An approach to Creating Design Methods for the Implementation of Product Software: The Case of Web Information Systems

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Overview

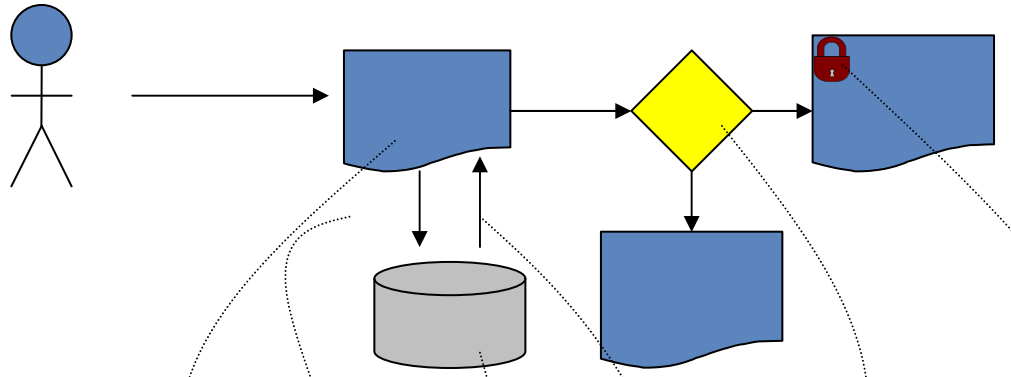
- Problem definition
- Association and Assembly approach
- Evaluation
- Conclusion and further research

Problem definition

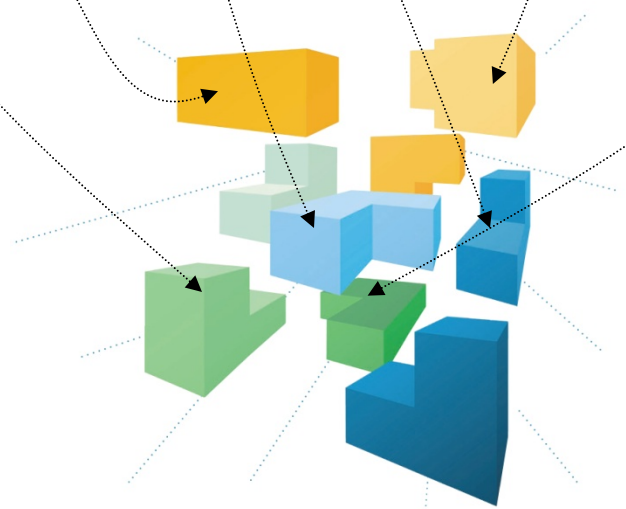
- The implementation of WCMS are **complex** due to **fast-changing** requirements
  - Affects costs of web application development
- Software vendors have difficulties in creating a **design method** to meet the **situational design context** of an **implementation project**
- No **generic** approach is available to support **product software design** aiming to create **maintainable** software designs for implementation projects
- **Many** web modeling languages available, but…
- …how to create a design method that fits your **domain** and your **product**?

Complexity of WCMS implementations

Web visitor perception



CMS-based web application



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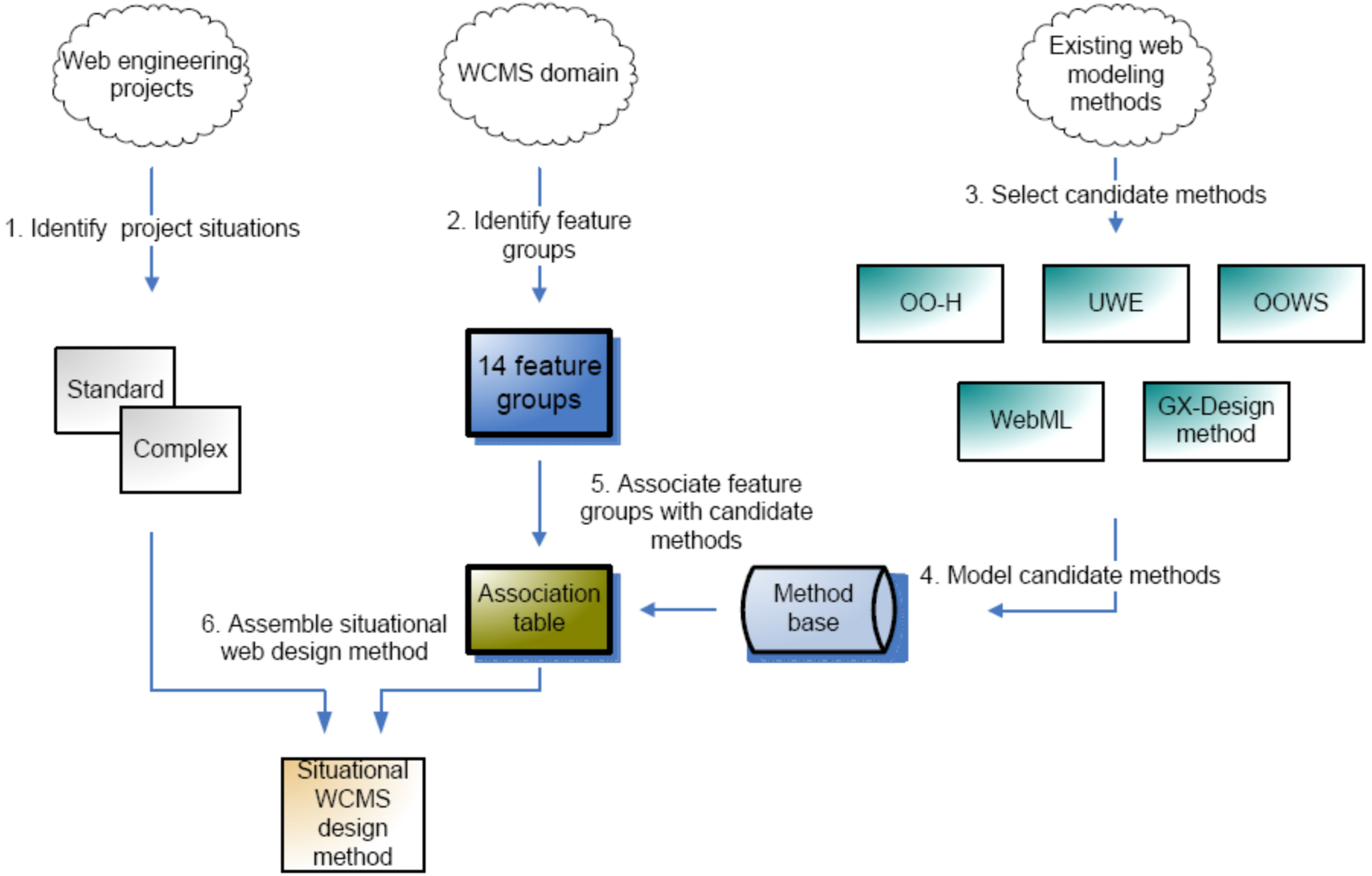
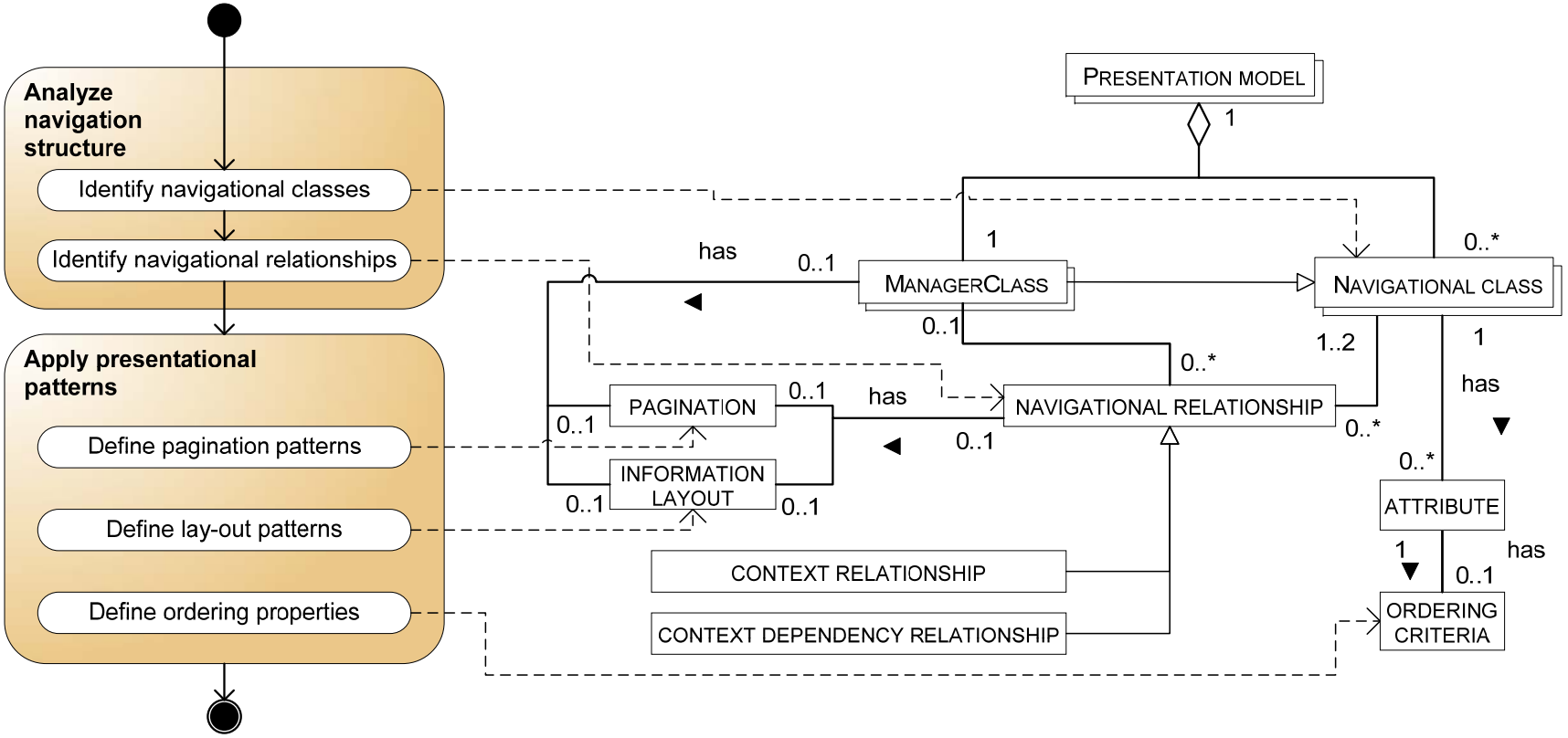
Association and Assembly approach



Step 3: select candidate methods

- **Many** methods: OO-H, UWE, WebML, OOWS, OOHDM, HDM, HDM-lite, W2000, Autoweb, WSDM, RMM, SOHDM, WAE, WAE2 etc...
- **Many** comparative studies performed aiming at various topics like requirements engineering and navigation modeling
- Selection of methods, based on the following criteria:
  - **Acceptation** in the web community
  - Extensive **tool support**
  - **In development**
- Selected: OO-H, UWE, WebML, OOWS and GX-Design method

Step 4: model candidate methods



- Process Deliverable Diagrams (PDD) by van de Weerd and Brinkkemper (2008)
- Method base (32 fragments; of which: 12 high-level)

Problem

- Which **WCMS functionalities** are addressed by current web modeling languages?
  - WCM domain established by means of feature groups
  - Web modeling languages have been selected and modeled
  - How to associate feature groups and methods?

Step 5: let's associate!

		OOWS										OO-H						
		Navigational model										NAD						
		Navigational map	Context	Navigational link	AIU	Search mechanism	Navigational class	Navigational relationship	Process context	Activity Container	Main-AIU	navigational target	Navigational node	Service node	Collection node	Class node	Link	OCL expression
E-Form	Step		x		x		x		x	x	x					x		
	Handler								x					x				
	Validation													x				
	Router		x	x					x									
	Field						x											
Personalization	Personalization rule	x	x			x											x	x
	User profile																	
	User access	x												x		x		

Step 6: assemble situational web design method

- **Situational web design method**

- Four main activities:
  - Conceptual design
  - Architecture design
  - Presentation design
  - Detail component design

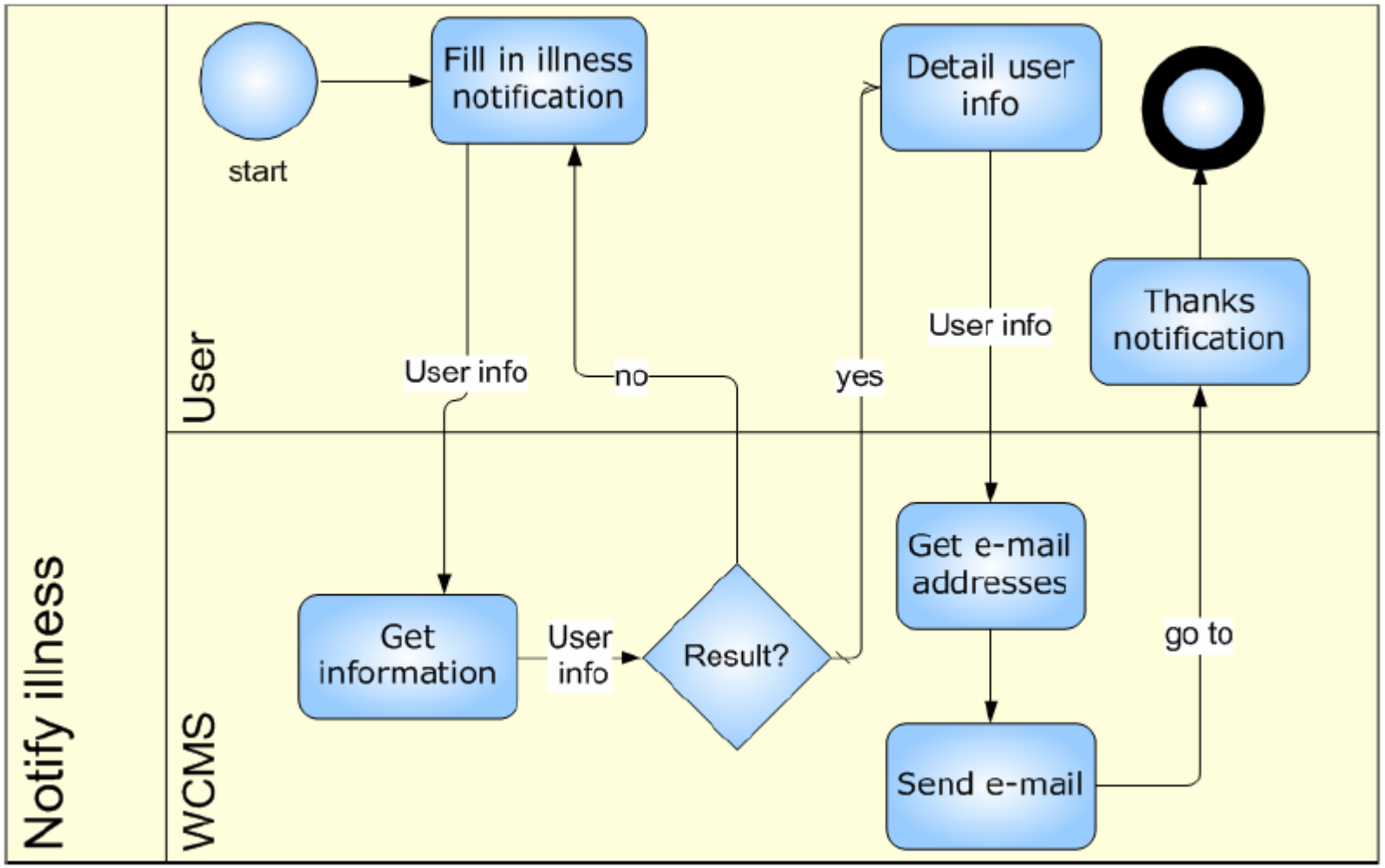
- Two route maps: **standard** and **complex** route

- Static analysis by means of the **quality measures** proposed by Brinkkemper et al. (1999)

Case study organization

- ISV of a Web Content Management System
- 120 employees
- Located in the Netherlands
- Customers: AFC Ajax, KPN, Asics, Schiphol Group, SNS bank, SBS Broadcasting and many more…
- Expert validation
- Two case studies performed to validate **conceptual design**
  - Design intranet for Dutch Governmental Organization (Gov)
  - Design personal space of a Dutch Telecommunications Provider (Tel) from a retrospective
- **Deliverables** of case studies: domain model (incl. description), user model, navigation model, business process model and change list

Example: business process model



Evaluation results

- The **process** of the situational web design method has been considered as **applicable**
- Consultants have **contradicting** perceptions about the **usefulness**, readability, abstraction level and correctness of the **navigation model**
- Consultants and engineers had **different** opinions about **tool support** for domain models in GX WebManager
- All respondents indicated that the user model should be **more integrated** in the domain model
- All respondents perceived **tool support** for the business process model as **very useful**

Conclusion

- A **situational method** for the design of WCMSs has been constructed and validation results were **positive**

- The **Association and Assembly Approach** is a helpful approach in assembling **domain** and **product specific design methods**

Discussion and further research

- Only the **conceptual design phase** has been validated by means of case studies…**more validation** is needed in similar and **different domains**!
- **Feature groups** might enable and can be fed by **Product Roadmaps**
- The application of **metrics** in order to support **method fragment selection**

Questions?

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