A Product Software Knowledge Infrastructure for Situational Capability Maturation: Vision and Case Studies in Product Management

Inge van de Weerd, Johan Versendaal & Sjaak Brinkkemper
Utrecht University

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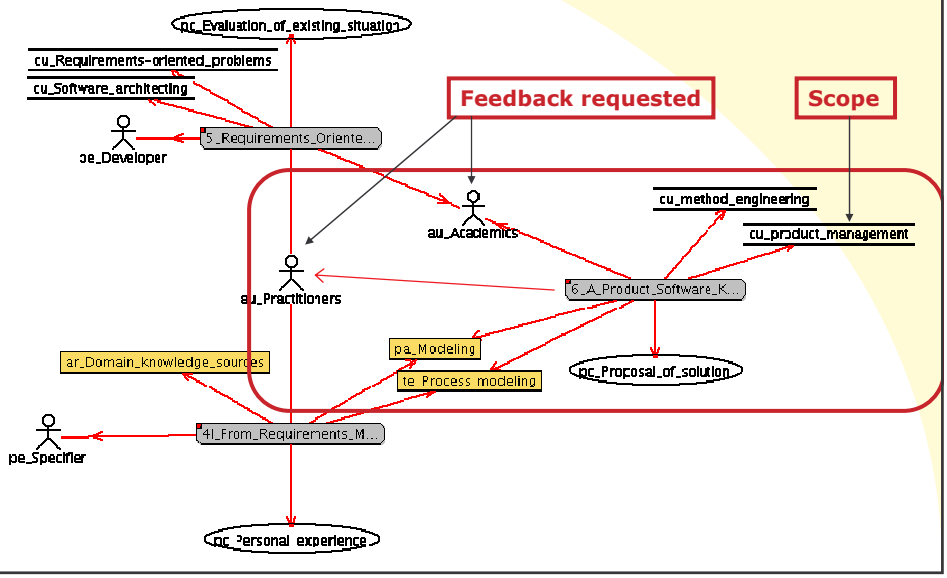
Context



Outline

1. Background
2. Scope
3. Research question
4. Product Software Knowledge Infrastructure
5. PSKI illustrated by case studies
6. Conclusions
7. Workshop discussion

1. Background

- Software is more and more developed and commercialized as a standard product
- Product software companies are highly dependent on the maturity of their software development processes
- Many examples of performance failures of product software releases
- Need for methodical support

2. Scope - software product management

- Much practical attention, but research in this area is fragmented
- Specific challenges compared to existing product management
  - organization of requirements and tracking of changes
  - high release frequency
  - the product manager has a lot of responsibilities regarding the product functionality, but does not have management authority over the development team

3. Research question

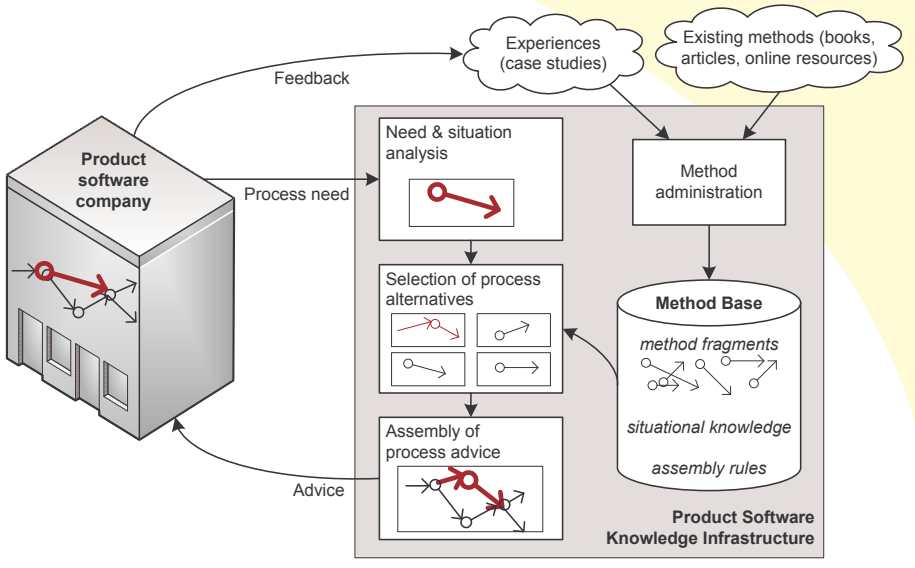
How can product software companies improve product management performance using concepts of situational method engineering and evolving maturity?

4. Product Software Knowledge Infrastructure

- A systematic collection of methodical knowledge for improving process effectiveness in a product software company

- Vision
  - Incremental method evolution
  - Company condition
  - Organizational culture

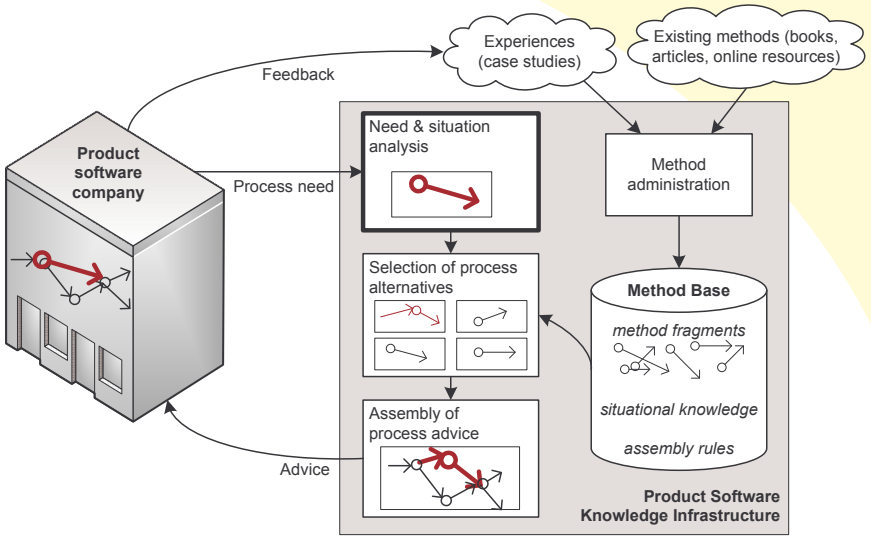
PSKI



5. PSKI illustrated by case studies

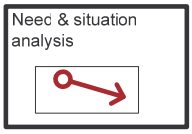
- 2 case studies at 2 product software companies
  - Interviews
  - Document study
  - Tool study

- Focus on release management and requirements management



Need

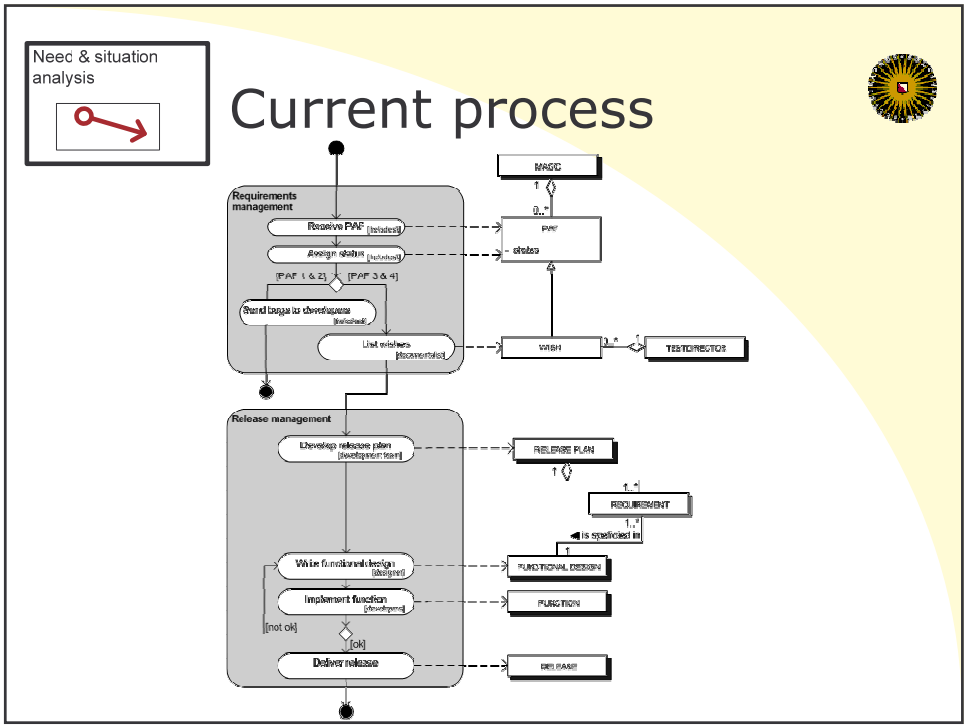
- Help with choosing requirements for the new release



Situational factor analysis

Company	Size	Age (y)	Req. rate	# customers	Tools
HRM Software	24	4	30-50 per month	600	Magic eContact Mercury TestDirector

- Which situational factors influence the method evolution?
  - Size
  - Requirements rate


Need & situation analysis
Current process
Requirements management
Release management
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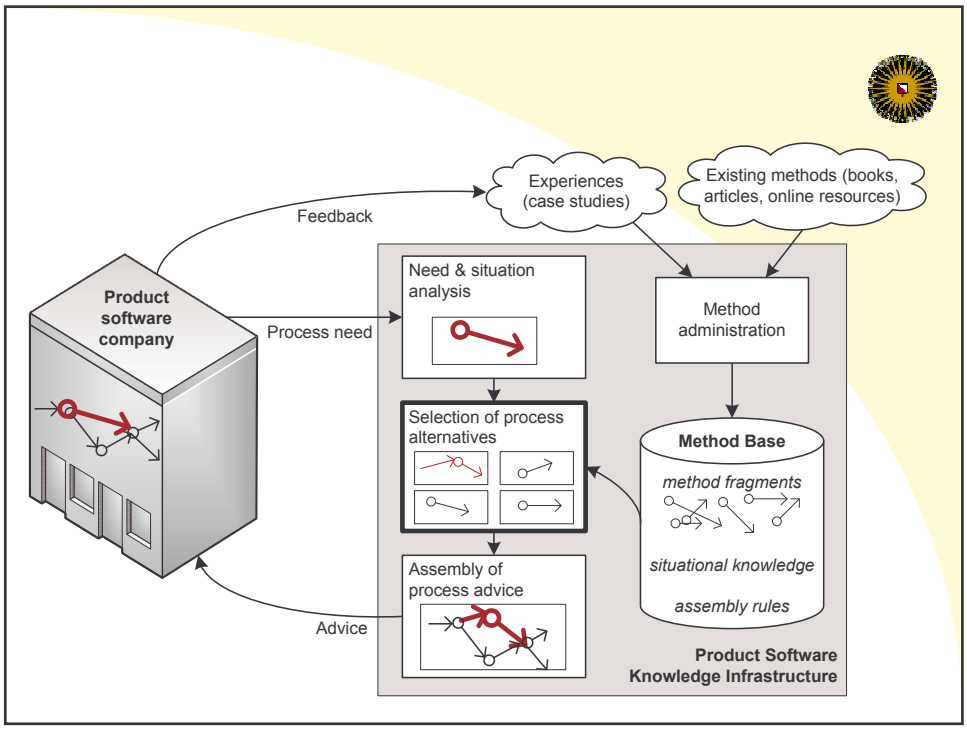
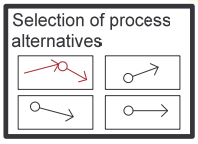

Experiences (case studies)
Existing methods (books, articles, online resources)
Feedback
Product software company
Process need
Need & situation analysis
Method administration
Selection of process alternatives
Method Base
method fragments
situational knowledge
assembly rules
Assembly of process advice
Advice
Product Software Knowledge Infrastructure

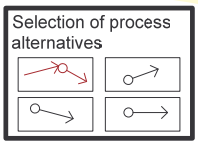
Capability analysis (1)

Capability	PM maturity level				
	1	2	3	4	5
Regulatory acceptance for release	x	x	x	x	x
Re-active customer needs determination for release	x	x	x	x	
Distribution partner determination	x	x	x	x	x
Scope change management	x	x	x	x	x
Release promotion determination	x	x	x	x	x
Prioritization of requirements	x	x	x	x	x
...	..	..	..	..	..



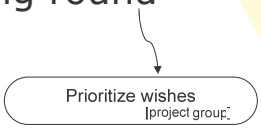
Capability analysis (2)

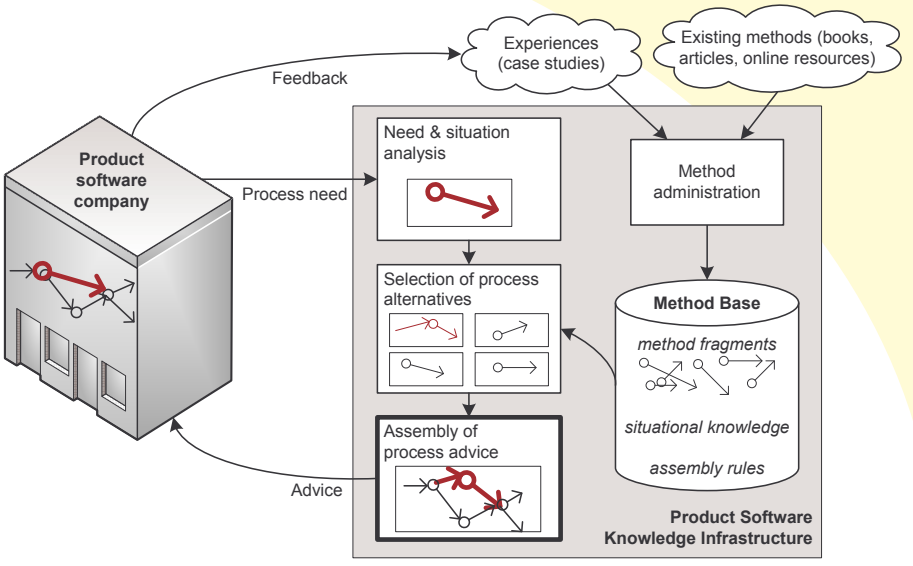
Capability: Prioritization of requirements	
Ad hoc	No prioritization
Release oriented	Prioritization per release
Product oriented	Prioritization per product
Organization oriented	Organization is actively involved in prioritization
Externally oriented	Customer and external partners are actively involved in prioritization



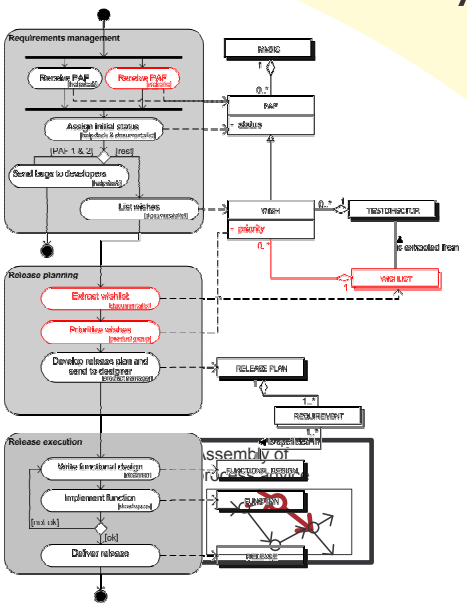
Alternatives

i. Prioritization using integer linear programming
ii. Prioritization using the analytical hierarchy process
iii. Prioritization using a voting round with the stakeholders
iv. …





Method assembly



Conclusions

How can product software companies improve product management performance using concepts of situational method engineering and evolving maturity?

- Vision on situational capability maturation in product software companies
- Introduction of the Product Software Knowledge Infrastructure
- Case studies provided us with:
  - method fragments to fill the method base
  - insight in the dependencies between maturity, method fragments and capabilities

Workshop discussion

- Which quality features are addressed by the paper?
  - process effectiveness
- What is the main novelty/contribution of the paper?
  - PSKI, incremental method evolution
- How will this novelty/contribution improve RE practice or RE research?
  - improvement of RE processes by incremental extension with best practices
- What are the main problems with the novelty/contribution and/or with the paper?
  - limited cases, no tool support yet
- Can the proposed approach be expected to scale to real-life problems?
  - yes, in case the PSKI can be implemented at full scale