



Usability and OSS Development with Company Involvement

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The Importance of OSS

Open source software has become part of
everyday life

- ▶ No software development company can neglect the open source software phenomenon



The Relationship to OSS

Utilizer of *OSS products*

- ▶ Active participant in OSS projects

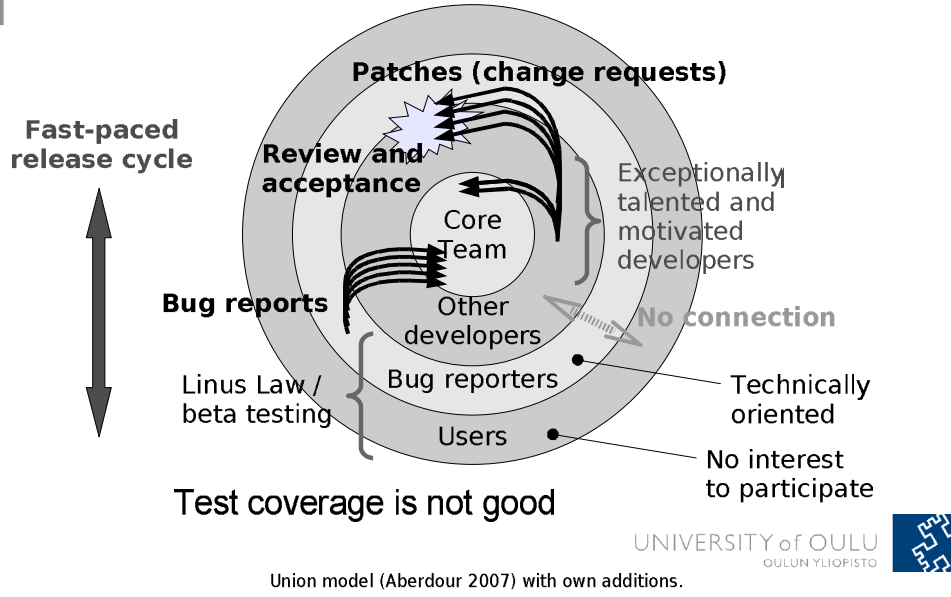


The Promise of OSS

Researchers try to explain
the success of OSS

- ▶ Is OSS **really** a silver bullet?

Quality Assurance in OSS Development



Quality in OSS

"Traditional" software development has used *quality assurance methods* for decades

- ▶ How are those methods adapted to OSS context and philosophy?

Usability in OSS

Originally OSS was made *for developers themselves*

- ▶ Now, OSS is used more and more by non-technical end-users

A New Viewpoint Is Needed

Knowledge about users *should drive the project*

- ▶ The technology-oriented structure must be extended with the usability viewpoint



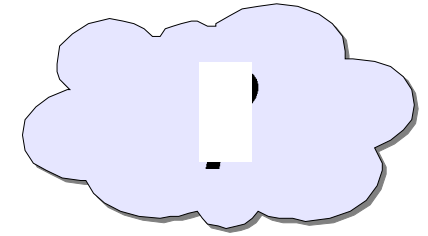
UMSIC Project

The aim of this multidisciplinary and transnational EU-project is *to develop and use up-to-date technology* in a coordinated, intelligent and accessible way to support children's social inclusion

- ▶ University of Oulu is coordinating OSS development in the project



Researchers



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Culture anthropology and usability background

Usability and OSS Development with Company Involvement

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Overview of the Presentation

- └ Motivation
- └ Usability
- └ Case studies on OSS development
- └ Empirical findings
- └ Discussion

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Motivation

- Originally, OSS developed by developers for themselves, to serve their particular needs
- All users potential developers -> 'user-driven' approach, user involvement important?
- Different types people involved
 - Leader, core team member, active developer, peripheral developer, bug fixer, bug reporter, reader, passive user (Ye & Kishida 2003)
 - Increasing number of 'passive users'
- Usability of OSS poor
- Usability becoming an important research topic

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Usability

- └ Learnability, efficiency, memorability, errors and satisfaction (Nielsen 1993)
- └ The extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use (ISO 9241 1998)

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Developing Usability

- Practical guidance on developing usability, numerous HCI methodologies supporting
 - Gaining an understanding the users, their tasks/work practices, and the context of use
 - Empirical inquiries
 - State of the art HCI knowledge
 - Carefully redesigning the tasks/work practices based on the understanding
 - Designing HCI solutions
 - Evaluating the solutions
 - Empirical user feedback
 - Feedback based on the state of the art HCI knowledge

Developing Usability

- User involvement
 - Informative, consultative, participative (Damodaran 1996)
 - Indirect user involvement: users represented by some sort of intermediaries, e.g. HCI specialists, who are responsible for or facilitate
 - Gaining understanding of the users, their task/work practice redesign, producing design solutions, evaluating the solutions
 - Informative, consultative, participative, decision-maker

Usability and OSS Development

- Strengths in OSS development
 - Bug reporting and feature request systems, mailing lists, discussion forums, chat... available for user-developer cooperation
 - Users deliver input and feedback
 - Developers provide user support
 - Large number of users -> a huge resource for bug reporting, for gathering user feedback and for empirical usability testing

Usability and OSS

- Challenges in OSS development
 - Little or no 'non technical' user involvement
 - Little or no HCI specialist involvement, developers reluctant to give them decision making power, no respect or authority
 - The developers lack HCI knowledge and knowledge about the users
 - OSS development in contrast with HCI methodologies?

Usability and OSS

- Companies can offer
 - Professional HCI specialists
 - HCI guidelines
 - Usability testing, user feedback
 - User studies
- Problems, e.g.
 - Company-community cooperation
 - Combining OSS development with HCI methodologies
 - Overall lack of research

Case studies on OSS development

- An interpretive case study on a usability oriented OSS project to understand how usability is understood and dealt with
- The OSS project
 - Desktop application for entertainment purposes
 - Clear interest in usability
 - Small but active project

Case studies on OSS development

- Usability discussion forum
 - 1600 messages, 400 topics (feature requests 30%, problems 20%, helping 10%)
 - Newbies 282, guests 274, members 23 (2 developers)
 - Active discussions
- Analysis of the meanings attached to 'usability', focusing on two aspects
 - What is meant by usability
 - How it is dealt with

Case studies on OSS development

- An interpretive case study in the company OSS development context to understand how usability is understood and dealt with
- The case
 - A SW development unit of a large, global corporation that has been involved with OSS development for few years
 - Strong background in usability and UI work
 - A rich setting providing data on combining the worlds of commercial SW development, OSS development and usability and UI work

Case studies on OSS development

- Multiple methods for data gathering
 - Theme interviews (managers, developers, HCI specialists)
 - Field notes from joint meetings organized in the unit with the management
 - Additional material; blogs, websites
- Initial analysis focusing on how usability is dealt with in the company OSS development
- More thorough analysis related to meanings attached to usability, OSS development and their relationship in the future

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Aspect	Empirical Findings
Defining usability <ul style="list-style-type: none"> - Effectiveness, efficiency and satisfaction - Learnability, efficiency, memorability, errors and satisfaction 	Usability is ... <ul style="list-style-type: none"> - Effectiveness, efficiency, satisfaction, learnability, consistency and intuitiveness - Related both to appearance and behavior - Related both to usefulness and ease of use - Feature to be implemented

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Aspect	Empirical Findings
Developing usability <ul style="list-style-type: none"> - Understand the users, their tasks, the context of use - Redesign the tasks - Evaluate the solution - Involve the users (informative, consultative, participative) - Involve the HCI specialists (informative, consultative, participative) 	Usability is developed by ... <ul style="list-style-type: none"> - Understanding the users, their tasks, the context of use through the discussion forum, but few users describe these issues - No explicit user task redesign - Evaluation through gathering user feedback in the discussion forum - Involving the users in consultative role - Calling for HCI specialists to contribute in a consultative role

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Usability in an OSS project

- Problems in developing usability
 - The developers do not have much knowledge of the 'non technical' users
 - The scarce knowledge they have is based on the discussion forum, in which the 'non technical' users might not participate at all
 - The novice users, non technical users and typical users are discussed in the discussion forum, but there is a lack of empirical evidence and clearly some of them are constructed only to serve the purposes of the message senders
 - Only consultative role for non technical users and HCI specialists

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Usability in an OSS project

- Strengths in developing usability
 - Usability dealt with and users involved in OSS development, but without commonly acknowledged terminology or methodology
 - Users capable to express themselves in the discussion forum -> provide valuable, detailed data about themselves, their tasks and the context of use -> utilization in other contexts?
 - Extensive user support provided
 - HCI specialists seemingly having a lot of respect and authority

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Aspect	Empirical Findings
Why OSS	<ul style="list-style-type: none"> • Used as part of the commercial products • Reduced development time • Allows more time to innovate new things • Enables learning, knowledge sharing
How OSS	<ul style="list-style-type: none"> • Alternatives searched and evaluated • The chosen one tested, bugs fixed and the solution developed further • The results given back to the community • Legal checks, licenses, patents -> investigations too expensive and complicated compared to benefits? • UI tended to remain closed source

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Aspect	Empirical Findings
Why usability	<ul style="list-style-type: none"> • Extremely important: competitive edge, brand, image • Company investments in usability
How usability	<ul style="list-style-type: none"> • No empirical inquiries on users, their tasks/work practices, the context of use, HCI specialists produced descriptions of users based on their expertise • HCI specialists redesigned the tasks/work practices based on these descriptions • HCI specialists produced UI design solutions • HCI specialists evaluated the solutions, gathered user feedback

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Aspect	Empirical Findings
OSS-> usability	<ul style="list-style-type: none"> • Allows more time for usability • Enables early evaluation with the finished SW • Enables late changes • OSS community enables easy and cheap access to users
Usability->OSS	<ul style="list-style-type: none"> • Companies provide professional HCI specialists (usability, UI design) • Difficult to provide usability support for OSS projects, no effects on the solution • Patents and licenses cause problems, also usability as a competitive edge may result in UI remaining closed source

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Usability in Company OSS Development

- Company involvement can ensure that usability is dealt with and users involved in OSS development
- Potential problems
 - OSS community does not necessarily provide access to the 'non technical' users
 - The HCI specialists may replace the real users; they may alone produce the descriptions of the users and evaluate the solutions
 - Only consultative role for the users
 - OSS projects may not be interested in usability improvements

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Usability in Company OSS Development

- UI may remain closed source?
 - UI and usability the competitive edge
 - May cause anger in the community, deteriorate the relationship
 - Emphasizes the importance of the field of HCI
- The role of non technical users and HCI specialists in OSS development
 - Informative, consultative or participative role?
 - HCI specialists needed, since the non technical users not equally equipped to participate in the discourses on technological development (cf. Asaro 2000)

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Open Source Software Development

- Open issues
 - ⇒ User involvement only bug reporting and usability evaluation?
 - ⇒ Only consultative user and HCI specialist involvement?
 - ⇒ Support for distributed HCI work?
 - ⇒ User involvement and usability methods and tools for OSS context?
 - ⇒ OSS development with company involvement and the role of users?

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