

Tailoring Knowledge Sharing to the Architecting Process

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Presentation outline

- **Why sharing architectural knowledge?**
- **Sharing architectural knowledge in practice**
 - Case study in large software organization
 - Key observations using four perspectives on the architecting process
- **Lessons learned**
- **Conclusions**



Why sharing architectural knowledge?

- **Software development benefits from knowledge sharing**
 - Emerging trends such as offshoring, virtual organizations and collaboration between closed and open communities
 - To stay up-to-date, share expertise, or exchange ideas, stakeholders have specific knowledge needs.
 - Face-to-face knowledge exchange is not always possible
- **Sharing architectural knowledge**
 - Software architecture considered as a set of design decisions
 - Decisions and their rationale is important architectural knowledge to store or communicate
 - Architectural knowledge that is not shared eventually dissipates



Sharing architectural knowledge in practice

- **Case study at large Dutch software organization**
 - Knowledge repository with best practices and guidelines
 - Repository guides architects in decision-making by generating first version of architectural description
- **Starting point of the case study**
 - Knowledge repository seldom used by architects
 - We have looked for the source of this problem
 - Focused on the organization's architecting process



Sharing architectural knowledge in practice

Case study sources used

1. Documentation study

- Architectural descriptions, technical and functional design
- Showed what kind of architectural knowledge exists

2. Questionnaire

- 27 use cases ranked by 15 architects
- Revealed preference for knowledge sharing

3. Interviews with in total 17 stakeholders

- Project managers, developers, architects, and maintainers
- Provided detailed information on the knowledge needs



Four perspectives on the architecting process

Four different perspectives on the architecting process:

1. Architecting environment
2. Decision-making
3. Architectural descriptions
4. Stakeholder roles and responsibilities

- **Provides a thorough view on the architecting process**
- **Based on each perspective a lesson was learned**



1. Architecting environment

- **Main customer organization puts constraints on architecture development**
 - Reference architecture defines borders
 - Local architecture department takes a lot of design decisions
 - Little room to deviate from these constraints
- **Repository lacks knowledge of customer organization**
 - The available repository assumes 'greenfield' situations
 - In practice often systems are extended or replaced
 - Knowledge about/within the customer organization is important, but is currently not shared



2. Decision-making

- **Not only architects take design decisions**
 - Customer organization often takes the early decisions
 - Development teams take a lot of technical decisions
- **Knowledge sharing between these stakeholders does often not take place**
 - No feedback from developers to architects
 - Developers have to explain technical design decisions to architects more than once



3. Architectural descriptions

- **Developers and maintainers consider information in the architectural description too high level**
 - Technical design documents suit their knowledge need better
 - But technical design documents and architectural descriptions are not aligned
- **Maintainers are targeted in the architectural description as a stakeholder, but they seldom read this document**
 - Some were not even aware of its existence



4. Stakeholder roles and responsibilities

- **Next to architects, developers have a central role in the architecting process**
 - They have a higher technical background
- **Architects ‘freeze’ the architectural description when the system is released**
 - Maintenance teams gain experience with what worked and what didn't.
 - This experience should be fed back to architects to update the ‘best practices’



Lessons learned

- 1 The architecting environment dictates what architectural knowledge is worth sharing.**
- 2 Knowledge sharing should be initiated by the stakeholder(s) responsible for decision-making.**
- 3 Knowledge shared by architectural descriptions needs to match the expectations of the intended audience.**
- 4 Knowledge should be shared between all stakeholders actively involved in the architecting process.**



Conclusions

- **Sharing knowledge on software architectures is only successful when the mechanisms are tailored to the architecting process.**

- **Tailoring knowledge sharing to the architecting process**
 1. Take the architecting environment into account
 2. Stimulate stakeholders to share 'their' decisions
 3. Let architectural descriptions address the knowledge need of stakeholders that use these descriptions
 4. Involve all stakeholders who are active in the architecting process



Questions?

