



JONAS WESTMAN AND ANDREI BESPAMIATOV

# SCANIA VISION AND TABLE EDITING

**SCANIA**



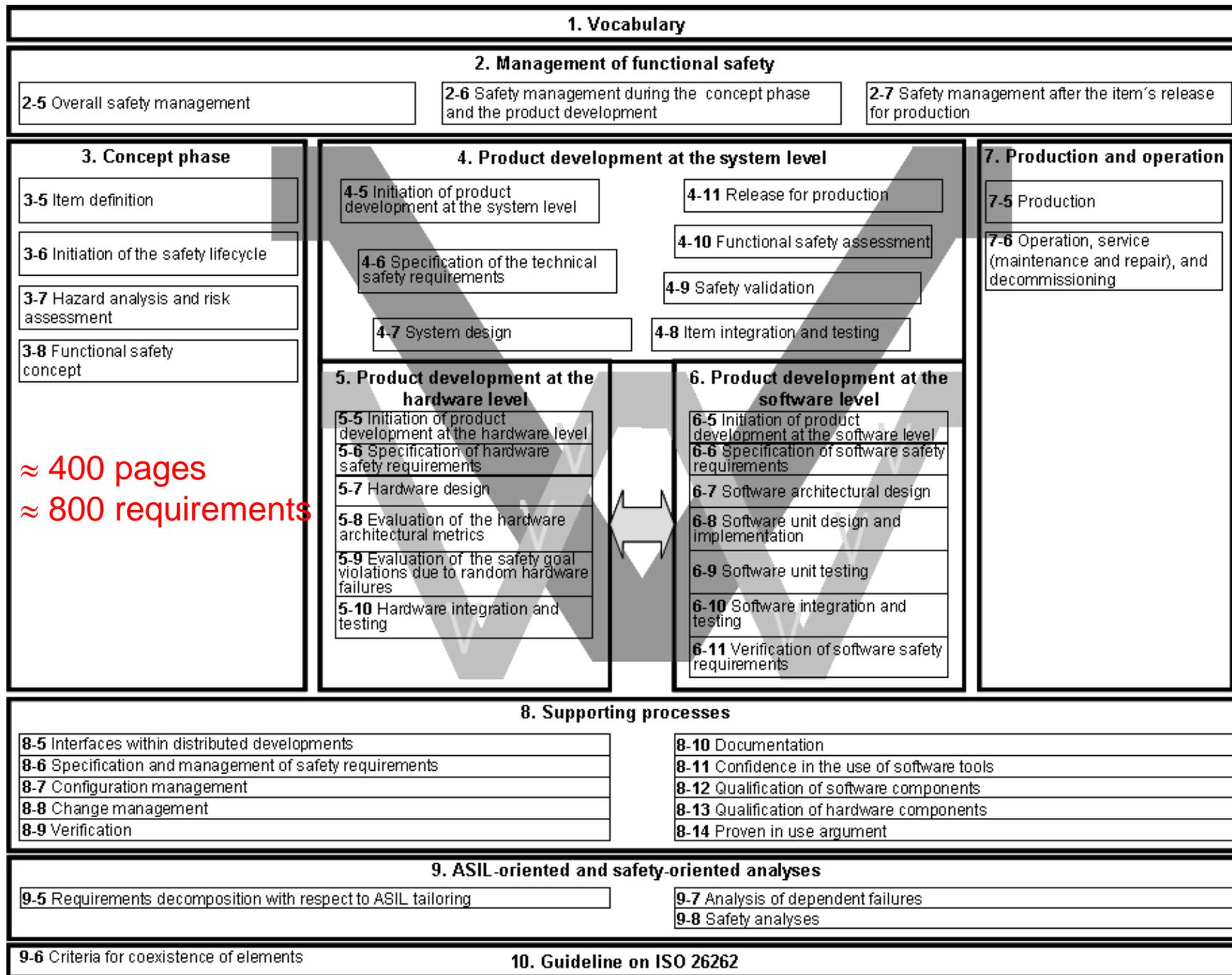
- ~50000 employees
- Company in VW Group (Heavy Vehicles)
- In-house development
- Embedded systems development: 1000+ employees
- The product: a “truck” in many versions and configurations
  - Module system!
- Continuous development and integration
- Agile and lean





# Background - Challenges

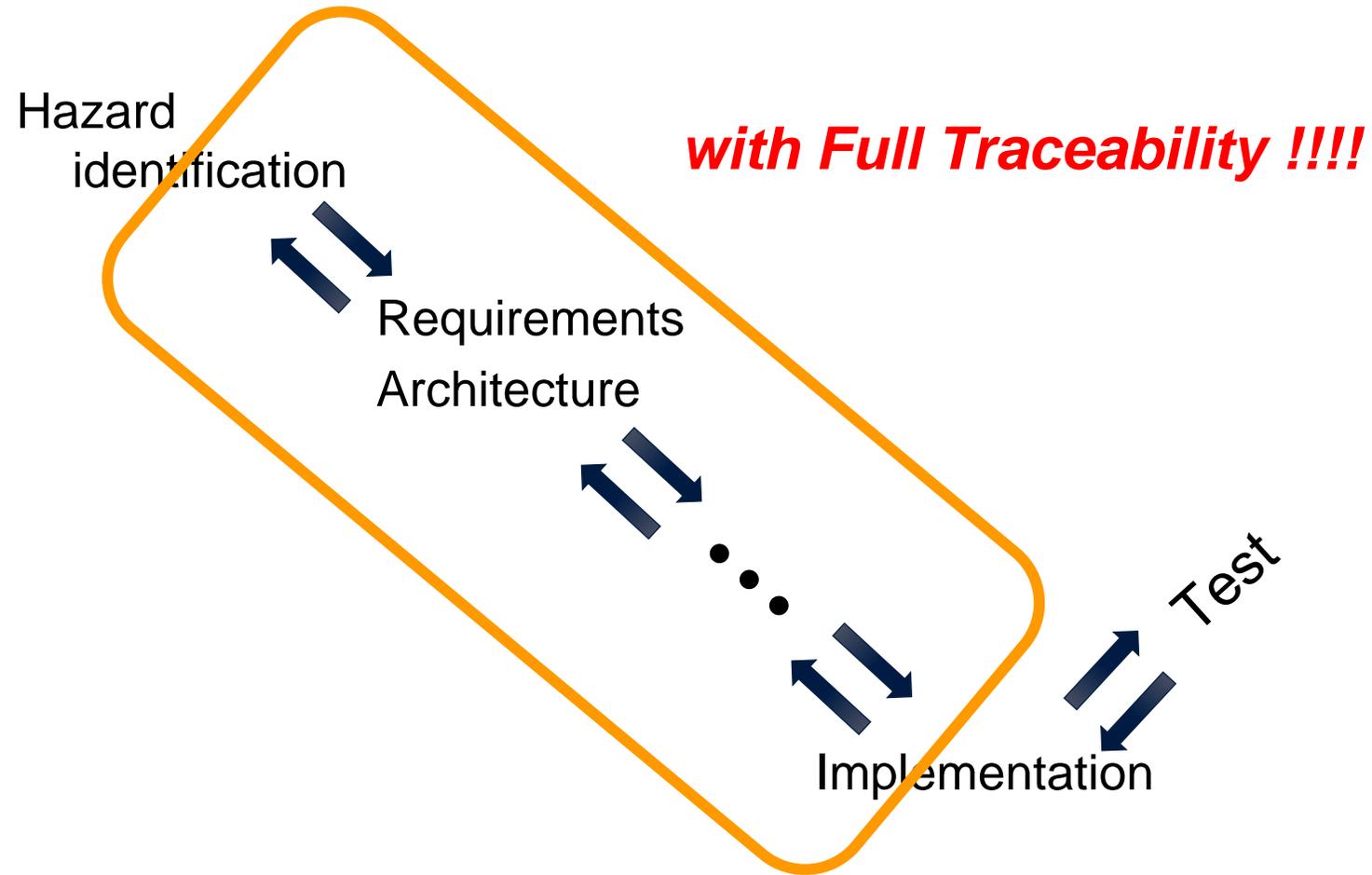
- Increased complexity
  - High performance ECU
  - Multi-threaded, multi-core
  - CAN to ethernet
  - Over the air communication
  - AI-based computation
- Ensure same level of safety
- Standard ISO 26262 - **We need to prove safe!**



≈ 400 pages  
 ≈ 800 requirements

Core processes

# Core of ISO 26262





# Digitalization Vision

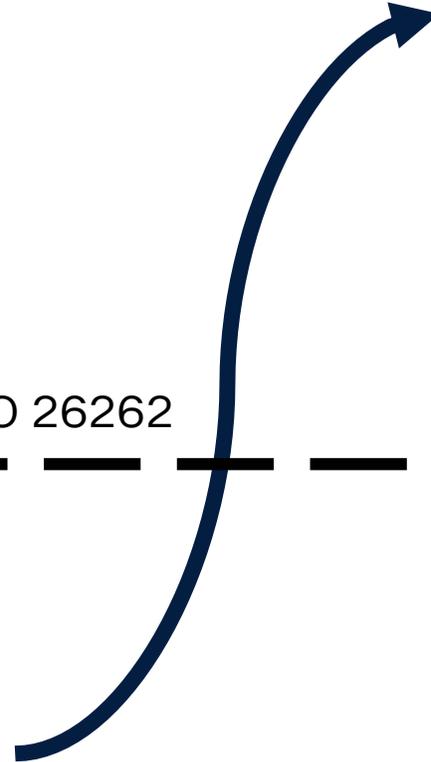
## Digitalized Development

- automatization
- increased product quality
- increased development speed
- less engineering hours
- ability to change the product !

Traceability required by ISO 26262

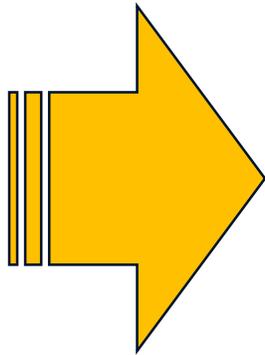
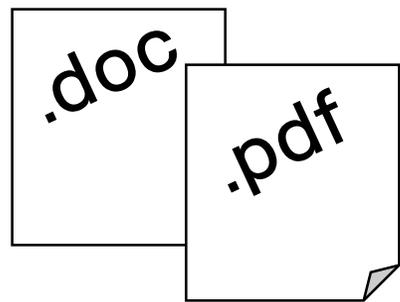


**SCANIA**

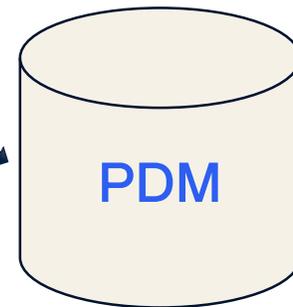
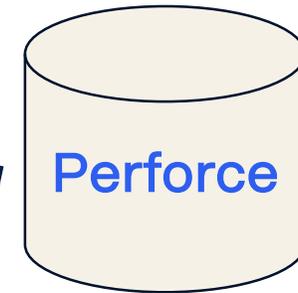


# From Informal Documents to Machine Readable and Integrated Data

- Requirements
- Architectures
- Specifications

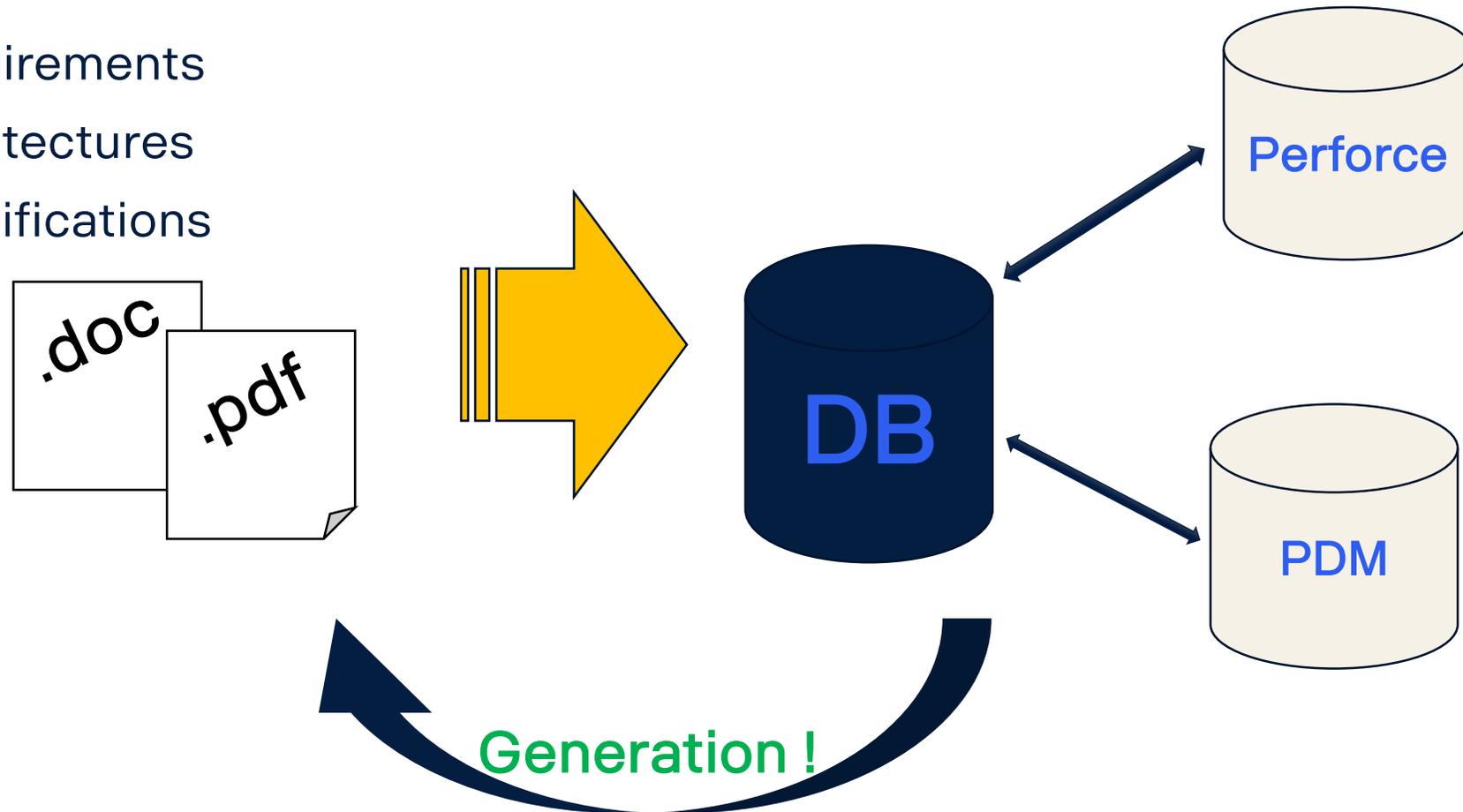


Traceability !



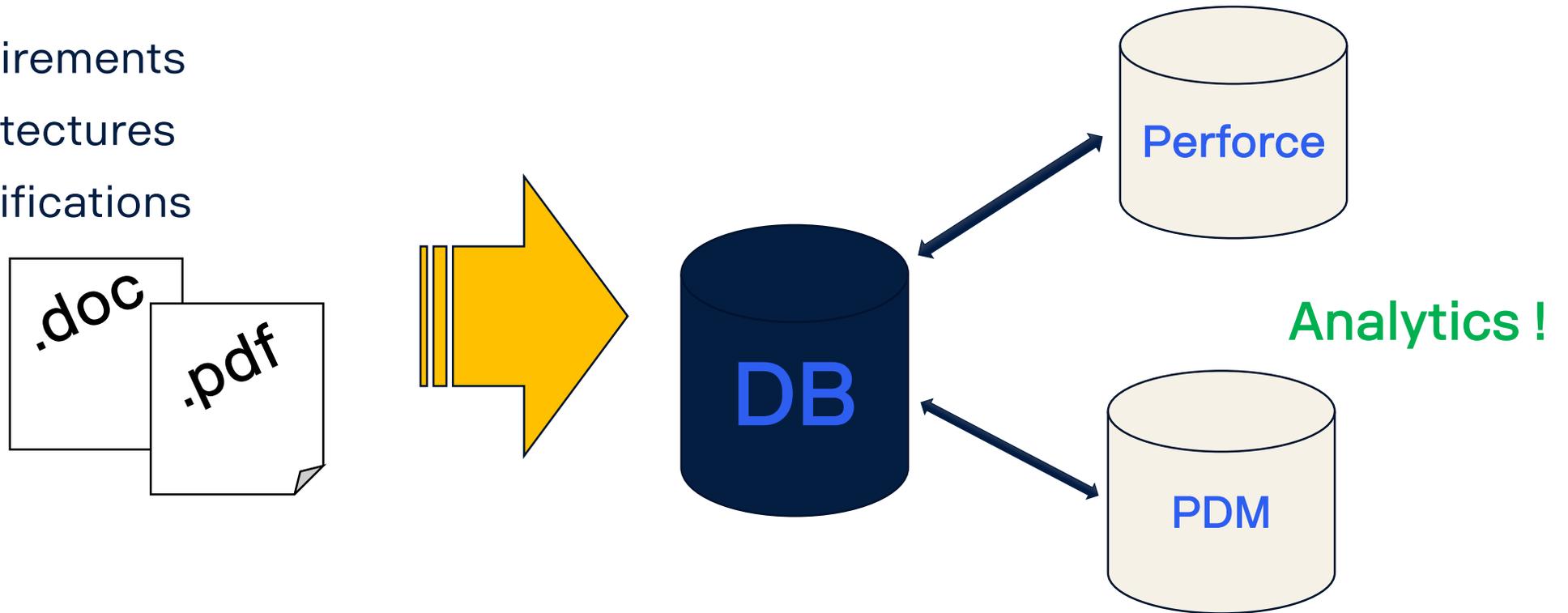
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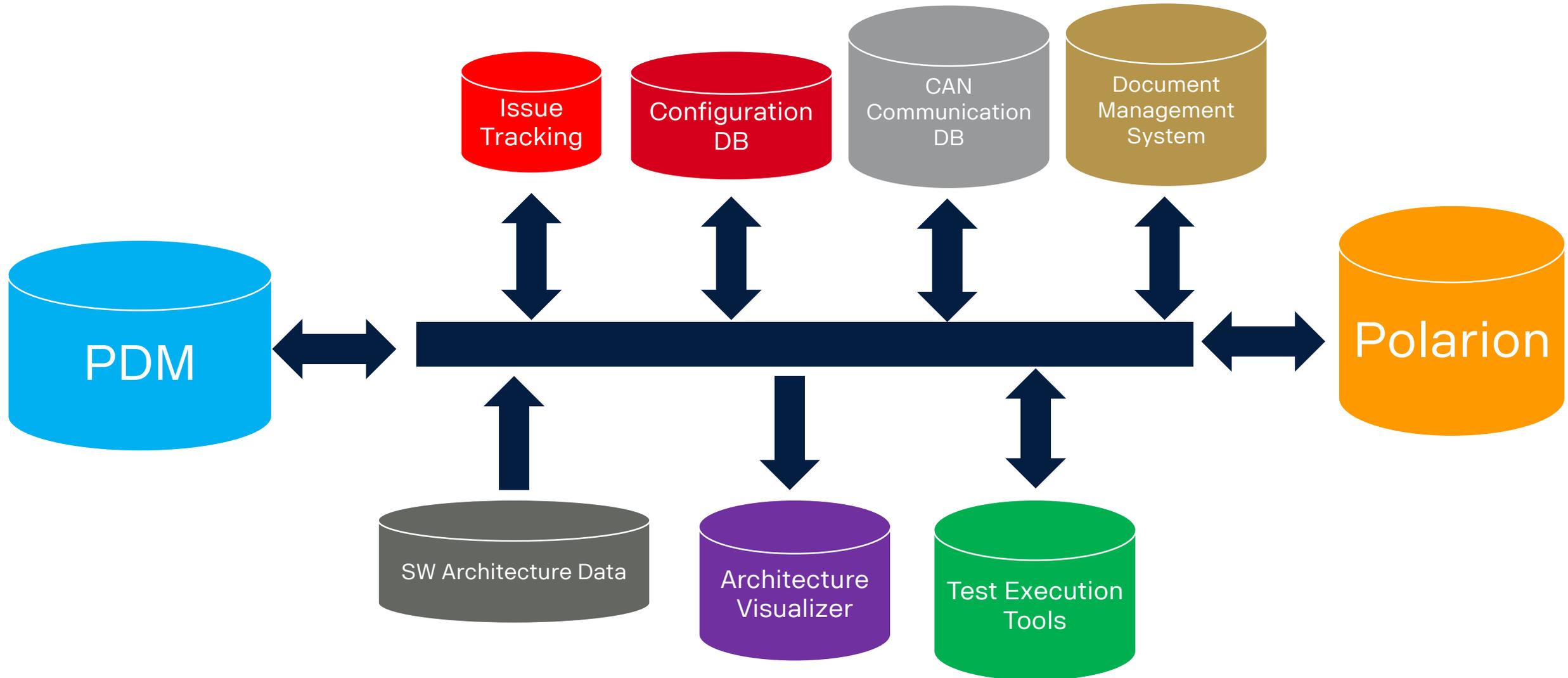
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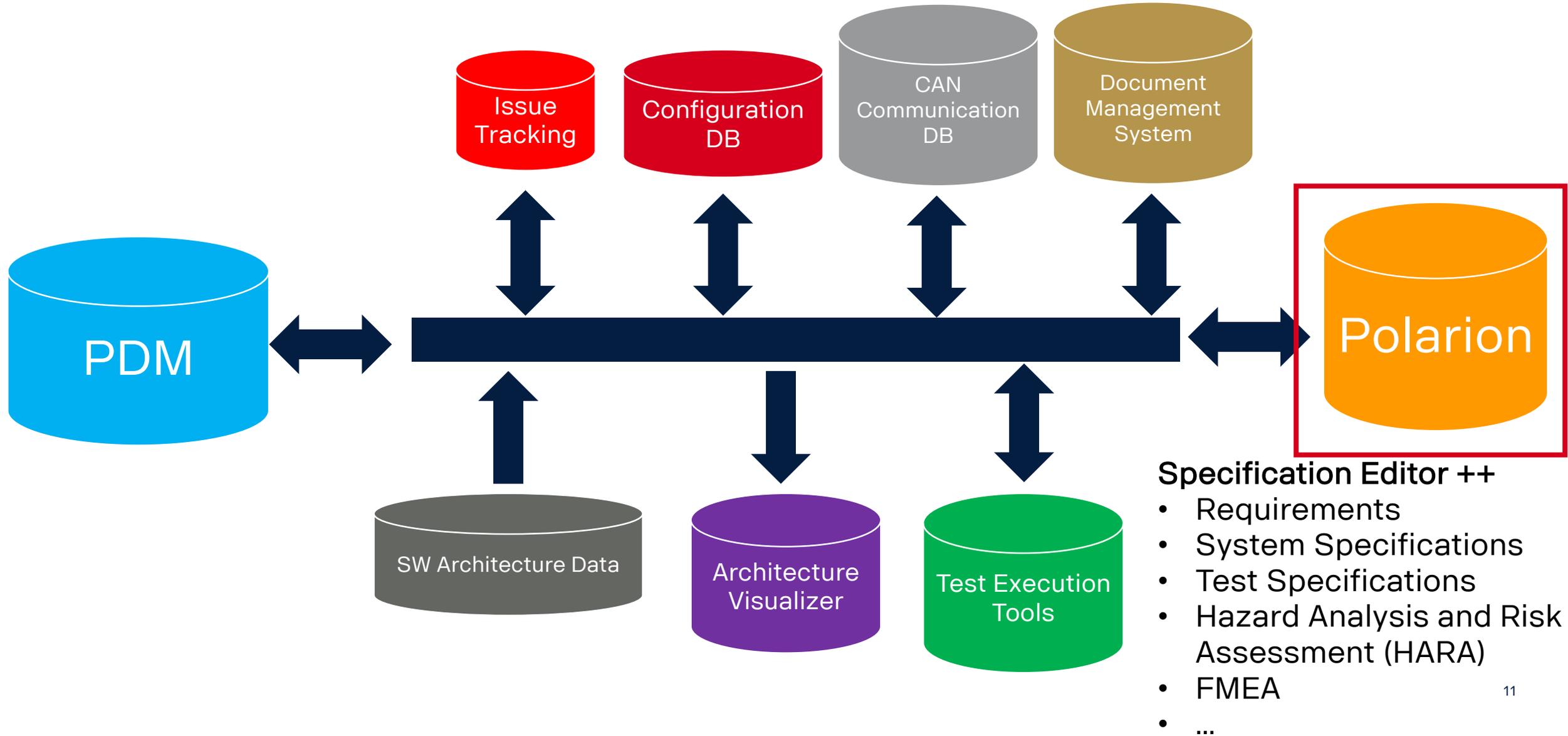


# Tool-chain overview





# Tool-chain overview





# Tables in Specifications

## System Specification

The system shall...

Port ID	Name	Description	Range
8	levelSens or	Input from fuel sensor...	0-110
6	Pwm_out	Magnetic pulse output...	50-70
1	Volt_ref	Reference voltage...	0-24
...	...	...	



# Table Editing in Polarion standard GUI?

- Supported...., but
- the information cannot be entered such that it is structured/stored as Work items!

*project and to external stakeholders. Special communication issues, such as offshore outsourcing, require particular attention. A table such as that below is a convenient way to describe the communication expectations.*

Type of Communication	Communication Schedule	Typical Communication Mechanism	Who Initiates	Recipient
Status Report	every Friday	team meeting	Project Manager	Project Team
Schedule and Effort Tracking Report	weekly	email	Project Manager	Program Manager
Project Review	monthly	face to face	Project Manager	Project Team
Risk Mitigation Status	as mitigation actions are completed	email	responsible team member	Project Manager
Requirement Changes	as changes are approved	email and change control tool	CCB Chair	affected Project Participants
Supplier Management Review	at project life cycle gates	video conference	Program Manager	Project Manager, Program Manager, Subcontract Manager

## 3.4.5 Metrics Collection Plan

*WFO: Specifies the methods, tools, and techniques used to collect and retain project metrics. Address metrics to be*

- Extend Polarion with "structured/data-driven" Table editing!



# Table Editing - Basic

System Specification

The system shall...

Fields

Polarion

Port ID	Name	Description	Range
8	levelSens or	Input from fuel sensor...	0-110
6	Pwm_out	Magnetic pulse output...	50-70
1	Volt_ref	Reference voltage...	0-24
...	...	...	



# Tables Editing- Advanced (Hara)

Diagram illustrating table editing with annotations:

- Link to WI (points to the Hazard column)
- Link to WI (points to the Operational Situation column)
- Reference Info (points to the Exposure column)
- Field (points to the ASIL column)

Hazard	Operational Situation	Exposure	ASIL	Comment	

Hazardous Situation



# DEMO



# THE END