



# AGL Instrument Cluster development process proposal

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# What is Automotive Grade Linux?

Automotive Grade Linux is a collaborative open source project that is bringing together automakers, suppliers and technology companies to accelerate the development and adoption of a fully open software stack for the connected car.

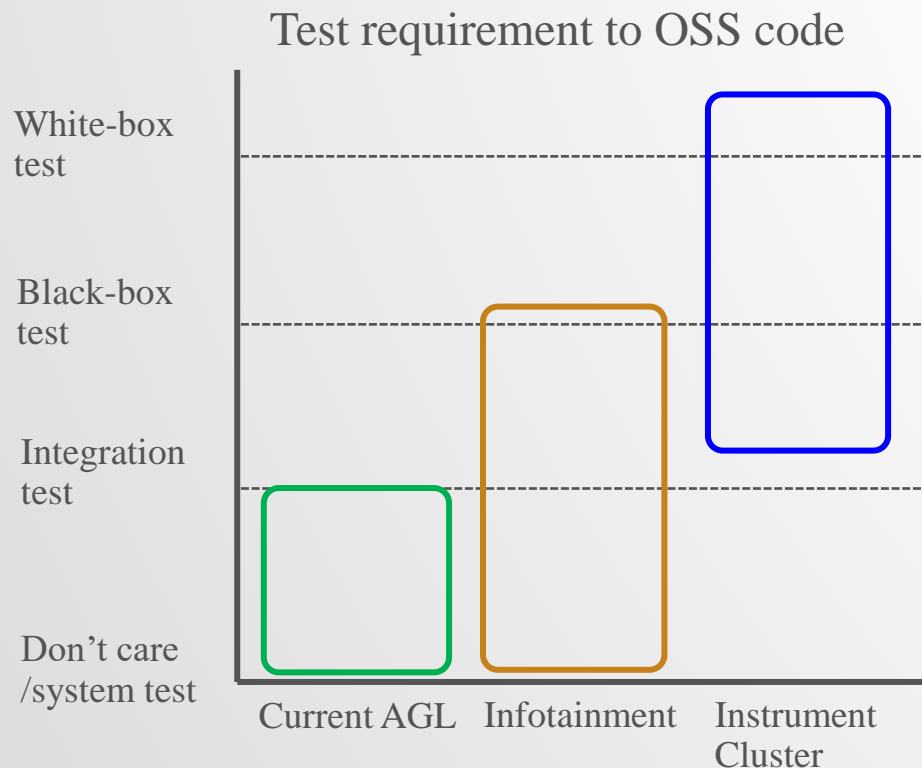
# What is issue

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- Why need development process ?
  - Optimize to development.
- IVI and clusters are different in terms of requirement.
  - The results of the optimization will be different.
- Many automotive industries are using famous OSS in infotainment system.
  - This mean part of existing OSS development process is already accepted by automotive industry in infotainment system quality requirement.
    - Such as linux, glibc, openssl, genivi dlt, android and etc..
    - AGL specific OSS? It's good question.
- But automotive industries use only limited OSS in instrument cluster systems.
  - This mean existing OSS development process is not match in instrument cluster quality requirement.

# What is gap between infotainment and Instrument cluster

- What acceptance method do you use OSS in industry development process?
  - No big gap between current AGL and Infotainment.
  - On the other hand big gap between current AGL and instrument cluster.
  - This information based on Taguchi-san excellent work.



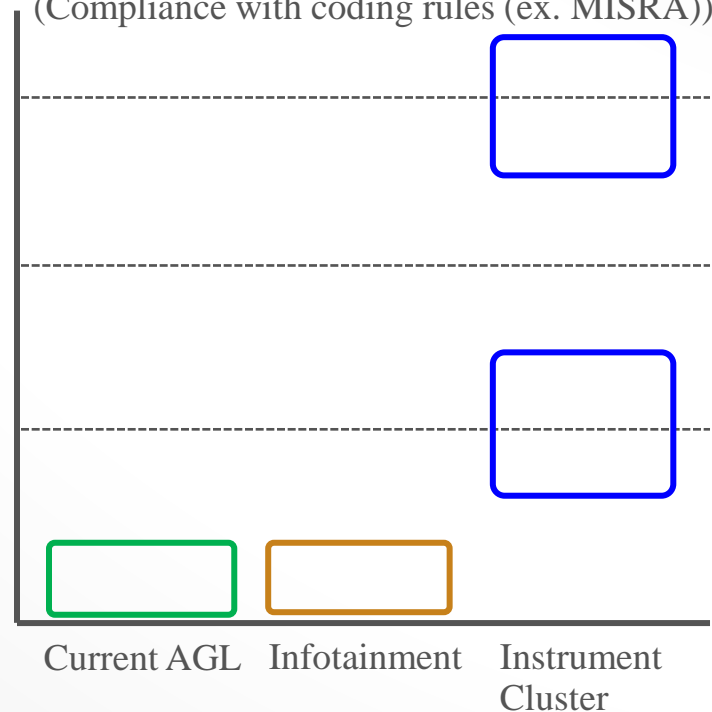
Must conform to industry coding rules.

Static analysis and modify code

Static analysis and leaving evidence

Don't care

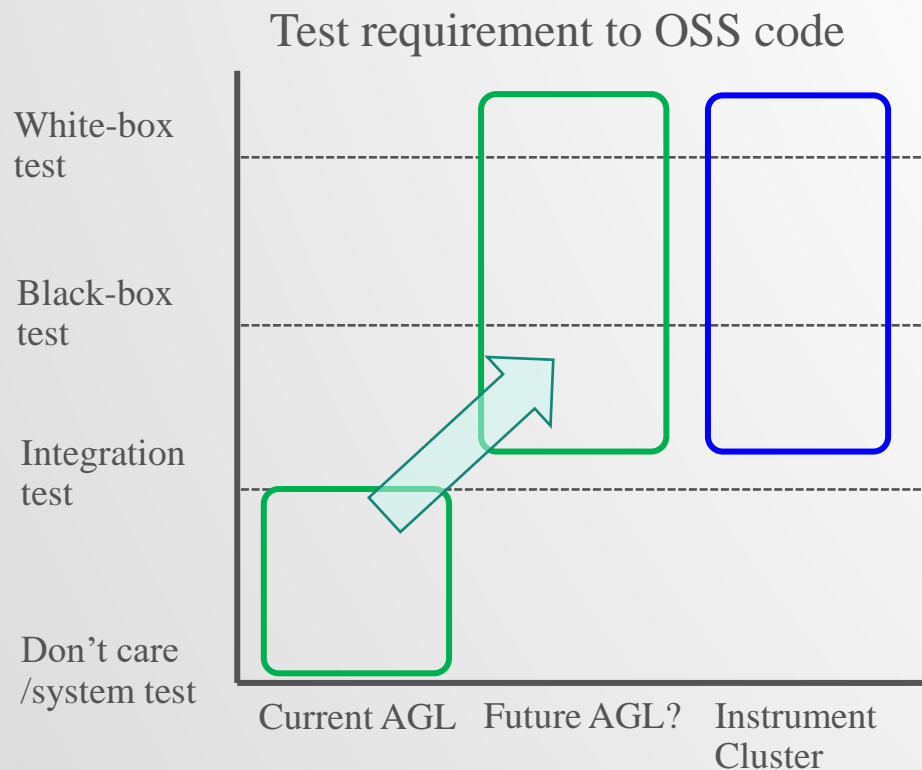
Coding requirement to OSS code  
(Compliance with coding rules (ex. MISRA))



# What is gap between infotainment and Instrument cluster

- What do we aim to achieve ?
  - Test coverage will grow to real product development level ?
  - Coding rule will adopt to real product development level ?

**It's impossible !**



Must conform to industry coding rules.

Static analysis and modify code

Static analysis and leaving evidence

Don't care

Coding requirement to OSS code  
(Compliance with coding rules (ex. MISRA))

# What is important?

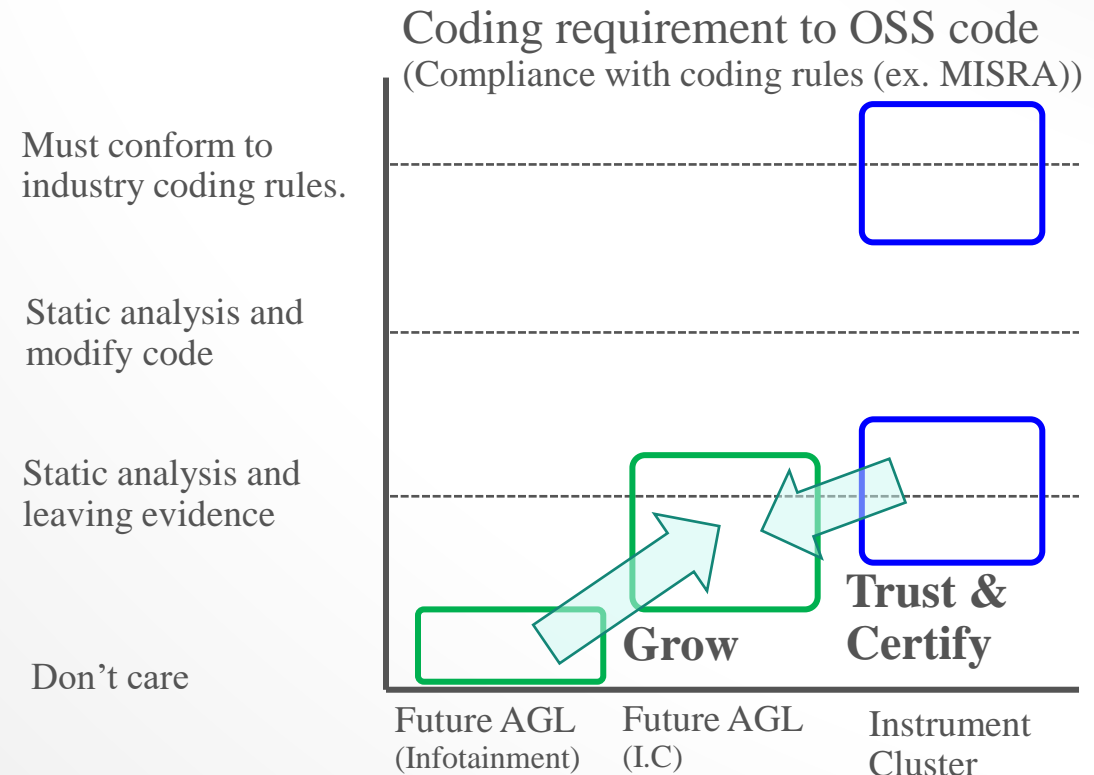
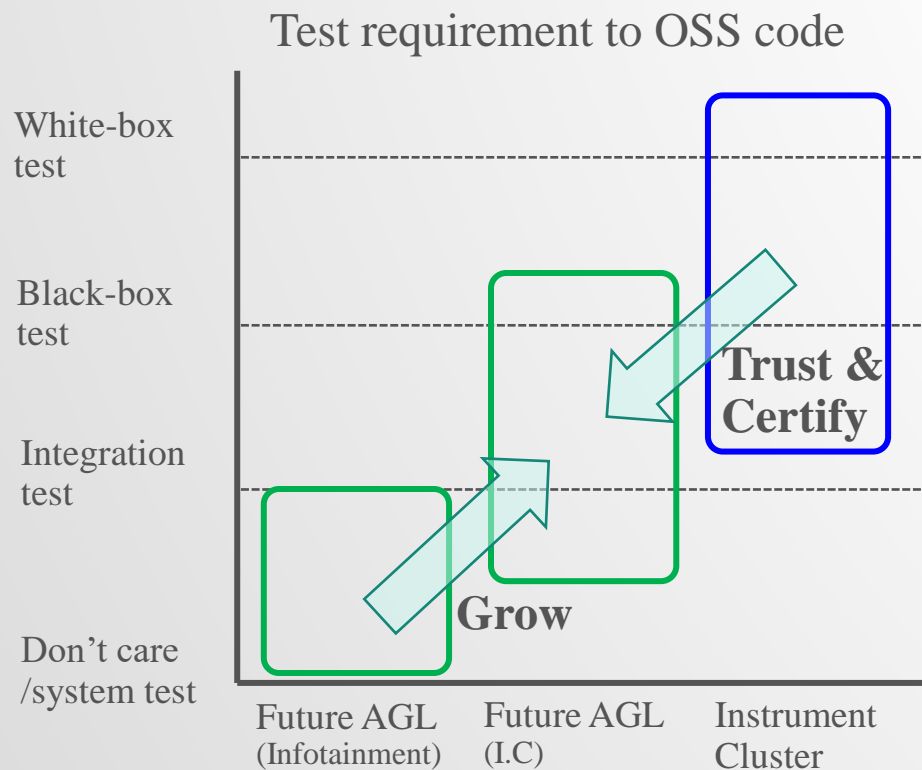
AGL development process for instrument cluster change to existing product development process.

**No!**

**Reduce the gap between the existing OSS development process and the product development process by AGL activity.**

# What is gap between infotainment and Instrument cluster

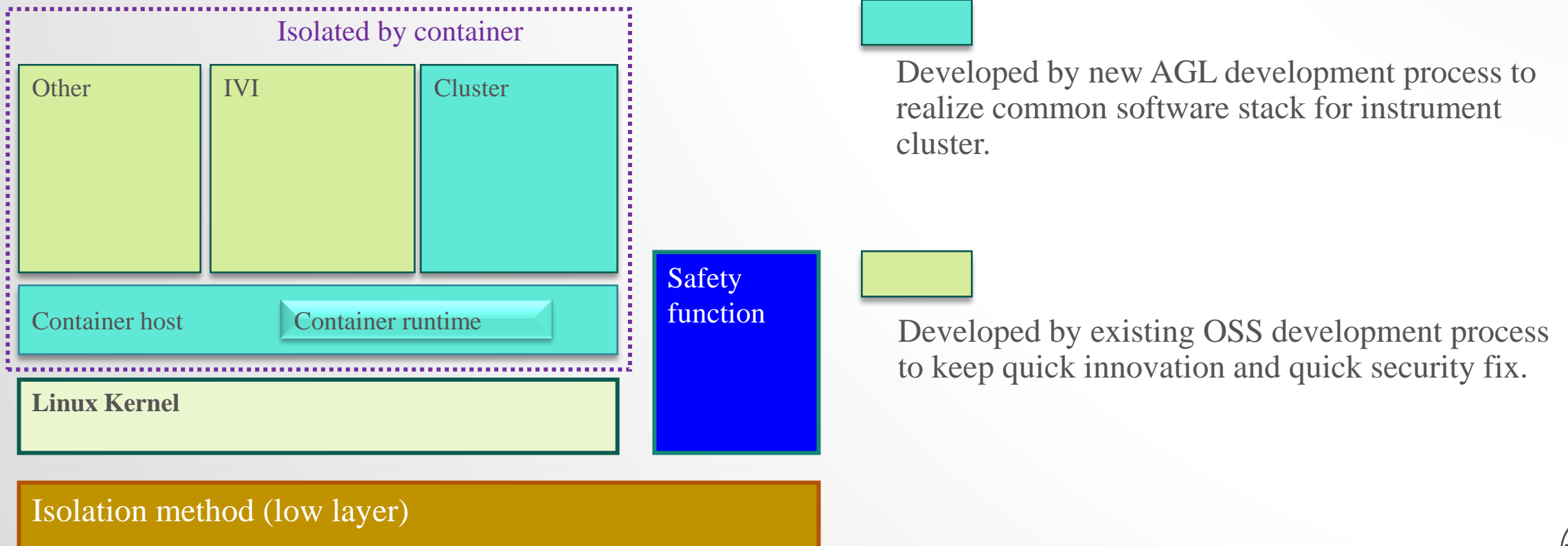
- What do we aim to achieve ?
  - Test coverage will grow to more higher level. Industry will trust and certify to AGL distributed software stack.
  - Coding level will upgrade. Industry will trust and certify to AGL distributed software stack.
- Possible?
  - These challenge are limited to the software stack for the instrument cluster.
  - It's approach of QM Isolation.



# QM Isolation

- Our QM isolation architecture can realize separate software stack based on quality requirement.
- Our development process proposal focus on instrument cluster part.

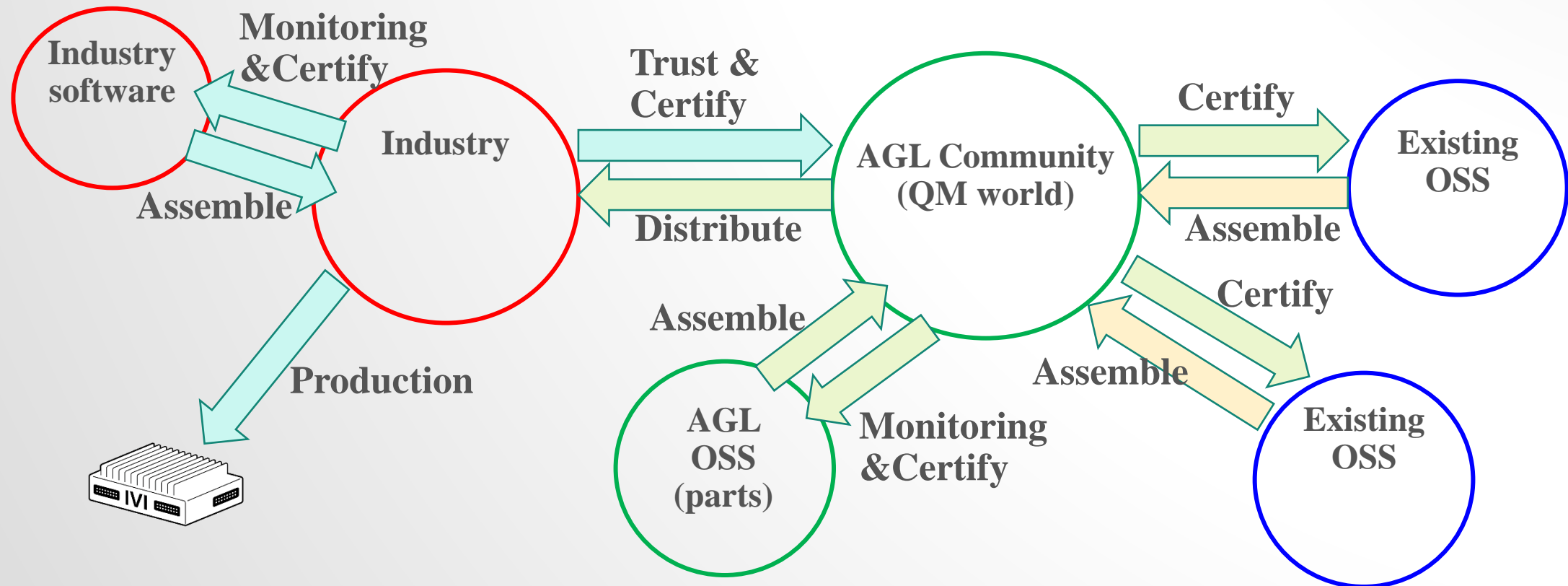
## Abstract architecture





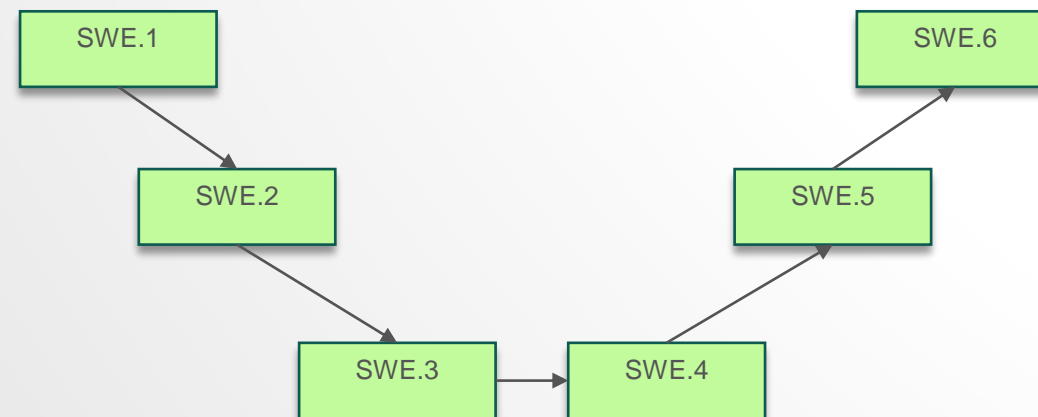
# What we aim

- We want to create workflow from open source development to product development.
  - It wants to be able to certify that it has quality control.
  - It wants to be able to embrace by open source community and industry.



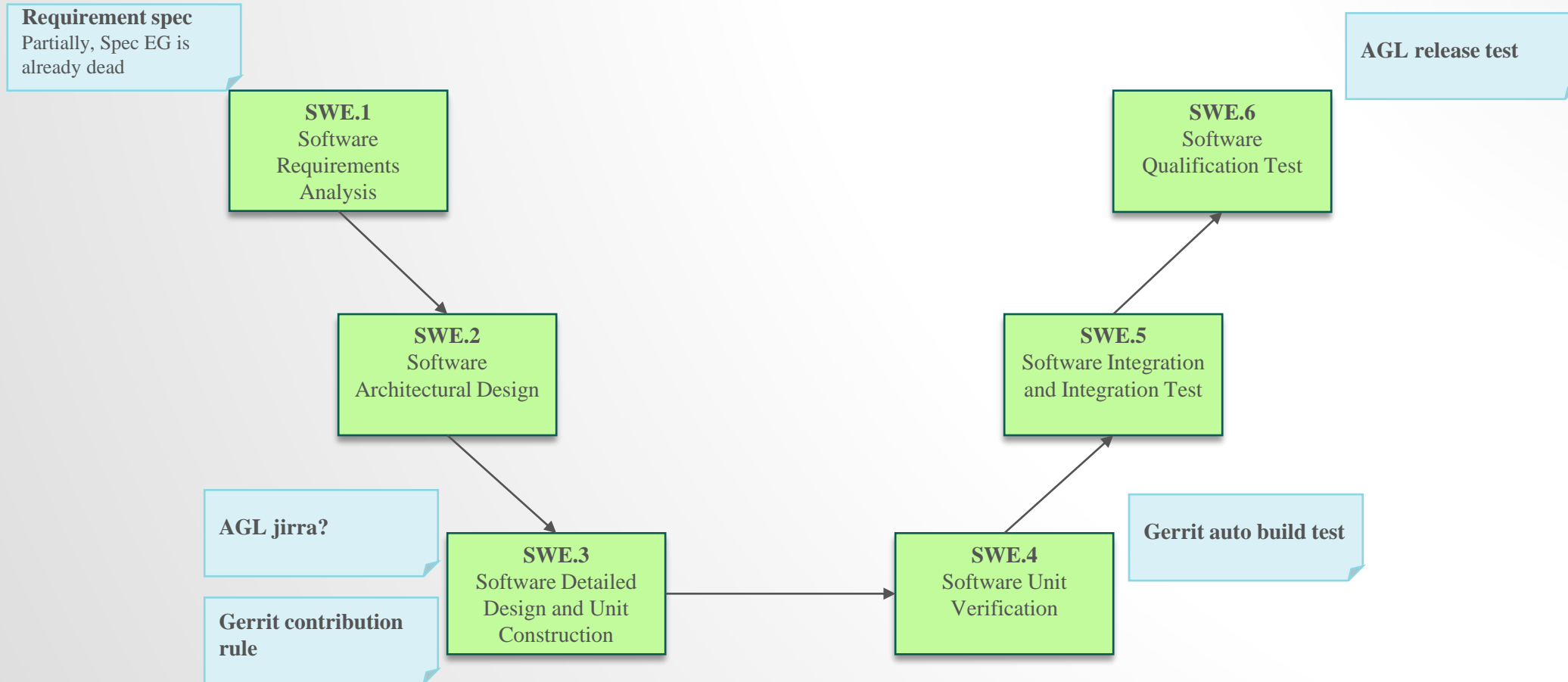
# How to use OSS in V-model?

- V-model is required by automotive standard (ASPICE, ISO26262).
- Automotive software development is a same.
  - SWE.1 Software Requirements Analysis
  - SWE.2 Software Architectural Design
  - SWE.3 Software Detailed Design and Unit Construction
  - SWE.4 Software Unit Verification
  - SWE.5 Software Integration and Integration Test
  - SWE.6 Software Qualification Test



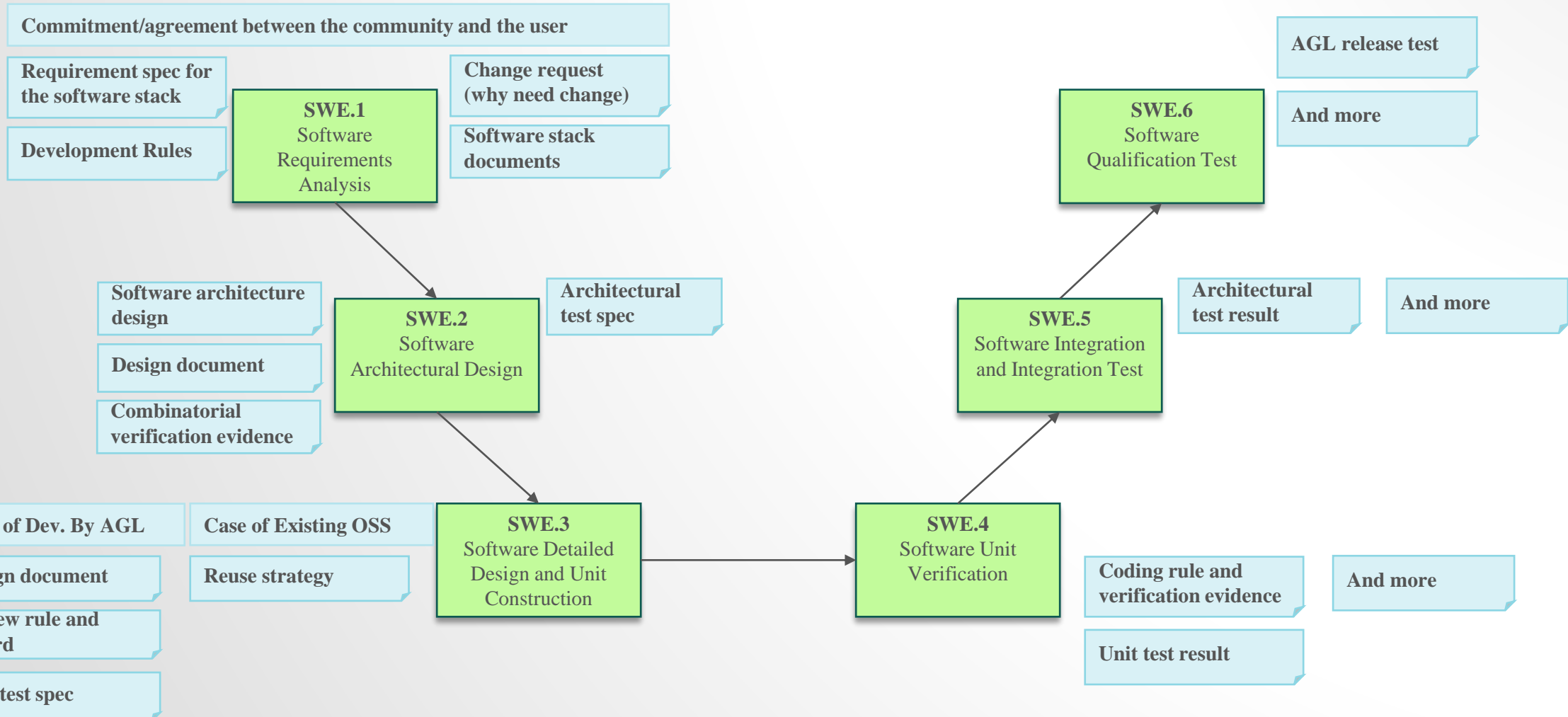
# What is the current AGL gap with future?

- Comparison of the current AGL development process with the V model.



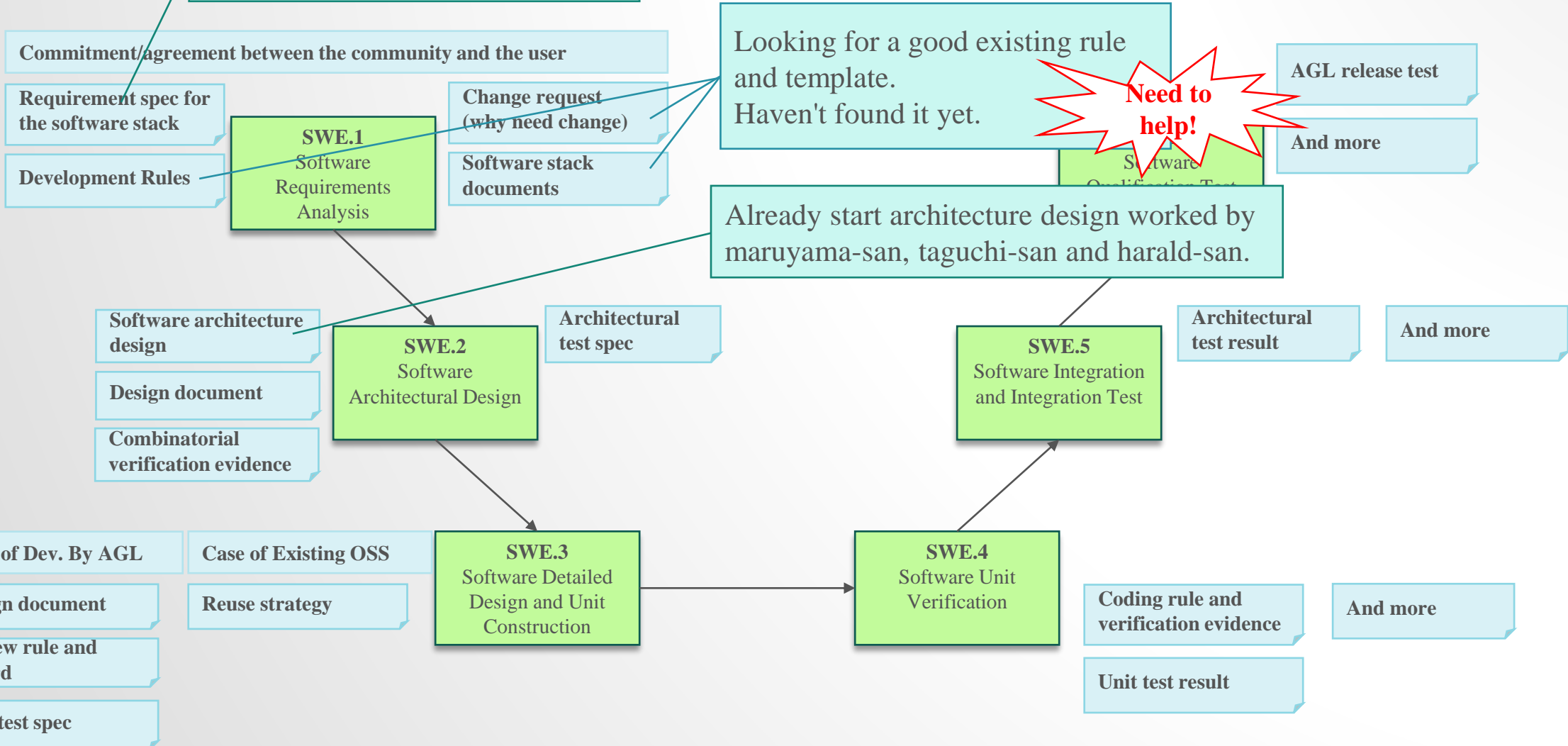
# What is missing?

- IC-EG development process SWG are discussing this topic



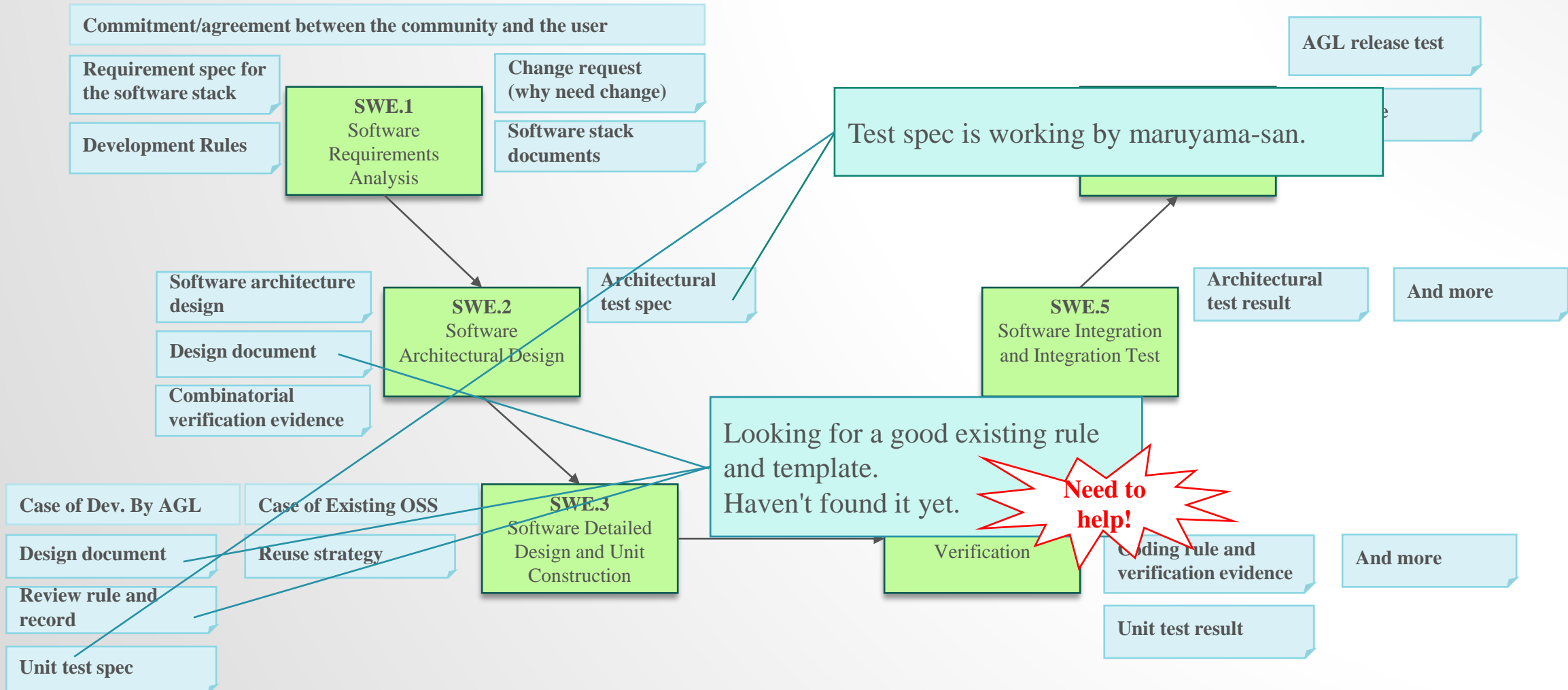
# What is missing?

- IC-EC Already start requirement spec definition lead by haraki-san. Process SWG are discussing this topic



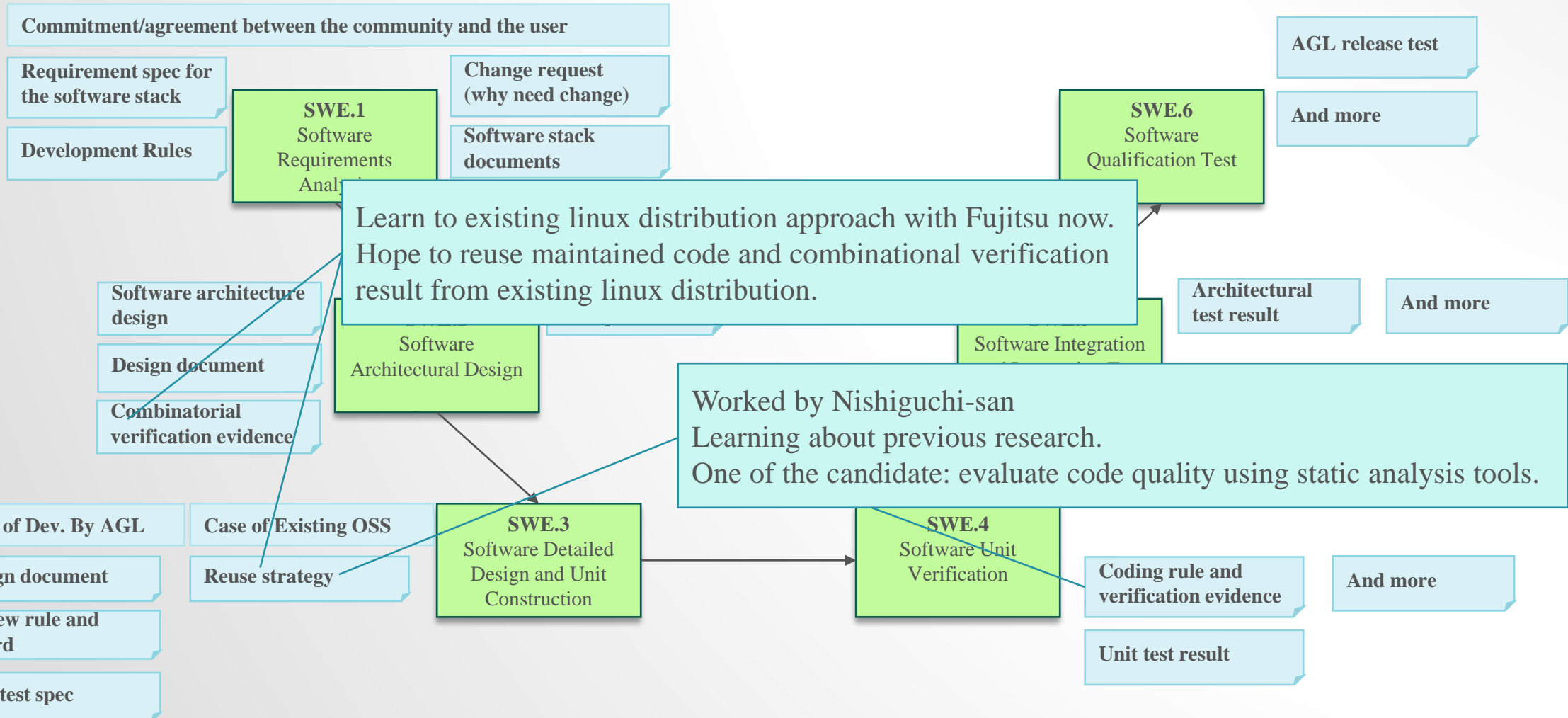
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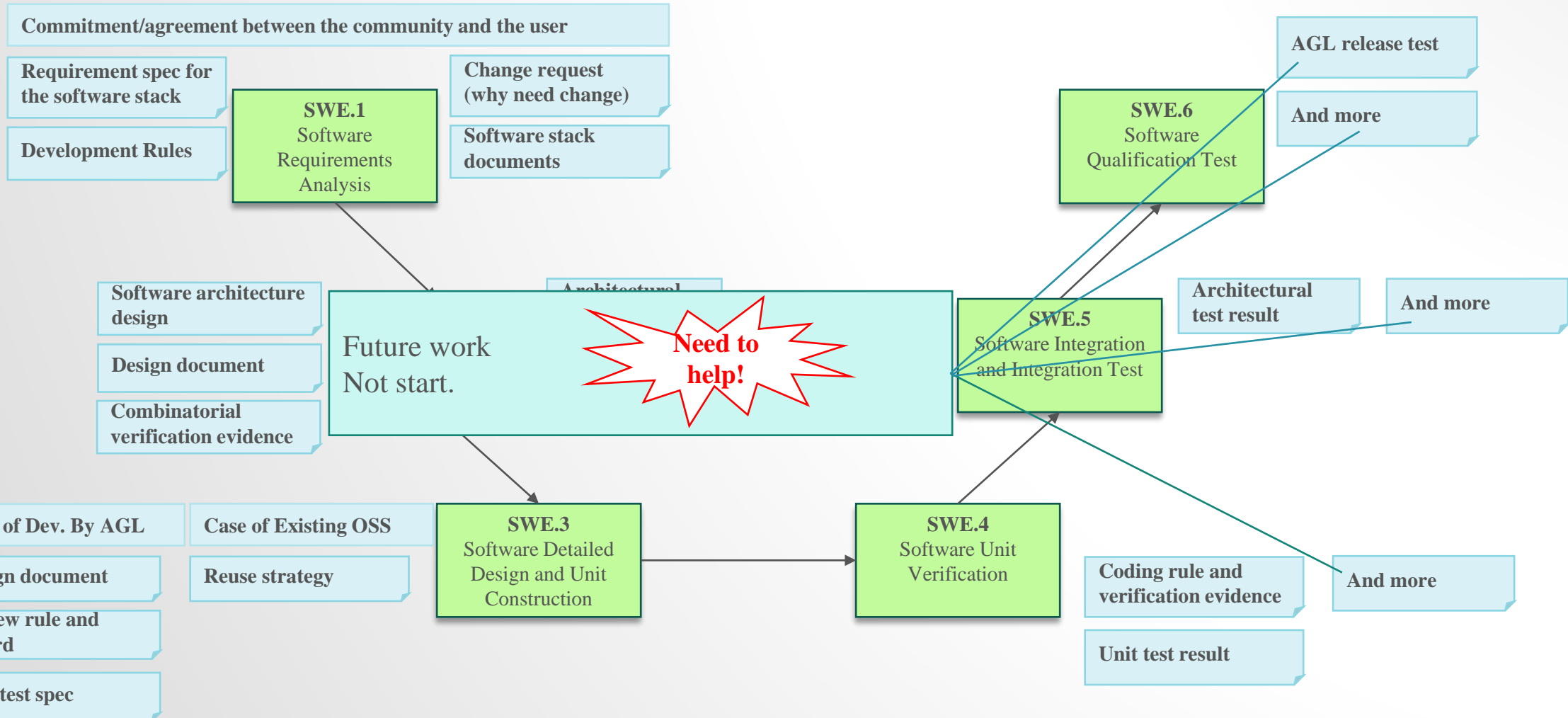
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# Many issue...

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- These are just a few part.
  - If we will change to new AGL development process, can we keep the current release cycle?
    - Current development and release process for AGL distributions is a very simple.
    - New AGL development process requires to create a lot of document and evidence.
  - Is it possible to use the same codebase for the instrument cluster and infotainment?
    - LTS codebase is common issue both instrument cluster and infotainment.
    - When we want to add and update OSS, current AGL require to gerrit code review only. But new process requires pre-assessment and document review.
  - New AGL development process require to extended infrastructure.
    - Need to development tracking system, because new AGL development system require to traceability from document to code and evidence. I think that can be achieved with jira and confruence. The settings may need to be changed.
    - Need a static analysis infrastructure for all OSS code included in AGL.

# My question

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Can you agree to an ongoing discussion on these issues?

We can create trial environment?