The R&D Quality Management

- Rhuang39

ADAS | SOFTWARE

Turn Around
Automotive Operations

Modernize
Everywhere

Disrupt
Ourselves

Ford

❏ Item Overview

Research and Design   Production   Sale and Service

Product Quality				
ISO 26262	ISO 21448	ISO 21434	Good design …	FMEA
Development Process				

Production Quality				
Control plan	MSA	SPC	PFMEA…	PPAP
Production Process				

Customer Quality		
Customer complain	FTA	Market problem solving
Customer Quality Process		

ISO 9001/IATF 16949
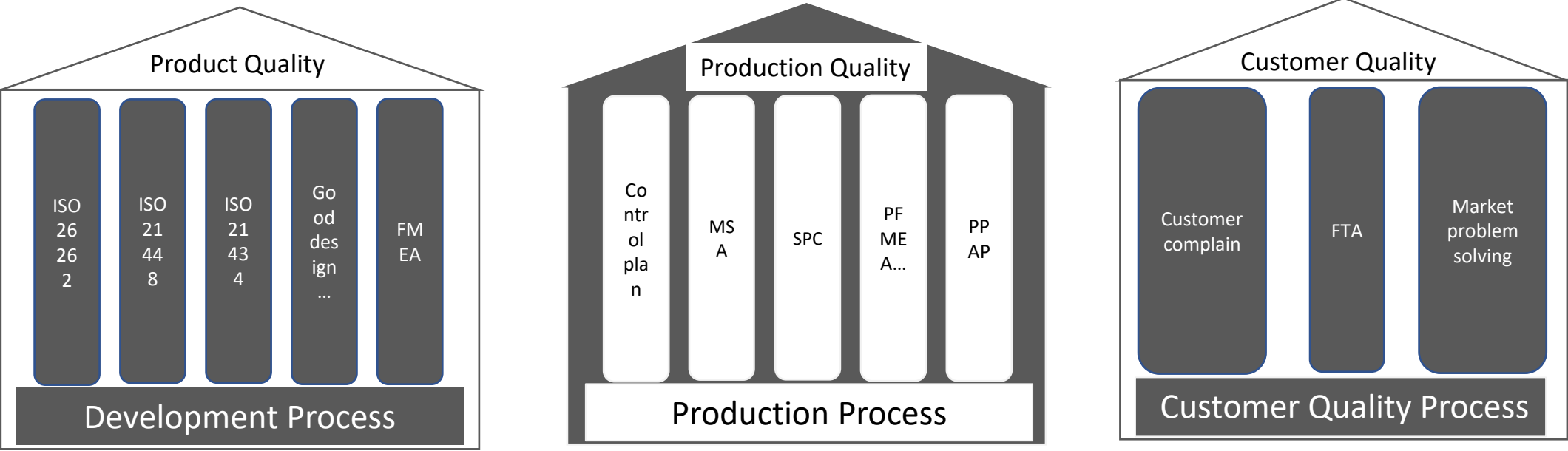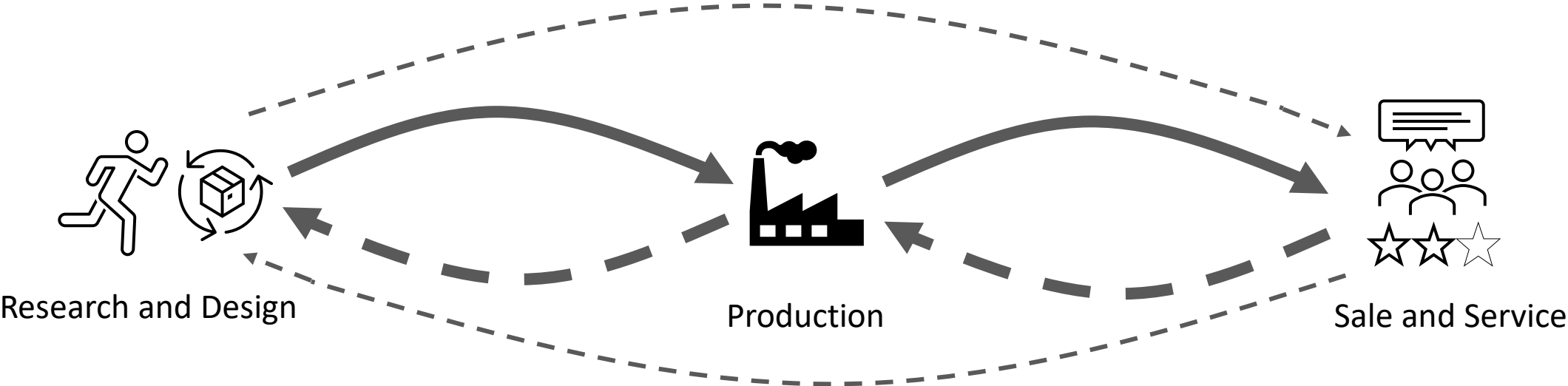
❑ Item Overview

❑ The focus of R&D Quality Management

Define Development Process

- Milestone
- Product Maturity
- Workstream
- Work products
- Metrics /Monitor
- Method
- Template
- Roles
- Responsible & Authority
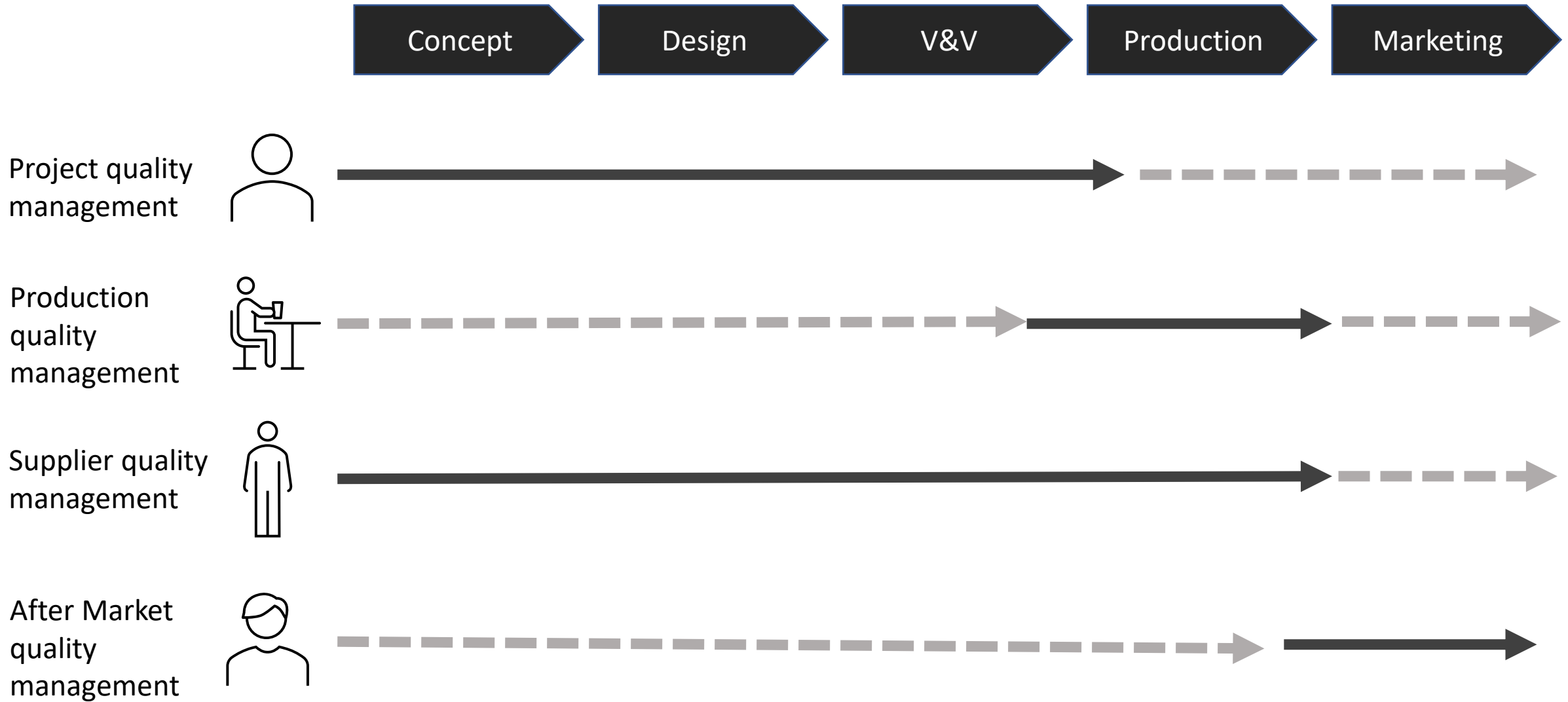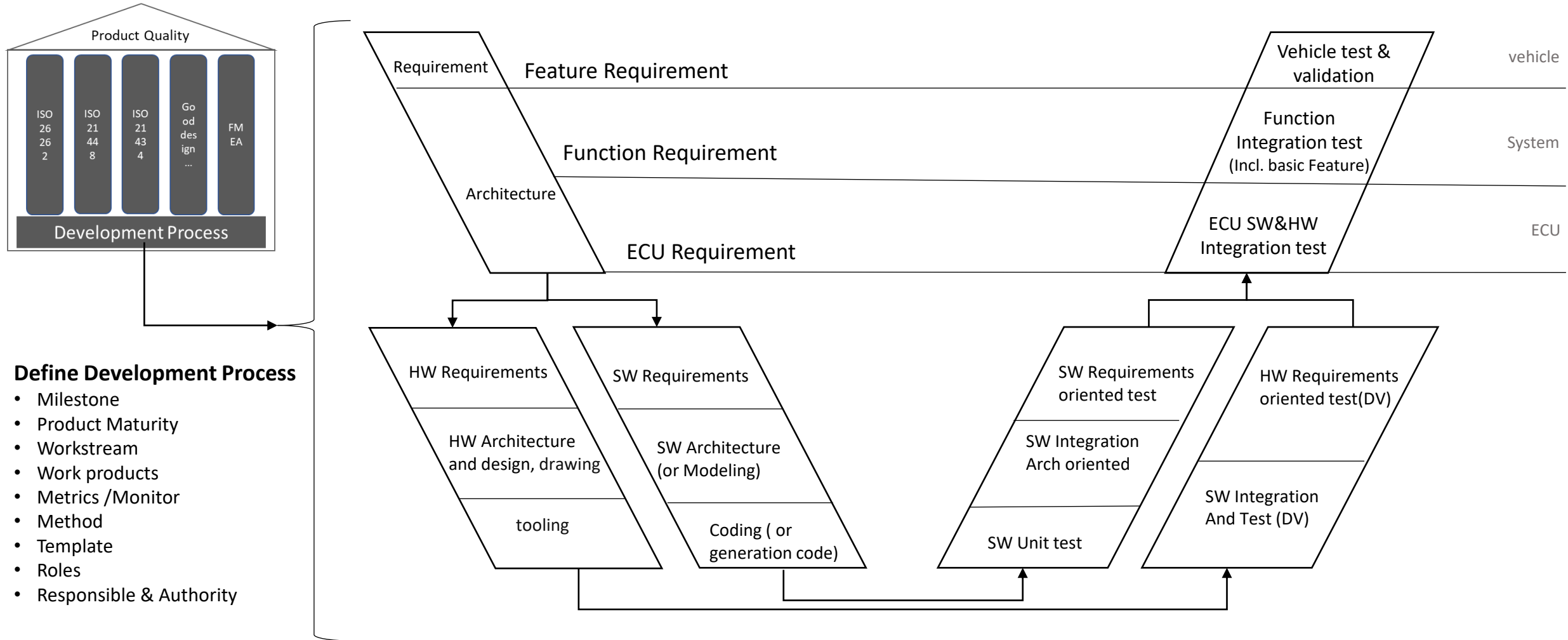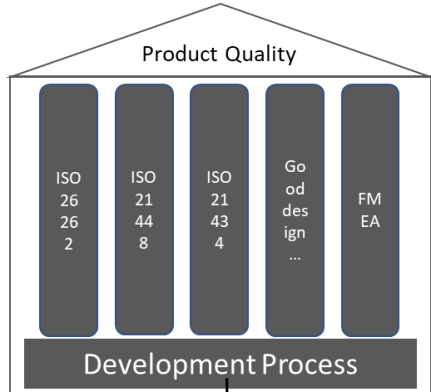
- The 'SW requirements-oriented test' has some overlaps with "ECU SW/HW integration test", usually, after SW/HW integrated, the SW Requirements-oriented test would go on.

❑ The focus of R&D Quality Management

These two standard shall be included in the scope of development processes
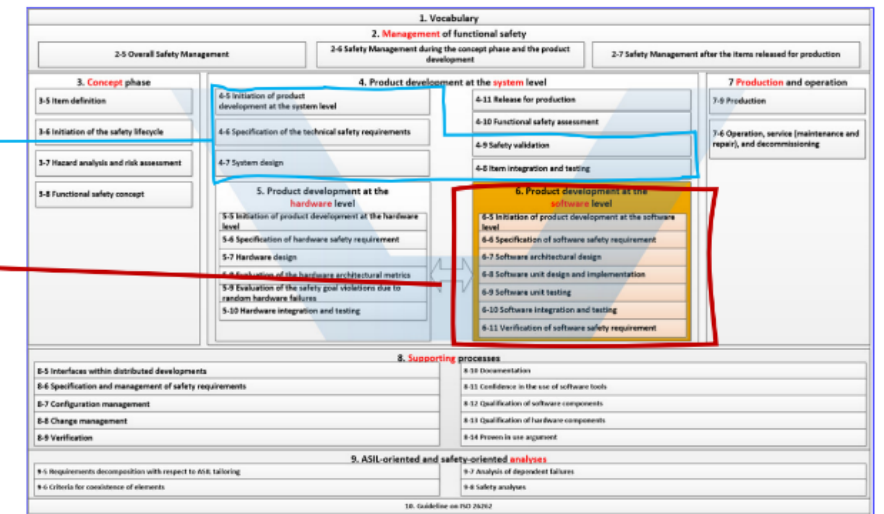
❖ At "What" level, the process definition should consider the requirements from functional safety and cybersecurity.

❖ At "How" level, the methods, template and specific outputs could follow the requirements of Functional safety and cybersecurity separately .

Framework Overview

➢ **Functional safety ISO 26262**

➢ **Cybersecurity ISO 21434**
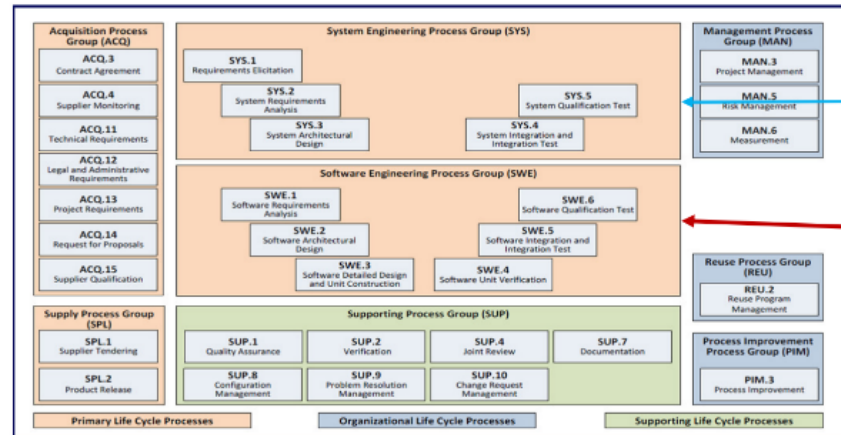
Automotive SPICE

ISO26262

❑ The focus of R&D Quality Management

Product Quality

| ISO 26262 | ISO 21448 | ISO 21434 | Good design … | FMEA |

Development Process

Use of Quality tools
➢ D-FMEA
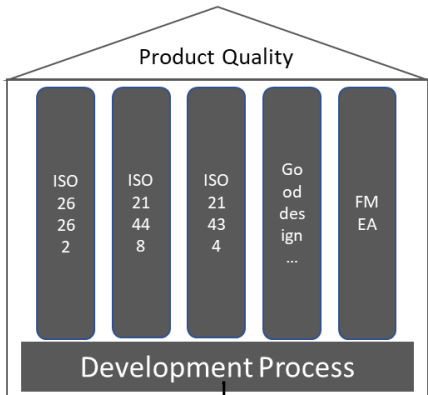
- Design failure module and effect analysis (DFMEA) is a systematic method used to detect the potential failure and mitigate risk in advance

- There is a little differentiated between Software DFMEA and Hardware DFMEA

D-FMEA

Software D-FMEA

Step No.	Item
1	Prepare
2	System scope
3	Function analysis
4	Failure analysis
5	Risk analysis
6	Measure
7	Documentation

Hardware D-FMEA

Step No.	Item
1	Prepare
2	System scope
3	Structure analysis
4	Function analysis
5	Failure analysis
6	Risk analysis
7	Measure
8	Documentation

❑ The focus of R&D Quality Management

Product Quality

ISO 2622	ISO 2448	ISO 2143 4	Good design …	FMEA

Development Process

Use of Quality tools
➢ Design Review
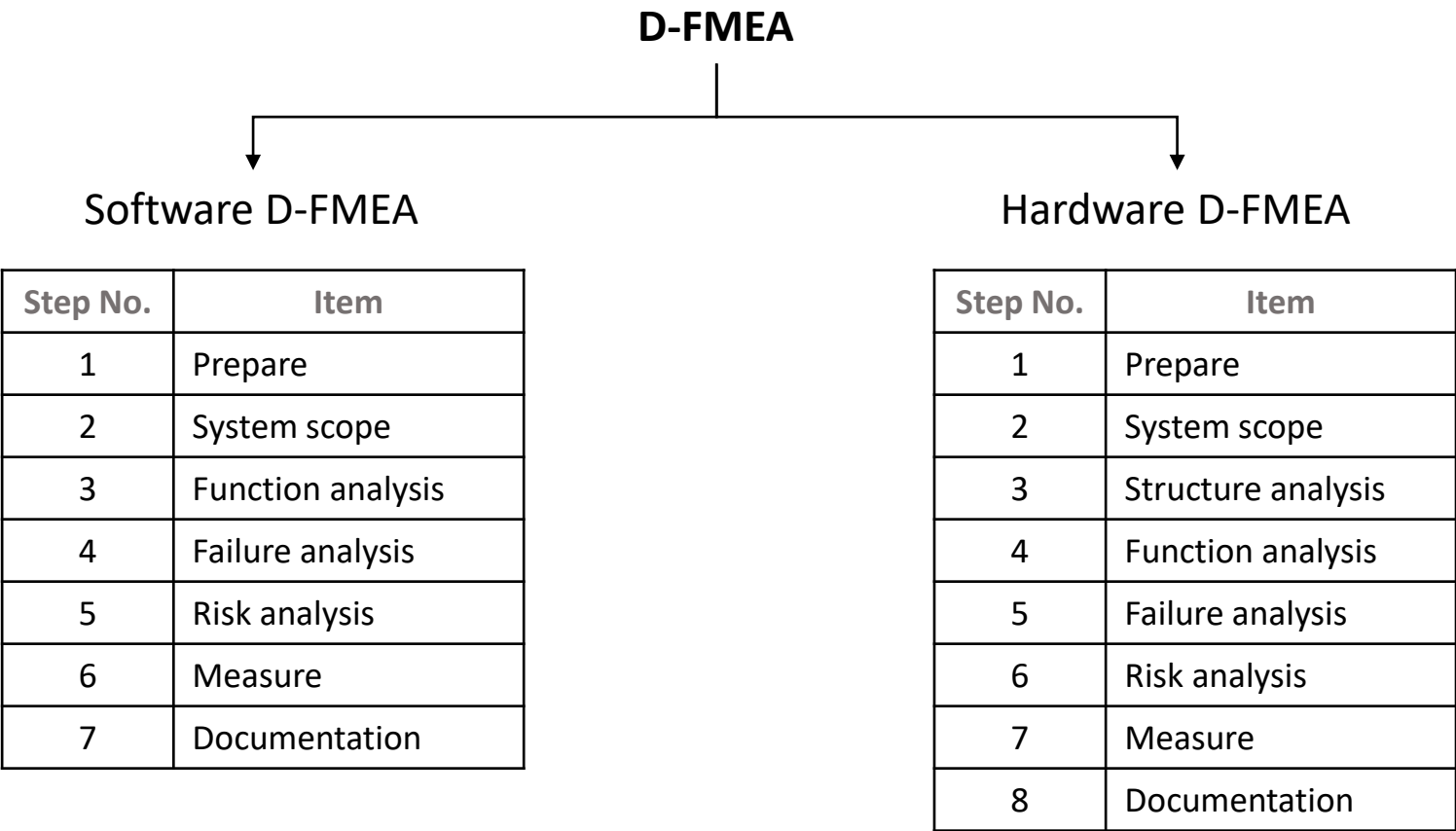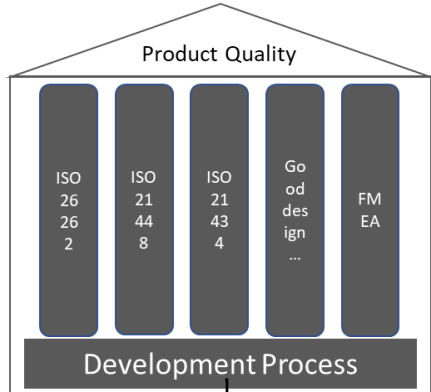
- A design review is a meeting of a cross-functional group of technical people assembled to probe and demonstrate the thoroughness and competency of a proposed design`s ability to maximize Ford customers' perceived value..

Define the Subsystem /Components to be Reviewed

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Select Design Review Dates

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Publish Design Review Schedule

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Develop Agenda for a Design Review

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Develop a List of invitees to Support the Agenda

↓

Conduct Design Review

↓

Document and File
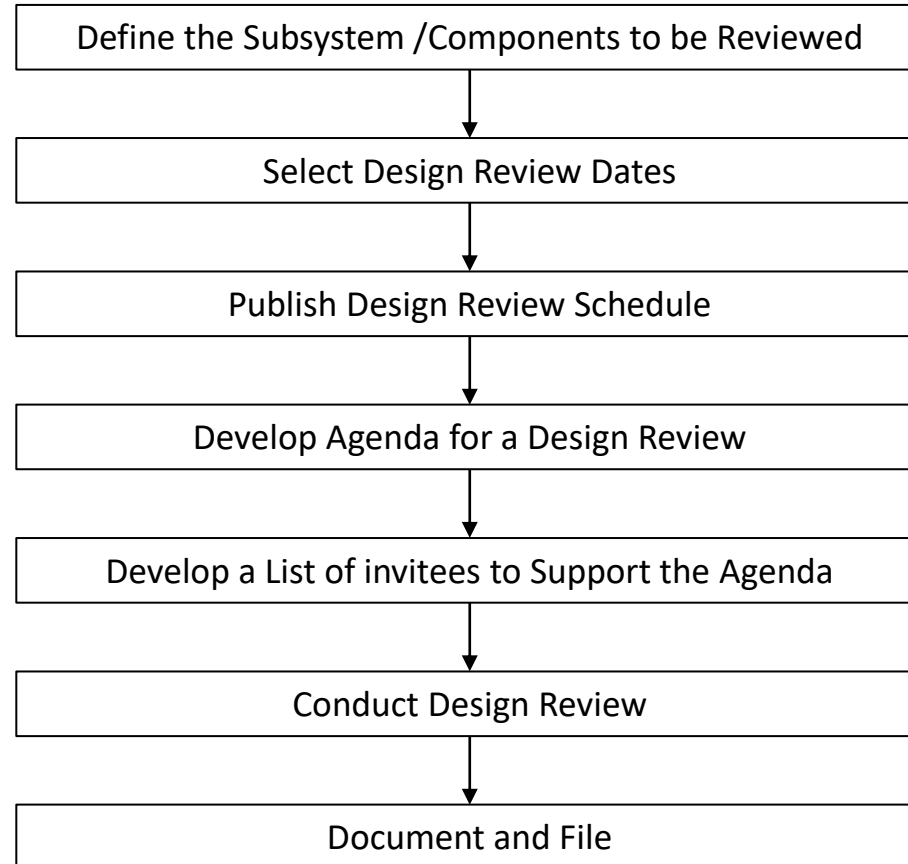
Design Review is:
- 80% technical focus/20% program status
- A peer review
- Focused on technical fundamentals
- Scheduled on a regular basis
- Using existing documents
- An honest exchange of ideas
- Learning experience
- A collaborative effort
- Informal
- A sharing experience ("fresh eyes")
- As detailed as is required
- A positive experience

❑ The focus of R&D Quality Management

Product Quality

| ISO 26262 | ISO 21448 | ISO 21434 | Good design … | FMEA |

Development Process

Use of Quality tools
➢ Lesson Learned
& Re-occurrence Perveance

- A combination use of Lesson learned and Re-occurrence Perveance could strengthen support continues development .

Plant mass problem

Customer compliance

Recall

Topic define & Focus team

Rote cause analysis

Design standard update

Process update

People training

Documentation

Re-occurrence Perveance (RP) list

Determined RP items for project

Check implementation during design phare

Check implementation of RP during verification and validation phase

Project RP report

The R&D Project Quality Management in Project

Project quality management

| Concept | Design | V&V | Production | Marketing |

- Check the adherence to standards
- Metrics collective and Dashboard
- Ensure the Quality of release
- Define or Adaption of process/template/work product
- Ensure the Quality of Gate
- Topic leading, consulting, Training
- NA correction and Actions
- Internal or external Audit/assessment

REPORTS
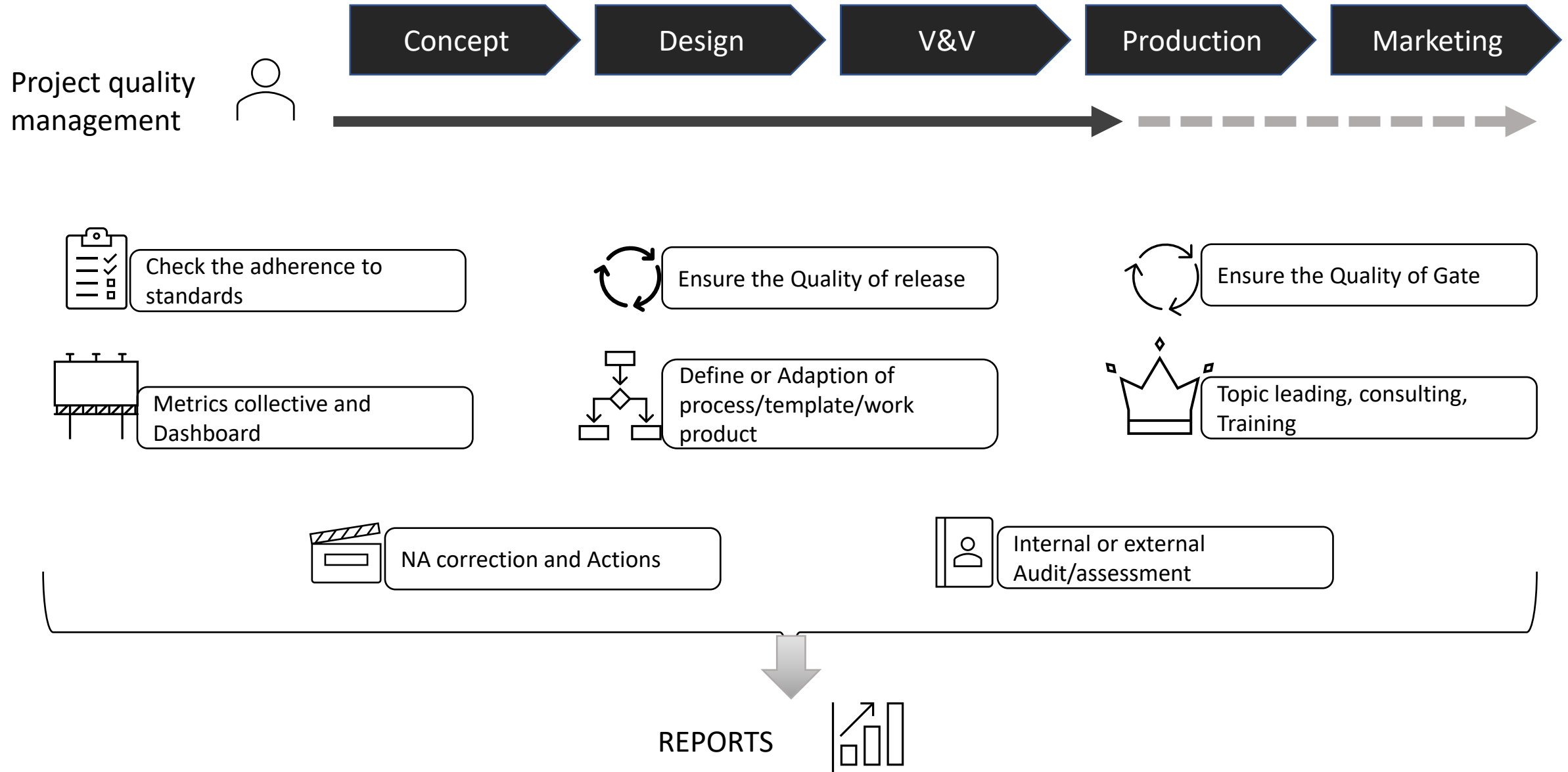
❑ The R&D Project Quality In Agile Project_ Adaptation

Can we go faster?

Too many separate docs

Too many meeting

Paper works

ASPICE with Scrum?

Why shall I do that?

Process is too long

I don't know the target

I just do it without understanding

Innovation be killed

Is it safe? Or too safe?

Why we still have so much bug?

Build-in Quality

🔑 Our Insist: Do right things, Do things right

- Which means we will put more effort to understand what's customer need, the requirements, the Tech scheme and the strategy. Meanwhile, understanding the methods, the AGILE workstream, the ASPICE.
- I seen many fake Agile and Fake ASPICE which kill developers. Agile, Do it right, or don't do it.

🎯 Correct and consistent use Define-of-Done (DOD)

- What developer really want to know is: where shall I achieve ? DOD provide QA an opportunity to Embedding Quality requirements into the Agile. Quality run with scrum rather than post-check.

🧠 Employee awareness and competence become more important

- The biggest waste of the team is not the development/test, but the huge communication failure because of lack of common awareness and same language

Focus on Process purpose, rather than process itself

- Process setting, not tailoring, but adaptation. Process and agile operation mode matching

📈 Clear Metrics, Data-driven

- Use Metrics to give team member a view of what target shall be achieved,
- And monitoring the states of Project quality, development quality and process quality
- Support "Evidence-based decision making"

•THE END