Risk Management during Development: Results of a Survey in Software Houses from Germany, Austria and Switzerland

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RISK Workshop
Motivation

- Developing software within budget and schedule requires elaborated decision making supported by risk information
- Holds especially for software houses
  - Companies whose primary products are software
- Investigation of state-of-practice important to derive guidelines

Results of a survey on risk management during development in software houses from Germany (D), Austria (A) and Switzerland (CH)
Contents

- Survey design and analysis
- Timeline of the survey
- Results
  - Reasons for not performing risk management
  - Application of risk assessment Results
  - Risk assessment criteria considered during risk management
- Synthesis with responses from interviews
- Synthesis with findings from literature studies
- Conclusion
Survey Design and Analysis (1/3)

- Quota sampling
  - Geographical location (Germany, Austria, Switzerland)
  - Number of employees (<=10, <=100, >100)
- Overall 57 companies were selected
  - 19 from each of the three countries
- With population size of roughly 90,000 a precision of 87% is achieved
  - “IKT-Branche in Deutschland” reports 61,029 companies
  - Austrian governmental statistical office reports 13,281 companies
  - Swiss federal statistical office reports reports 15,466 companies
Survey Design and Analysis (2/3)

- Questionnaire designed based on
  - Experience of Software Quality Lab
  - Experience of involved researchers
  - Big DACH survey Softwaretestumfrage 2011 and implemented in LimeSurvey
- Comprehensive survey with questions in areas
  - Process models
  - Release planning
  - Requirements engineering
  - Implementation
  - Testing
  - Risk management
Survey Design and Analysis (3/3)

- Internal and external validation by 6 employees from software houses
- Companies selected by Google maps searching for “software company”
  - 4% response rate for first round of email invitations (450)
  - 9% response rate for phone calls (200)
  - 3% response rate for second round of email invitations (500)
- Analysis performed in SPSS
- Survey data complemented by
  - 12 interviews with survey participants
  - data from systematic literature review on respective surveys
Timeline of the Survey

**February**
- collect requirements for the instrument
- setup and customize the online survey instrument
- explicit target audience characterization

**March**
- design sampling plan
- collect possible participants
- design and refine questionnaire
- distribute pilot test invitations (30.3 - 31.3)

**April**
- distribute survey announcement emails (1.4 - 7.4)
- perform pilot test (8.4 - 16.4)
- evaluate and consider feedback, adapt questionnaire (17.4 - 21.4)
- perform survey (21.4 - 4.5); (27.4) send reminder

**May**
- extend the survey because of low participation (5.5 - 22.5)
- analyze the results
- describe and summarize findings

**June**
- analyze the results (22.5 - 7.6)
- prepare email invitations and interviews (13.6 - 14.6)
- send out email invitations for interviews (15.6)
- conduct interviews (16.6 - 19.6)
- analyze interview results (19.6 - 28.6)
- describe and summarize findings
Demographics

- 57 software houses
- Homogeneous distribution over countries
  - 19 Germany, 19 Austria, 19 Switzerland
- Homogeneous distribution over size
  - 22 small-sized, 20 medium-sized, 15 large-sized
- Most common project types
  - 71% web applications
  - 61% individual software
  - 56% standard software
- Experience of participants
Process Models (N=57)

Process Assessment
- Somewhat Dissatisfied
- Neither Satisfied nor Dissatisfied
- Somewhat Satisfied
- Very Satisfied

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Risk Management during Development

- **26% (15)** of the software houses perform risk management in their software projects
  - Application of risk assessment results
  - Risk assessment criteria considered during risk management
- **58% (33)** of the software houses perform no risk management in their software projects
  - Reasons for not conducting risk management
- **16% (9)** did not know or provided no answer
Reasons for not Performing Risk Management (N=33)

- Lack of Resources: 48%
- No Necessity: 42%
- Lack of Knowledge: 33%
- No Time: 24%
- Unknown: 6%
Application of Risk Assessment Results (N=15)

- Prioritization of Test Cases: 73%
- Targeted Selection of Testing Methods: 53%
- Resource Allocation: 53%
- Definition of Test Criteria: 53%
- Evaluating Remaining Risks in Test Reports: 33%
- Unknown: 13%
Risk Assessment Criteria Considered during RM (N=15)

- Technical Product Risk: 93%
- Project Risk: 93%
- Business Product Risk: 67%
- Criticality: 60%
- Frequency of Execution: 27%
- Unknown: 7%
Responses from Interviews

- Interviewees that do not apply risk management responded that
  - they are not convinced by the idea of it
  - it does not fit to agile development
- Interviewees that apply risk management responded that
  - it helps them to assess priorities of the requirements
  - give tests more importance
  - decide which requirements should be part of the next release

The main application area of risk management is to prioritize activities
Findings from Literature Studies

- Literature review performed via forward and backward snowballing based on initial studies which delivered overall 28 results.
- Common reasons for not applying risk management (Haberl, 2011):
  - Missing methodological skills
  - Insufficient resources
  - No necessity for it
  - No time for it
- At least two-third of companies (not only software houses) perform risk management (Haberl, 2011).

*The most common reasons to not apply risk management are a lack of resources, missing necessity and lack of knowledge.*
Conclusion

• Survey on risk management during development in 57 software houses from Germany, Austria, and Switzerland

• Results
  • The most common reasons to not apply risk management are a lack of resources, missing necessity and lack of knowledge
  • The main application area of risk management is to prioritize activities

• Measures
  • Awareness for need of risk management in software development
  • Evidence-based guidelines for efficient and effective risk management are required