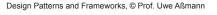


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11-0.1, 11/12/11

- 1)Using and writing patterns in companies
- 2)Successes of patterns



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6.1 Using and Writing Patterns in Companies

Literature (To Be Read)

- ► K. Beck, J. Coplien, R. Crocker, L. Dominick, G. Meszaros, F. Paulisch, J. Vlissides. Industrial Experience with Design Patterns Int. Conference on Software Engineering (ICSE) 1996
 - Beck First Class Software (consultancy)
 - G. Meszaros, BNR/NorTel (telecom)
 - Paulish & Dominick, Siemens
 - Crocker Mottorola
 - Coplien ATT
 - Vlissides IBM

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Patterns May Be Domain-Specific

- ► Telecom domain (Coplien, Meszeros)
 - Process and organizational patterns are very useful in larger teams
- Business domain
 - Banking
 - Adminstrative systems
- Problem domain vs solution domain
 - Patterns can be written for both of them
- ▶ How to come to these domain-specific patterns?
 - Solution: Experience Factory
 - · Write them yourself, for your own company
 - Building a catalogue of domain-specific or company-specific design patterns
 - And record them in an Experience Factory







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Pattern Writing is Hard

- Mesczeros identified three groups of pattern users in his company
 - People who are able to describe them (pattern gurus)
 - People who can recognize but not describe them (pattern users)
 - People who are oblivous about patterns (pattern ignorants)
- ▶ He observed that only a small percentage of people can write patterns
 - The distinction may arise from people focussing on different things:
 - On similarities as opposed to differences between things
- Pattern writing is an iterative process and should be pattern mining

Pattern Mining

- ► Patterns should be mined in interviews of domain specialists (Paulisch, Coplien)
- The pattern miner (pattern writer) should refine and polish the pattern
 - And then go out to the domain experts again
 - About 3 interviews are necessary (Paulisch)
- Sanity check:
 - The prototypical patterns should be presented to other groups that have not been involved in the process
- Paulisch used hypertext to publish the pattern catalogue



Pattern Miners

- Pattern miners consult product groups, i.e., are company-internal consultants
- It can be quite useful if pattern miners are not involved in the product groups,
 - since unconscious knowledge might exist in the group that can better be reflected from an outsider
 - They often do not know what they have done or cannot explain it
 - They often contradict each other in their assertions
 - Product group members are often so busy with their day-to-day work, that pattern mining does not work for them
 - They also need to learn how to write patterns
- Pattern miners must ask, listen and abstract
- Often, they reengineer the design decisions and their rationale, because they have been forgotten

Good Questions for Pattern Mining (Vlissides)

- Why did you design this way? [Rationale, Motivation]
- Is what seems to be complexity here really worthwhile? [Consequences]
- What are your assumptions? [Rationale]
- Why are your assumptions realistic?
- What happens 6 months from now when I need new feature F? [extensibility, variability]
- Hint: Ask these questions yourself, if you write a pattern





Success Criteria for Pattern Catalogues

- Domain-specific pattern catalogues seem to be successful if
 - they consist of a small catalogue of low-level patterns (may be idioms)
 - If the catalogue has more than 30 entries, tool support is desired
 - . (The GOF catalogue has about 30 entries!)
 - there is a single architectural (coarse-grain) pattern that describes the structure of the products
 - · Such as pipe-and-filter style
- A pattern catalogue needs a pattern mentor
 - That promotes the patterns within an organization
 - A master of the Experience Factory
 - This helps the organization to accept patterns

Success Criteria for Single Patterns

- ► They must be compact
- ▶ They must be mined from working designs
- They must be mined from "best practice"
- ► They need not be object-oriented

Prof. Uwe Aßmann, Design Pattems and Framewo

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.... everyone experiences....

6.2 Successes of Design Patterns

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... But Measuring Impact is Hard

- Communication is clearly simplified
- Programmers can master more complex designs
- Vlissides reports that he started to require that consulted groups read GOF
 - After this, the groups had a much better understanding of what was going on
- Engineers forget that they talk in patterns, after they have learned about them
 - Write me an email in 2 years from now, if you remember this statement
 - I will put you up on the courses home page
 - ... and may be invite you as a guest lecturer

Mining Forgotten Requirements

- ► A pattern can help to discover *forgotten requirements*
 - A design has a rationale from the requirements
 - If a pattern can be matched only partially in a design, this may indicate that some requirements were uncovered
 - Hence, reiterate on the requirements document
- Example:
 - A Mediator is discovered in a design
 - Usually, a Mediator enables dynamic reconfiguration of communication
 - If this requirement has not been fixed, discuss with the client whether he needs it

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- If not, you may simplify the design
- If yes, you argue for more money :-)





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The End

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