Measuring Adoption of Open Source Software and Practices in Organizations

A Pilot Study

Georg Link, Jerry Gill, Deepak Khazanchi

Presented by Georg Link

MWAIS, Springfield, IL, 05/18/2017

Open Source

- Open Source
  - Software: Apache, Linux, Postgresql, etc.
  - Processes: Open docs, Transparancy, Asynchronous tools
- Advantages to business
  (Germonprez et al. 2013; Wesselius 2008)
  - Shared costs
  - reduced risk
  - faster development and innovation
  - Inner source (Ayala et al. 2011; Torkar et al. 2011)

Agenda

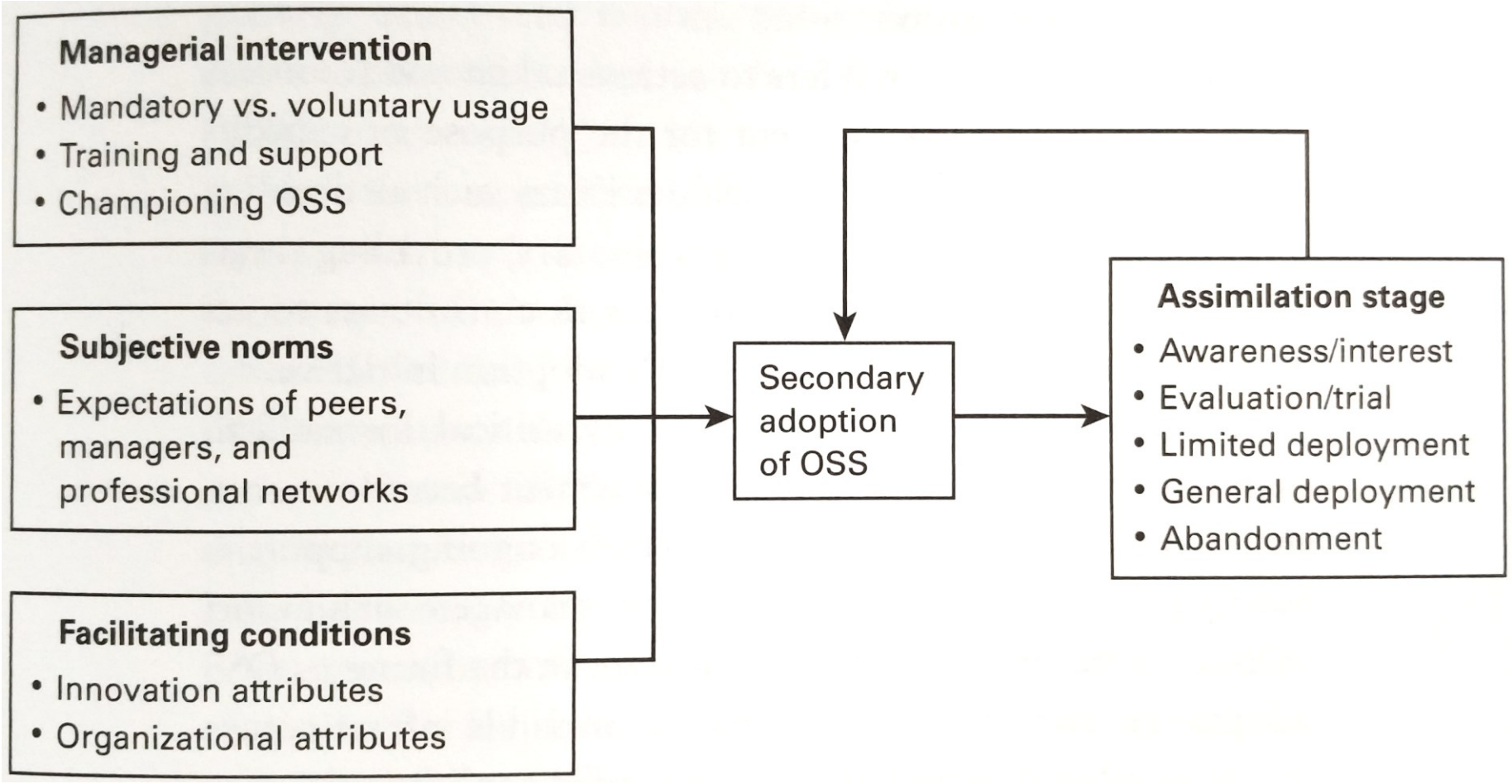
- Background: Organizational OSS/P Adoption
- Research Question
- OSS/P Adoption Instrument Development
- Pilot Study
- Conclusions

Organizational OSS/P Adoption

- Spreading quickly (Black Duck 2016)
- Much qualitative research (Thanasopon 2015)
- Decision Factors (Dedrick and West 2004; Johnston et al. 2013)
  - Long-term support
  - Internal resources
  - Performance
  - Cost
  - Freedom

Framework for Studying OSS/P Adoption

(Fitzgerald et al. 2011, p. 15)



Research Question

- How can the level of OSS/P adoption in organizations be assessed?

Our Definition of OSS/P Adoption

- When employees engage with and contribute to open source communities
- or when their internal software development practices are similar to those used by open source communities.

Operationalization

- Build on adoption literature
  (Howison and Crowston 2014; Thanasopon 2015; Torkar et al. 2011)
- Survey instrument
  - Involvement – participation in OSS communities
  - Transparency – openness within the organization
  - Practices – software development practices
- Respondents: IT department employees
- OSS scholar reviewed instrument

Pilot Study

- Telecommunications Company
- 23 respondents
- Gathered over one week
- Engineering Infrastructure Groups
  - Middleware
  - Software Development
  - Telecommunications

Measurements

- Web based survey
  - Limited sample, but reliable.
    - Cronbach's α=.817
    - mean inter-item correlation: .293
  - Personal participation – removed: 11 items, α=.832
  - Subscales
    - Involvement: 5 items (α=.784)
    - Transparency: 2 items (α=.771)
    - Practices: 4 items (α=.458)

Instrument refinement

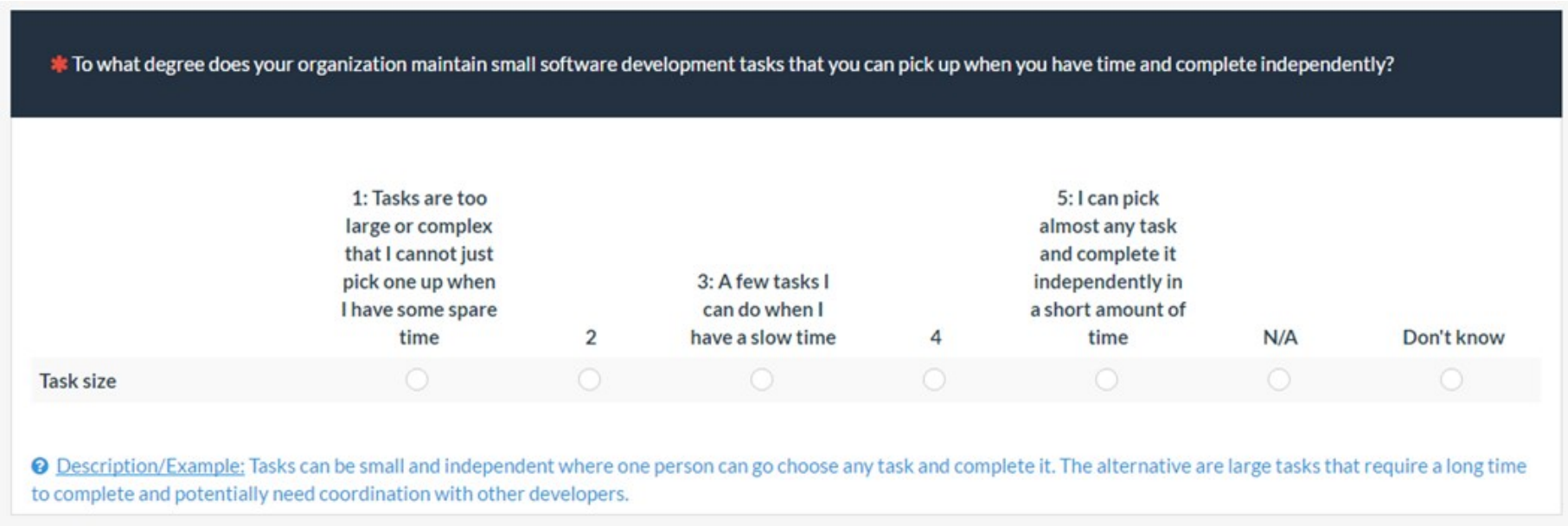
- Follow up interviews
  - Explanations were ignored by participants
  - Ambiguous terms
    - Change stack
    - Technical debt
  - Communications
    - Asynchronous and synchronous communication

Ambiguity

"To what degree does your organization maintain a ***change stack*** for open source software it uses?"

"To what degree does your organization use ***asynchronous*** tools, such as emails, to make software development related decisions?"

Survey Design



* To what degree does your organization maintain small software development tasks that you can pick up when you have time and complete independently?

	1: Tasks are too large or complex that I cannot just pick one up when I have some spare time	2	3: A few tasks I can do when I have a slow time	4	5: I can pick almost any task and complete it independently in a short amount of time	N/A	Don't know
Task size	○	○	○	○	○	○	○

Description/Example: Tasks can be small and independent where one person can go choose any task and complete it. The alternative are large tasks that require a long time to complete and potentially need coordination with other developers.

Conclusions

- Developed a survey instrument
- Ran a pilot study, data collection
- Exploratory factor analysis
- Followed up through interviews
- Applied feedback to instrument

- Next steps:
  - Scale instrument validation
  - Evaluate influence of culture on adoption

UNIVERSITY OF
Nebraska
Omaha