Continuous Integration
Sprint 6

Agneta Nilsson, Jan Bosch, & Christian Berger
How can we identify, prioritize, and select suitable improvement initiatives more efficiently in order to support the advancement towards continuous integration?
The CIVIT Model, updated

Customer
Release
Full Product
Partial Product
Subsystem
Component

Improvement Directions

Once /release | Month | Week Minutes | Day | Hour | Immediate/
Continuous Integration Improvement Method

1. Visualization (CIVIT)
2. Identification, prioritization, and selection
3. Implementation
4. Evaluation
Systematic way of doing the change?
Low hanging fruit...

Help apply CItIM model on the situation to see how we do the selection. But before doing the selection, we should identify - what can we do?
Identified themes

- Link between requirements and testing
- Maturity of test environment
- System level testing
- The product family perspective
- Suppliers and the 25x problem
- Variability in testing
- Cost of maintaining a CI environment vs taking the normal hit in unpredictability at the end
Role of requirements in relation to tests: Waste or value?

Link between requirements and testing
“We need to learn how to test with unstable requirements, and how to deal with increasing workload and complexity”
Instabilities of tests due to...

- Managing trust in test results
- Managing variance in target and test equipment
- Maintenance of tests and test platforms
System level testing

- Very complex
- Very unpredictable behavior
- Unreliable testing tools
- Scarce resources, competent personnel
- Attitudes/mindsets personnel/organization
- Need to prioritize tests to support CI
Integration & verification
It's fundamental to first understand what are we actually trying to do!

“- don't have the time to jump on the bike because you're so stressed to get moving”
Documents vs Structured Information

“I like to think of it as moving the organization from a script where you have all these go-to in the code to an object oriented part where you just have instances that communicate with each other on a very simple level. And you hide all the complexity away.”
“we could sell a truck that is actually not verified, but we can't sell a truck that is not integrated”
Data-Driven instead of processes

“An organization thinking in data instead of processes has an enormous advantage because it will focus on what's actually being done, instead of focusing on guarding business processes, protecting the budgets etc. which become extremely hard to change because of all these boundaries.”
From Requirements to Test

- During the course of a project, requirements transition to test cases
- The formalization of requirements into test cases is a form of requirements elicitation and specification
From Requirements to Test

- Depending on the level in the CiViT model, requirements might transition faster/easier to test cases.
- Depending on the test environment (unit test, simulation environment, partial test environment), requirements transition faster/easier to test cases.
Reuse of Requirements and Tests

- Companies (e.g. Axis) often define a new product in terms of the delta to an existing product
- That allows for reuse existing requirements and test cases

![Diagram showing reuse of requirements and tests over time]
Different Approaches

- Companies can “formalize” requirements through test cases early or late in the development process.
- Different forces influence the “curve” that companies in different domains use.
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- Further analyses of org & tech impediments from CI
- Risk-based test selection

- Link between requirements and testing
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Axis Communications – Firmware Platform

Customer

Release

Full Product

Partial Product

Subsystem

Component

Once /release Month Week Day Hour Immediate/

Minute

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– What different aspects should be taken into consideration when selecting an improvement initiative?

– How can we assess the advantages, disadvantages, and various tradeoffs involved in the identified initiatives?

– How can we more systematically prioritize and select suitable initiatives in a certain context?