

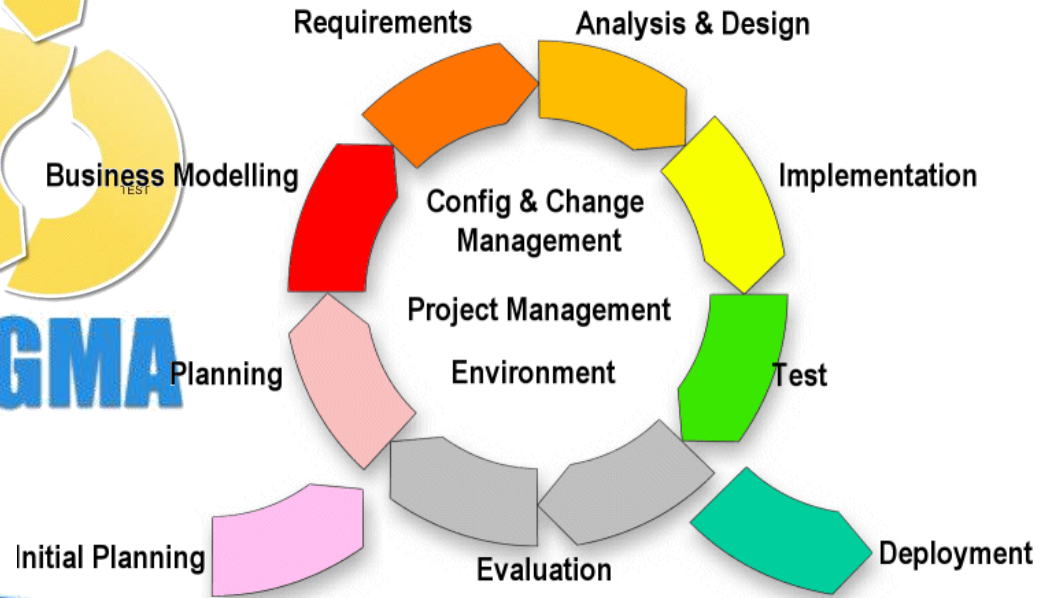
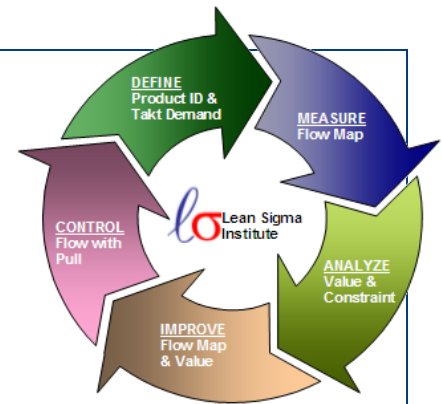
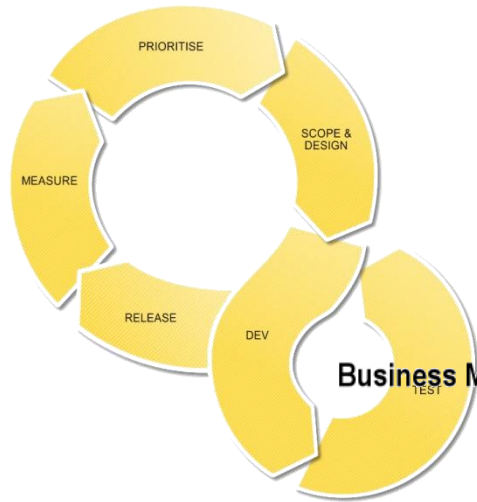
Utilizing VDM Models in Process Management Tool Development: an Industrial Case

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Agenda

- Business Area
- Tool
- Research Project
- Applying VDM Modelling in the project
- Results
- Future Work



SIX SIGMA



PRINCE2

SM
CMMI



Tools

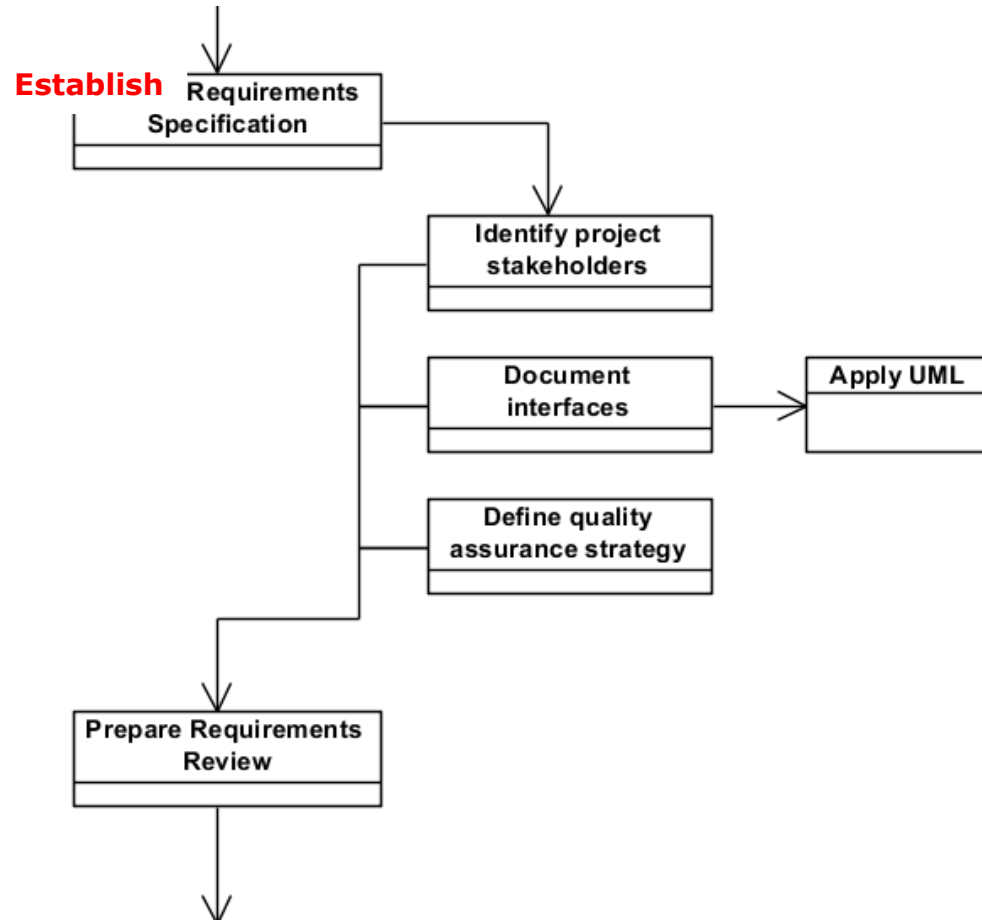
- Construction and Optimizing of processes
- Process Improvement Focus
 - Definition
 - Control
 - Communication
- Industry partner
 - Callis (www.callis.dk)
 - Software suite for process definition and improvement
 - Used by Infineon, Logica, Systematic



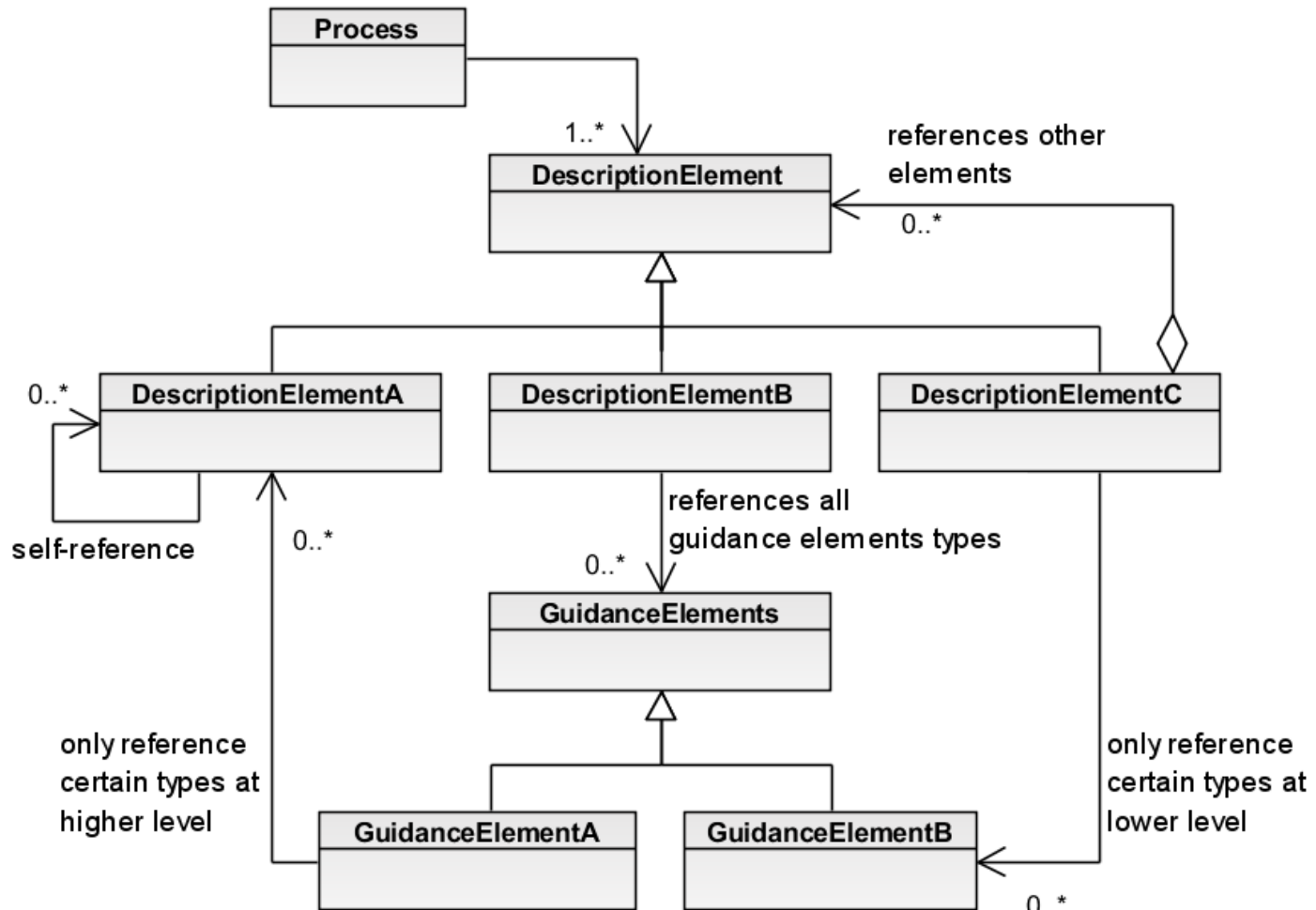
The tool – defining a process

- Multi-model, multi-standards environment
- Manage multiple versions, releases and users levels
- Traceability regarding changes and differences between versions
- Uses predefined elements for process definition
- Relations are complex
 - high number of relations,
 - cyclic references,
 - requirements and restrictions

Complexities in process description



Complexities in process description



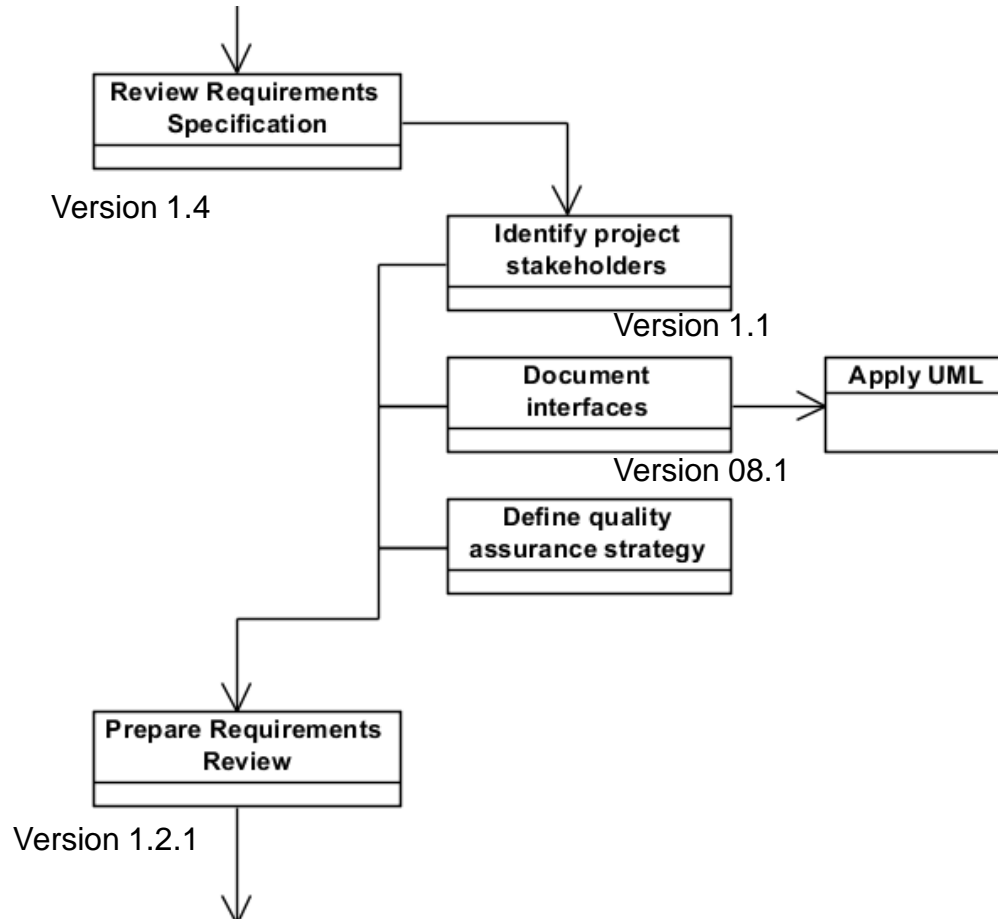
Research Project

- Improving business processes through more advanced tool support.
- Extending the existing tool in two parts:
 - Tailoring
 - Probing

Tailoring

- Static
 - Overall process is defined and specified at a high level in an organization
 - Applied at the lower and more specific project level
- Dynamic
 - Allow the end-user to make adjustments to a process
 - Use the knowledge and hands-on experience of the process end-users
 - Scoped text descriptions added to process elements

Tailoring - Example



Probing

- Probing the data of the files related to a process defined artefact
- Gates (milestones) and their artifacts

Gates And Their Artifacts

Artifacts	Valg af grupper	Aflevering af projektformulering	Aflevering af første version af kravspecifikation	Ny revision af kravspecifikation	Aflevering af første version af systemarkitektur	Ny revision af systemarkitektur	Produkt klar til accepttest	Gennemført accepttest	Endelig Aflevering
Accepttestspecifikation			M	O				M	M
Gruppe Beskrivelse	M								
Hardware							M	M	M
HW-struktureringsdokument							M		M
Kravspecifikation			M	O					M
Projektformulering		M							M
Software							M	M	M
SW-designdokument							M		M
Systemarkitektur					M	O			M

Created
 Ready for review
 Done
 Not ready at phase shift

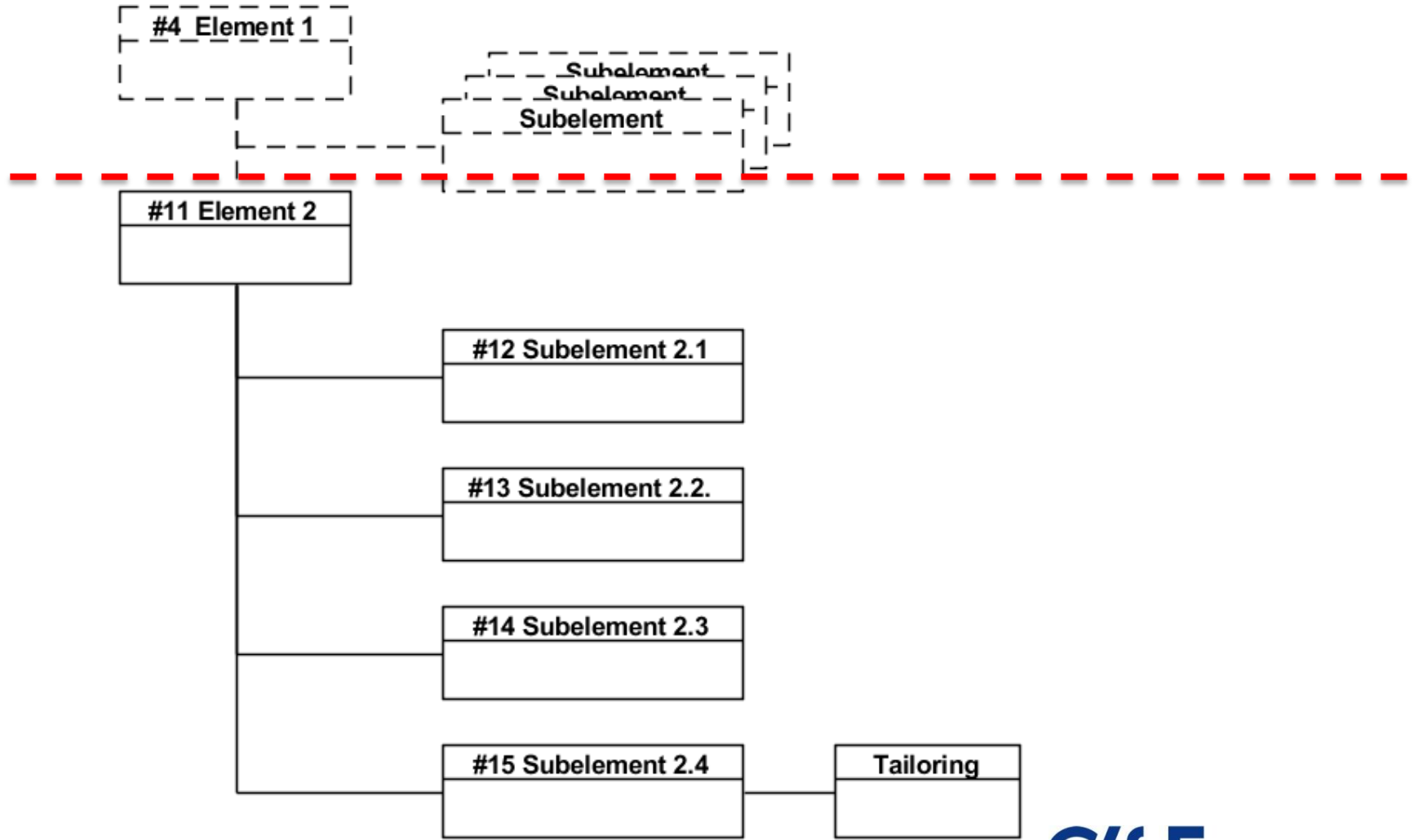
Applying VDM Modelling to the project

- Industry partner with no knowledge of formal modelling,
- Academic partner with nearly no domain knowledge of the business field,
- Modelling used to:
 - Analysis of existing tool
 - Explore expansion
 - Increase communication

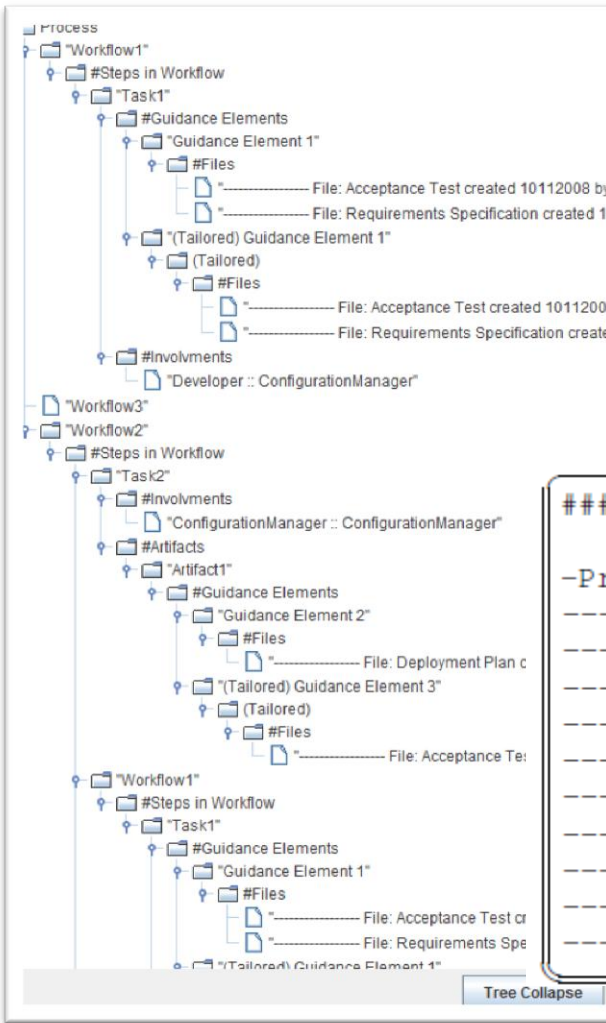
Executable VDM++ model

- An executable model for a subset of the existing tool has been created in VDM++
 - Two months
 - 16 classes
 - 2500 lines
 - Focus on the parts related to the project
 - Weekly meeting

Example of modelled scenario



Running Examples



```

###-- Displaying tailored elements

-Process Set-
----#18 The Super Process 1 version 2
-----Elements
-----#4 Element 1
-----SubElements
-----#5 SubElement 1.1
Tailoring test text (HealthCare Project)
-----#8 SubElement 1.2
Check X before that (The SuperProject)
    
```

```

###-- Displaying process overview

-Process Set-
----#3 The Super Process 1
-----Elements
-----#4 Element 1
-----SubElements
-----#5 SubElement 1.1
-----#8 SubElement 1.2
-----#10 SubElement 1.3
-----#11 Element 2
-----SubElements
-----#12 SubElement 2.1
    
```

Results (1/3)

- Difference in expertise
- How data should be selected and managed from a user-interface and usability viewpoint,
- Difficult to get an overview of the constraints in the process descriptions

Results (2/3)

- A graphical representation of modelled scenarios improved communication between the project members.
- Knowledge from domain experts from Callis were vital in the development

Results (3/3)

- Model did not disclose as many issues as were initially expected
- The model did not reveal any faults or inconsistencies
- Confirmed the anticipated behaviours
- The only real defect discovered in the existing tool was a risk of recursion in certain scenarios.

Future Work

- Full implementation of the proposed extension into the existing tool,
- Deployment of the extend tool in industry workshops

Questions?

