Ethnography in Global Software Development

Volker Wulf

Information Systems and New Media
University of Siegen
Prof. Dr. Volker Wulf

Agenda

- Qualitative Research in GSD
- In-depth Qualitative GSD Studies
- CSCW Concepts in GSD
- Design Case Studies in GSD

Empir Software Eng
DOI 10.1007/s10664-012-9240-x

Data collection in global software engineering research: learning from past experience

Rafael Prikladnicki • Alexander Boden • Gabriela Avram • Cleidson R. B. de Souza • Volker Wulf

Abstract Global Software Engineering has become a standard in today's software industry. Research in distributed software development poses severe challenges that are due to the spatial and temporal distribution of the actors, as well as to language, intercultural and organizational aspects. These challenges occur in addition to "traditional" challenges of the

Characteristics of Qualitative Research in GSD

- Conducting qualitative research in GSD context can be challenging (Prikladniki et al. 2013)
  - Usual challenges are aggravated by geographic, cultural, organizational barriers (e.g. trust needs to be build in multiple teams, access more difficult)
  - New challenges occur and can influence the work of the researcher (e.g. cultural differences, language issues, software technical competency)
  - Software practices are not easily visible , complex, difficult to observe
- At the same time, CSCW methods and theoretical concepts allow to obtain a more in-depth understanding of distributed collaboration (e.g. making invisible work visible)

In-depth qualitative GSD studies

- For a long time, there have been few in-depth qualitative studies on GSD practices
- Recently, studies have been conducted that provide detailed views on collaborative work (IST, Special Issue 2012)
  - From the different perspectives of collaborating teams
  - Over longer periods of time, understanding GSD as a *process* (instead of a decision)
- This talk aims at providing an overview on work that has been done, based on examples from the literature

CSCW concepts in GSD

- Articulation Work in GSD
- 3 C's practices in GSD
- Awareness practices in GSD
- Knowledge Sharing practices in GSD
- Trust and Social Capital in GSD

Articulation Work in GSD

- Articulation Work in Software Development
  - regulates the distribution of tasks
  - kind of detailed supra-work that mediates cooperative work arrangements
- Articulation Work in distributed work environments
  - becomes more complex
  - formalization is no solution for the arising problems
  - easing the informal communication

- E.g. “Coordination Practices in Distributed Software Development of Small Enterprises” (Boden et al. 2007)
- E.g. “Figure out How to Code with the Hands of Others: Recognizing Cultural Blind Spots in Global Software Development” (Matthiesen et al. 2014)

3 C's practices in GSD

- Coordination and Communication as important parts of Collaboration (3 C'S)
  - Communication necessary for Coordination
  - Coordination necessary for Collaboration
- In Distributed environments, communication is hindered
  - Less frequent
  - Subject to cultural barriers (language etc.)
  - Less rich due to reliance on digital media

- E.g. "An Empirical Study of Global Software Development:
  Distance and Speed" (Herbsleb,, Finhold, Grinter2001)
- E.g. "Divergence and Convergence in Global Software Development: Cultural Complexities as Social Worlds" (Jenson & Bjørn 2012)

Awareness in GSD

- Awareness as *implicit* form of coordination important for collaborative work
  - Workers monitor each other and adapt their work without need for explicit communication
- In distributed collaboration, awareness can be negatively impacted
  - Problems of information overload and privacy issues in technical support systems
  - To whom should awareness been distributed? And who should be monitored?

- E.g. “The Awareness Network, To Whom Should I Display My Actions? And, Whose Actions Should I Monitor?” (De Souza & Redmiles 2011)

Knowledge sharing in GSD

- Knowledge sharing important for organizational learning and innovative projects
  - Tacit and implicit forms of knowledge difficult to share with other workers
  - Shared practice as important concept
- In distributed work, knowledge sharing is hindered
  - Knowledge brokers as “bridges” between distributed teams
  - Regular meetings and frequent communication

- E.g. “Knowledge Work Practices in Global Software Development” (Avram 2007)

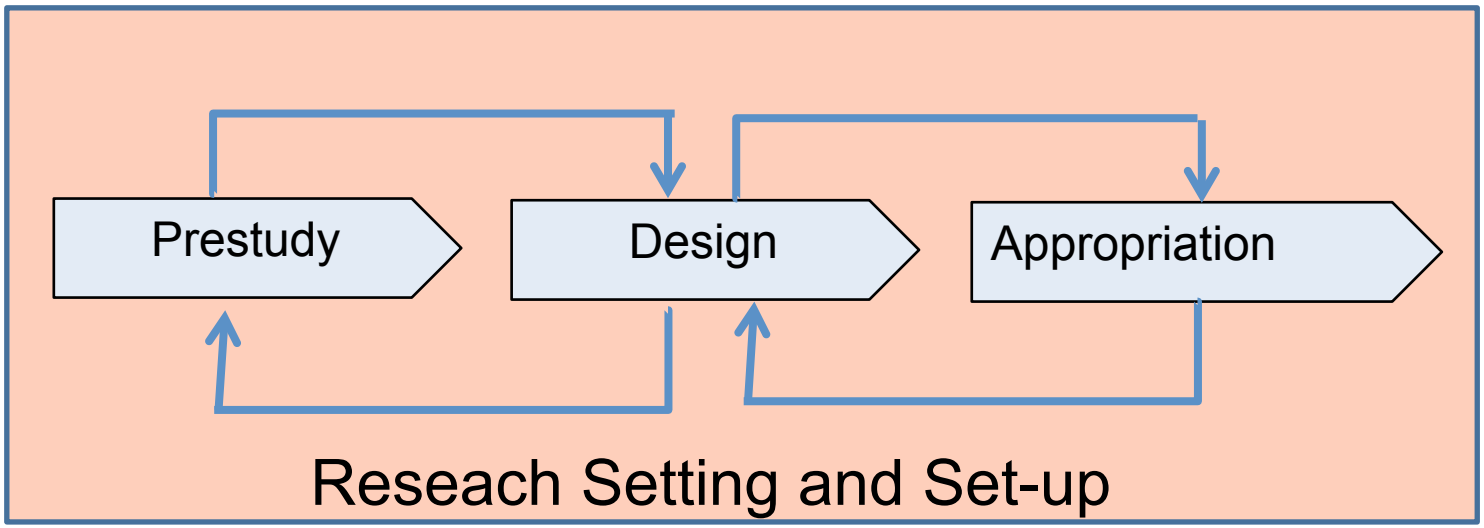
Trust and Social Capital in GSD

- Trust and Social capital as foundations for collaborative work
  - High levels of trust make it possible to discard control mechanisms
  - On the downside, high levels of trust can have negative impacts when it makes it harder for outsiders to enter the cooperation
- In distributed teams, trust is usually harder to build
  - Team members don't get to know each other personally
  - Us vs. them mentality

- E.g. "Trust and Social Capital: Revisiting an Offshoring Failure Story of a Small German Software Company." (Boden et al. 2009)
- E.g. "Understanding a Lack of Trust in Global Software Teams: A Multiple-case Study" (Moe & Smite 2008)

Moving towards Tool Support: Design Case Studies (Wulf et al. 2011)

- Empirical analysis of given practices in a specific field of application,
- (Participatory) Design of an innovative ICT artifact related to the findings of the empirical analysis
- Investigation into the appropriation of the ICT artifact over a longer period of time.



Research Issues

- Concept building on relevant aspects of software building practices
- Design work on tools in support of GSD:
- Participatory design methods across culture, time zones, langues etc
  - Pre- und post roll-out participation
- Understanding the appropriation of (GDS supporting) software across social context

Studies

- Avram, G. (2007): “Knowledge Work Practices in Global Software Development”
- Boden, A. ; Nett, B.; Wulf, V. (2007): “Coordination Practices in Distributed Software Development of Small Enterprises”
- Boden, A.; Nett, B.; Wulf, V: Operational and Strategic Learning in Global Software Development - Implications from two Offshoring Case Studies in Small Enterprises, in: IEEE Software, Vol. 27, No. 6, 2010, 58 - 65
- Boden, A.; Avram, G.; Bannon, L.; Wulf, V.: Knowledge Sharing Practices and the Impact of Cultural Factors: Reflections on Two Case Studies of Offshoring in SME, in: Journal of Software Maintenance Vol. 24, No. 2, 2012, 139-152
- De Souza, C.R.B. & Redmiles, D.F. (2011): “The Awareness Network, To Whom Should I Display My Actions? And, Whose Actions Should I Monitor?”
- Herbsleb, J.D. et al. (2001): “An Empirical Study of Global Software Development: Distance and Speed”
- Jenson, R. E. & Bjørn, P. (2012): “Divergence and Convergence in Global Software Development: Cultural Complexities as Social Worlds”
- Matthiesen, S. et al. (2014): “Figure Out How to code with the hands of others: Recognizing Cultural Blind Spots in Global Software Development”
- Moe, N. B. & Smite, D. (2008): “Understanding a Lack of Trust in Global Software Teams: A Multiple-case Study”
- Rafael Prikladnicki; Alexander Boden; Gabriela Avram; Cleidson R. B. de Souza; Volker Wulf: Data Collection in Global Software Engineering Research: Learning from Past Experience, in: Empirical Software Engineering, Vol. 18, 2013, in press
- Wulf, V.; Rohde, M.; Pipek, V.; Stevens, M.: Engaging with Practices: Design Case Studies as a Research Framework in CSCW, in: Proceedings of ACM Conference on Computer Supported Cooperative Work (CSCW 2011), ACM-Press, New York 2011, 505-512