



Tools for Requirements Management

Group 2 - Andreas Schaufelbühl, Sacha Uhlmann
Requirements Engineering II - 12.12.2016.

Agenda

— — —

Motivation

Requirements for Requirement Management Tools

Requirement Management Tools and Product Lines

Discussion

Motivation

Mandatory readings show that adopting tool is difficult and affects productivity

To increase the benefits of a requirement management tool, the questions arise

- What does it actually need to support?
- Are there any specific considerations for product line development?

→ What are the requirements for requirement management tools?

Requirement Management Tools

— — —

Requirement Management Tools

- Are tools that support systematic requirement management
- Support acquisition, specification, grouping of raw requirements
- Support derivation to more detailed levels
- Enable creating and tracking relationships
- Enable distributed development within the organization
- Enable test case and environments to be defined and linked

Requirements for Requirement Management Tools

Context of reference-study (Hoffmann et al):

- Paper released in 2004
 - Automotive Electronics Development
 - Short life cycles
 - Strong competition and high cost pressure
 - Feature and requirements changes
- Focus on user friendliness, as effort required often perceived as higher than benefit of traceability

Requirements for Requirement Management Tools

Outcome of study: Requirements catalog for tools

- Total of ~ 100 requirements
- Hierarchically organized into
 - Stakeholders (Developer/ Project admin/ Tool admin)
 - Criteria
 - Requirements
- Prioritized into
 - High
 - Medium
 - Low

Requirements from Different Stakeholders

Developers Criteria

— — —

<u>High Priority</u>		<u>Medium Priority</u>
Information Model	Baselining	Analysis Functions
Views	Tool Integration	Import
Reformatting, Multimedia and External files	Document Generation	Web Access
Change Management and Comments	Collaborative Working on the Same Development Task	
Documentation of History	Checking out for Offline Use	

Requirements from Different Stakeholders

Project Administrator Criteria

— — —

<u>High Priority</u>	<u>Medium Priority</u>	<u>Low Priority</u>
Central Installation and Administration of Projects	-	Workflow Management
Users, Roles and Rights		
Size Restriction		
Extensibility		

Requirements from Different Stakeholders

Tool Administrator Criteria

— — —

<u>High Priority</u>	<u>Medium Priority</u>	<u>Low Priority</u>
Database	—	—
Encryption		

Requirement Management and Product Lines

Requirements for Product Lines typically

- Are more complex
- Live longer
- Have more critical dependencies
- Can differ in two products from product line

→ Commonality and Variability have to be tracked

Requirement Management and Product Lines

Different Requirements for Tools

Considered requirements based on previous introduced list

However, several new, refined and changed requirements

Examples for changed, refined and new requirements for existing criteria:

- Support for multi project/product status and reporting
- Definition of arbitrary, named subsets of requirements
- Baselineing more important

Requirement Management and Product Lines

Different Requirements for Tools

— — —

New Criteria

- Variability modeling
 - Support for multi product information models and expression of variability and variation
 - Multidimensional prioritization of requirements
 - Variant creation process
- Relationships to product and project management
 - Support product management by providing information about dependencies between features
 - Coordination of product, project and management to handle variability in requirements

Conclusion

There are requirements for Requirement Management Tools

- As all requirements, these are expected to evolve

Requirements in context of product lines are similar

Tool support for product line requirement management still limited

Discussion

— — —

What Requirement Management Tools have you worked with? Do these fulfill the discussed requirements?

What are the limitations of existing Requirement Management Tools?

Which functionalities do you consider important?

References

— — —

- Beuche, D., Birk, A., Dreier, H., Fleischmann, A., Galle, H., Heller, G., ... & Wolfram, A. (2007, September). Using requirements management tools in software product line engineering: the state of the practice. In Software Product Line Conference, 2007. SPLC 2007. 11th International (pp. 84-96). IEEE.
- Hoffmann, M., Kuhn, N., Weber, M., & Bittner, M. (2004, September). Requirements for requirements management tools. In Requirements Engineering Conference, 2004. Proceedings. 12th IEEE International (pp. 301-308). IEEE.

Appendix

— — —

Tools Evaluation

Requirement Management and Product Lines

Evaluation of Tools 1/2

Evaluation of existing solutions

- Authors evaluated, together with their industry partners
- Tools included
 - DOORS, CaliberRM, IRqA, RequiLine
- Evaluation values
 - 0 (don't know)
 - 1 (not supported) – 5 (perfect)

Table 2. Evaluation values and their meaning

Value	Semantics
0	Don't know.
1	The requirement isn't supported by the tool.
2	The requirement isn't supported in a way that is suitable for day-to-day operations. Custom solutions (extensions) are required (and possible) to address the requirement.
3	The requirement isn't supported adequately but it can be addressed with organizational conventions to use the tool in a specific way.
4	The requirement is addressed well enough to do daily work.
5	The tool's implementation of the requirement is perfect (at least we cannot imagine a better way of doing it).

Requirement Management and Product Lines

Evaluation of Tools 2/2

Key Results

- Views supported more or less
- Analysis function does not support product lines adequately
- Explicit information model, but only one has variability mechanisms
- Tools have configuration management support, but creation and tracking of dependencies between variants is only partially supported (or not at all)

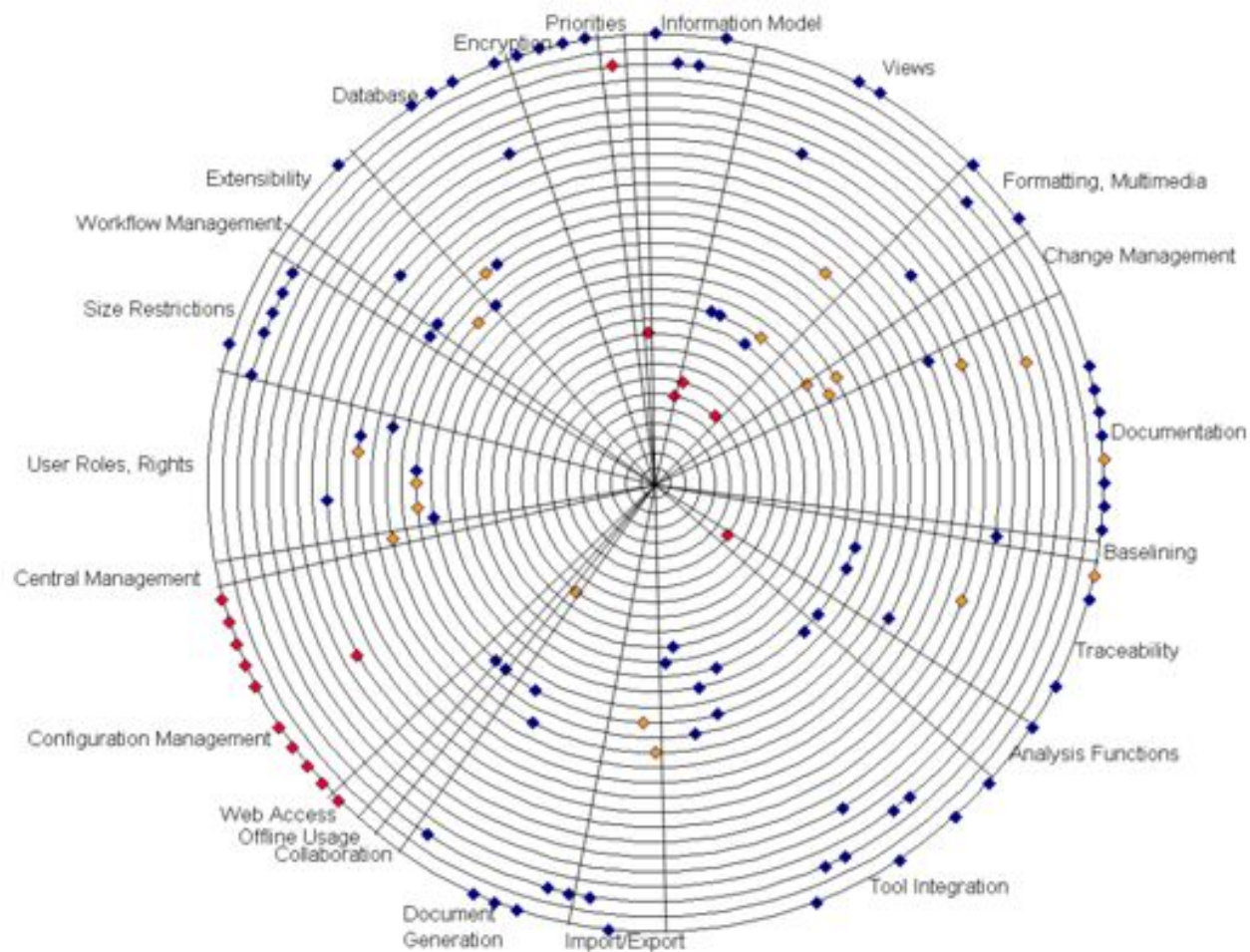


Figure 1: Prioritization of requirements in the context of product lines

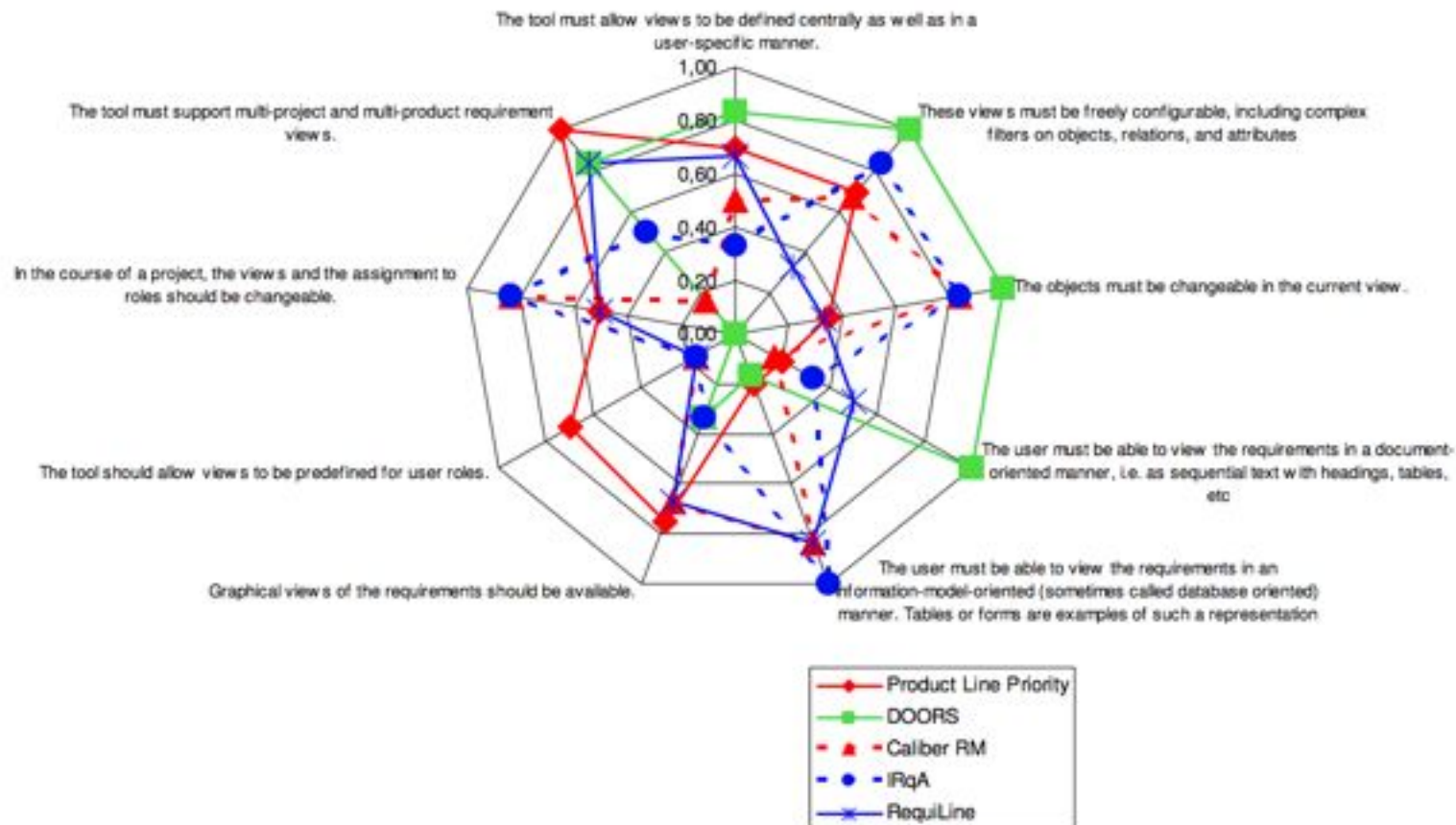


Figure 2: Evaluation overview of the category "View"