How can Open Source Software Development Help Requirements Management Gain the Potential of Open Innovation: An Exploratory Study

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Different facets of agility

Faster development

or

Faster decisions on WHAT to implement
Growing complexity

SPL and reuse
The problem

• Achieving and sustaining competitive advantage is becoming more and more challenging

• Maximize ROI → identify most profitable functionality

• Traditional requirements identification has focused on internal stakeholder interaction

• Recent changes force companies to “learn how to play poker as well as chess”
Open vs. Closed innovation - definitions

• Closed innovation – focusing on internal stakeholder interaction – analysis, research and development followed

• Open innovation – “the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively”, Chesbrough

• Open innovation is more than using OSS
Why we studied open innovation

• Studied by several researchers from the business management perspective
  • corporate venturing and valuation
  • technology transactions
  • ‘high-technology’ industries
  • large organizations

• No study has attempted to investigate the role of open innovation in requirements management and requirements decision making

• Main research question: “Is the current requirements engineering process designed to facilitate from open innovation?”
Research methodology & Case company

• The company – large, global, undergoing transition from a waterfall-based methodology to an agile methodology
  • Continuous release planning
  • Cross-functional teams
  • Iterative dealing with requirements
  • Integrated requirements management
• About 10000 features in the database
• Uses software product lines
Research methodology & Case company

• Semi-structured interviews with 19 participants
• The results were grouped into 12 clusters, labeled and assigned summary statements
• 12 clusters were presented to high-level management
• Next, four respondents agreed or disagreed with identified 12 clusters
Validity

- Description validity – we recorded and transcribed the interviews
- Theoretical validity – reviewed the interview guideline, took precautions that the interviewer expressed neutrality
- Generalizability – strongly limited due to qualitative one company study – we sampled representative individuals
Results – contribution to the OSS community

• Unclear content and contribution strategy (S1)

• Unclear contribution timeline (S2)

• Minimize modifications to the open source code (S3) – risk of maintenance effort

• Unclear relationship between the benefits from contributions in terms of strategy and business goals (S4) – competitors are more successful and contribute less

• Be strategic when adopting innovative features (S5) – sometimes it is better to be ‘the second’ on the market
Results – process and innovation

• Augmenting requirements management process (S6) - “you get locked in, with the agreed functionality sometime ahead”

• Manage innovative features in a separate process (S7) – the process is designed for handling mature concepts

• Top-down or bottom-up open innovation (S8)
Results – release planning and prioritization

• Prioritization process needs modifications (S9) – problems with estimating cost and market/business value

• Hard acceptance criteria kills innovative features (S10) – innovative features are rejected during the prioritization process due to their immaturity

• Need for special flow for innovative features (S11)

• Release planning more challenging (S12)
Discussion – areas for further research

- **Requirements management process for open innovation** – support requirements identification, execution and contribution. Understand the balance between limited and generous contribution strategies.

- **Revisit release planning and prioritization models** - how these tasks can be more effectively performed in open innovation contexts.
Questions