possible to work without knowing how the end will look
- Over time, vocabulary will become consistent
- Filters and reports can be used to spot wrinkles
- Items can change as the needs of the engineers and the project itself changes

Order	Label	Field Name
1	Project ID	Document Key
2	Name	Name
3	Description	Description
4	Rationale	Rationale
5	Status	Status



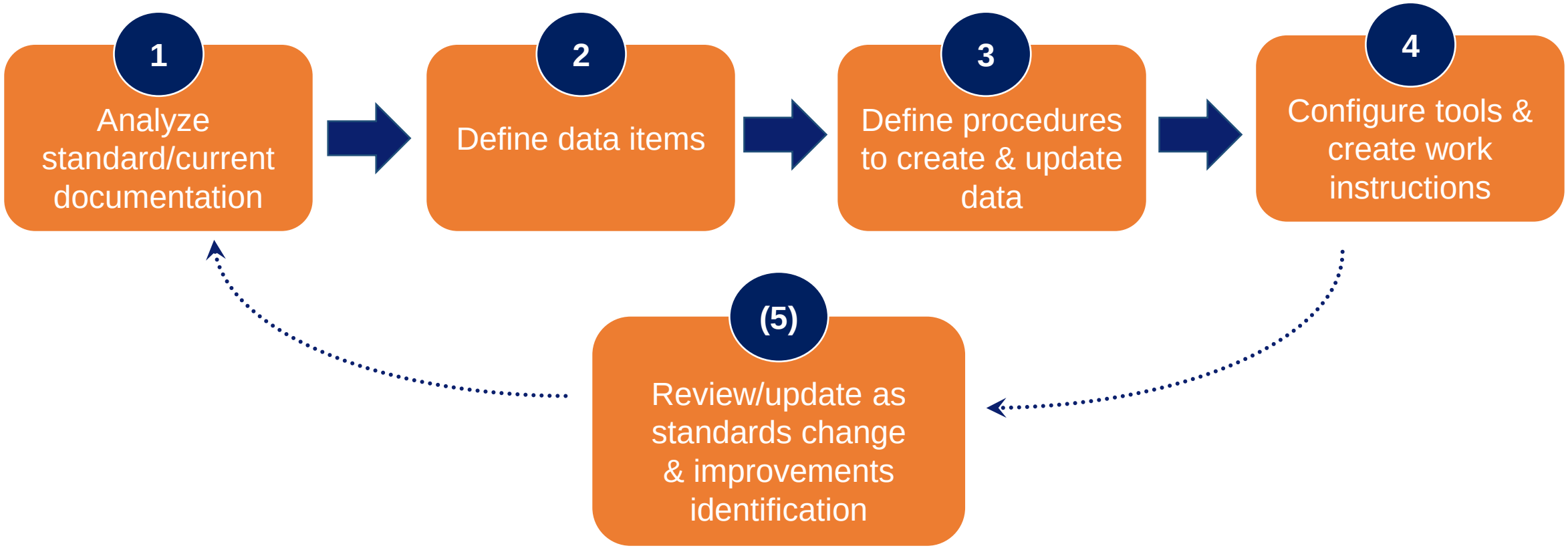
How to Build Your Process

EXPANDING THE DATA MODEL



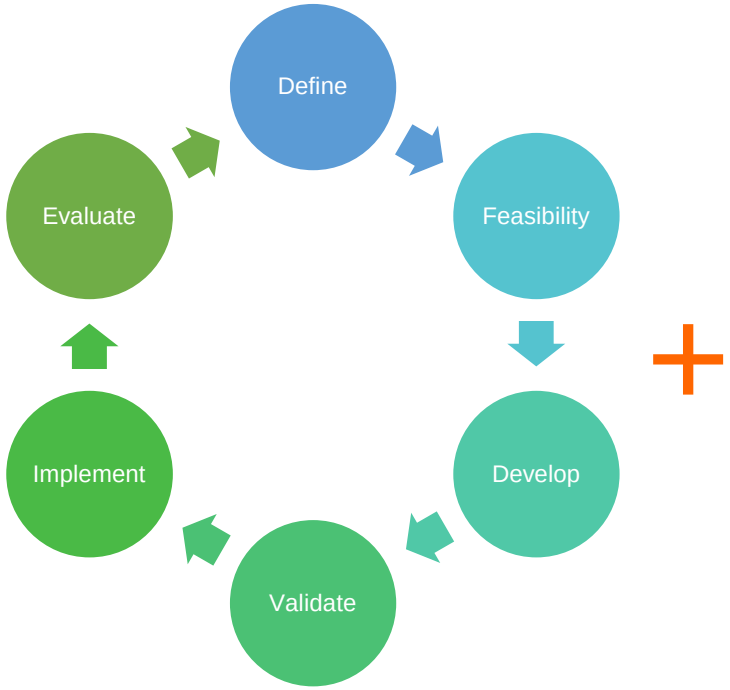
Gaining Compliance

FROM STANDARDS TO PROCESSES & PRACTICES



Use metrics to improve visibility & quality

DEFINE, MEASURE, DISPLAY, IMPROVE



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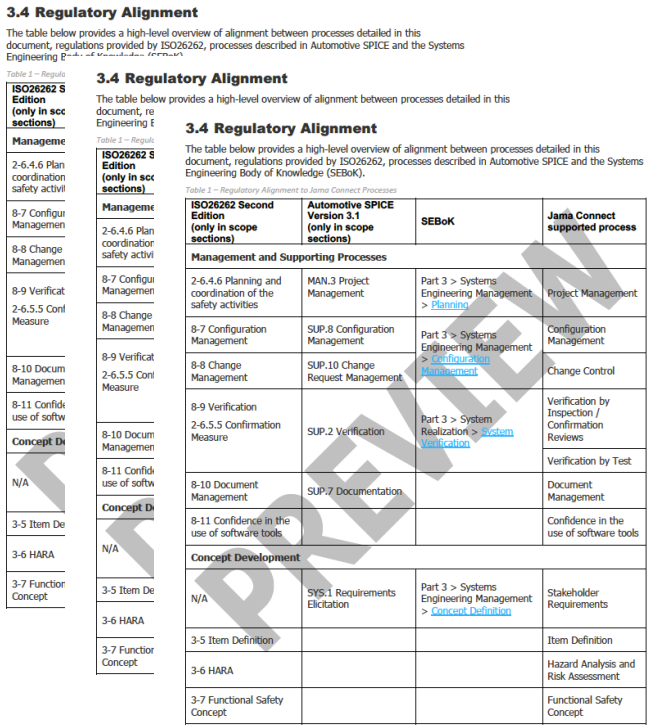

3.4 Regulatory Alignment

The table below provides a high-level overview of alignment between processes detailed in this document, regulations provided by ISO26262, processes described in Automotive SPICE and the Systems Engineering Body of Knowledge (SEBoK).

Table 1 – Regulatory Alignment to Jama Connect Processes

ISO26262 Second Edition (only in scope sections)	Automotive SPICE Version 3.1 (only in scope sections)	SEBoK	Jama Connect supported process
Management and Supporting Processes			
2-6.4.6 Planning and coordination of the safety activities	MAN.3 Project Management	Part 3 > Systems Engineering Management > Planning	Project Management
8-7 Configuration Management	SUP.8 Configuration Management	Part 3 > Systems Engineering Management > Configuration Management	Configuration Management
8-8 Change Management	SUP.10 Change Request Management		Change Control
8-9 Verification 2-6.5.5 Confirmation Measure	SUP.2 Verification	Part 3 > System Realization > System Verification	Verification by Inspection / Confirmation Reviews
			Verification by Test
8-10 Document Management	SUP.7 Documentation		Document Management
8-11 Confidence in the use of software tools			Confidence in the use of software tools
Concept Development			
N/A	SYS.1 Requirements Elicitation	Part 3 > Systems Engineering Management > Concept Definition	Stakeholder Requirements
3-5 Item Definition			Item Definition
3-6 HARA			Hazard Analysis and Risk Assessment
3-7 Functional Safety Concept			Functional Safety Concept

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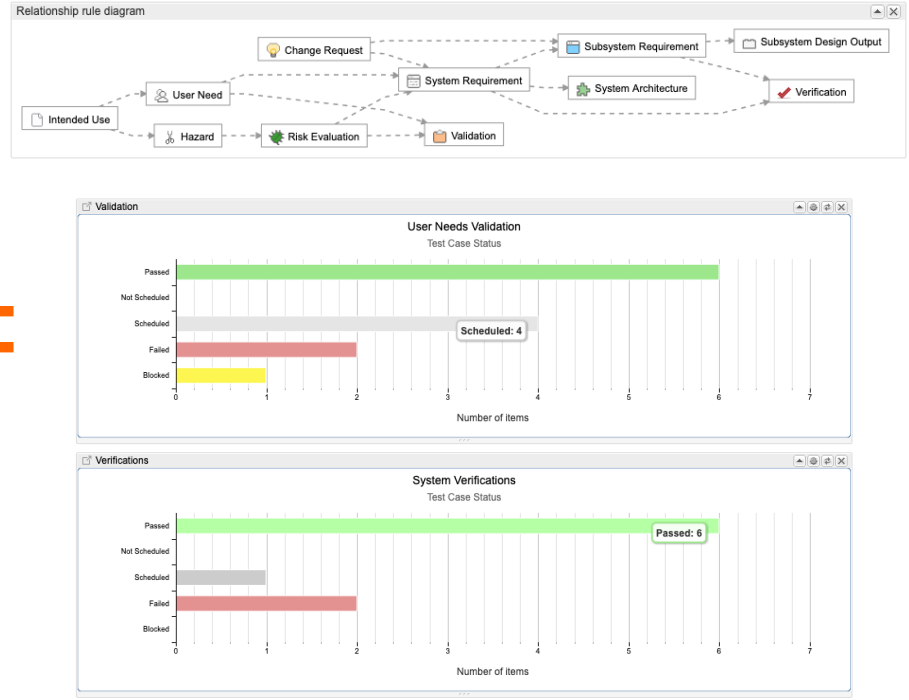
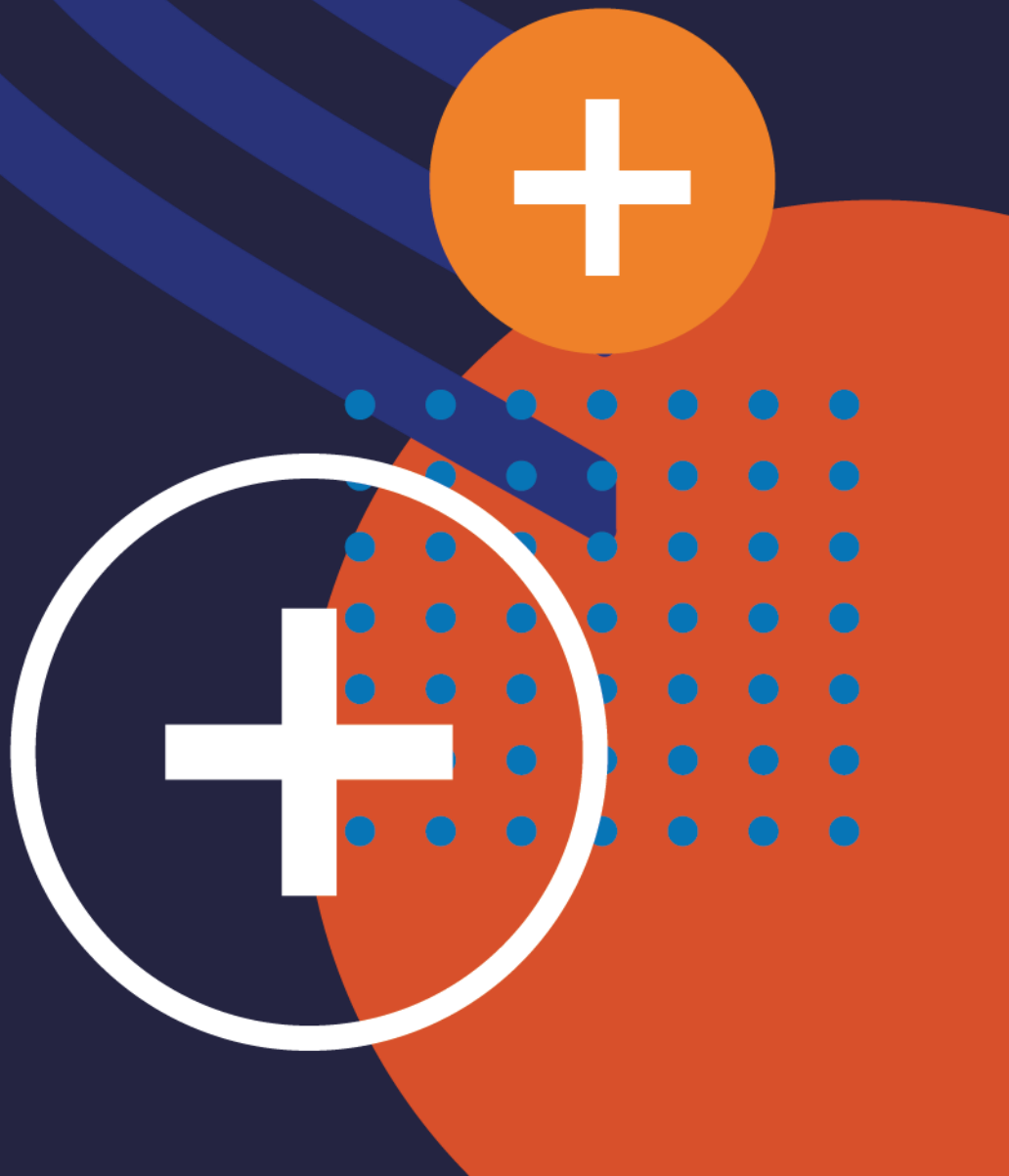


Key Takeaways

REQUIREMENTS ARE THE FOUNDATION OF ANY PRODUCT

- Good products are built on good requirements
- Use templates & levels to improve requirements
- Use traceability between people and data to find and address gaps
- Adopt organization specific rules and processes
- Define & operate a process
- Be prepared to adapt and Improve those processes
- Get started!

Q&A



Thank You!

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