Tool adoption in the Debian Project

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Uni Limerick · LERO · Debian

30 Jul 2009 @ DebConf9
Talk outline

1. The Delphi method
2. Research approach
3. Results: 24 influences
4. Gems
5. The Delphi method and FLOSS
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1. The Delphi method
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You want to be a millionaire?
But you don't know the answer, eh?
FAIL!
Three jokers
Three jokers

Phone a friend
Three jokers

Ask the audience
Three jokers

50–50
Three jokers

Phone a friend
Ask the audience
50–50
Three jokers

Phone a friend
Ask the audience
50-50
Given enough diversity, several heads are better than one at making subjective conjectures.
The wisdom of crowds

Given **enough diversity**, several heads are better than one at making subjective conjectures.
The Delphi method

Question?

Initial Round
1a 2a 3a 4a 5a

Answers need to be:
- anonymous
- only visible for the moderator

Reformulation of answers in order to narrow the points of view

Reformulation is done by anonymous moderator

Round X
1x 2x 3x

Some experts:
- evaluate if they agree to the reformulation
- narrow their point of view

Reformulation is done by the same anonymous moderator

Synthesis

Martin Erpicum, CC 2.0 by-sa
http://www.flickr.com/photos/78846417@N00/2513262775/
Moderated group communication technique
Moderated group communication technique

Anonymous
Moderated group communication technique

Anonymous

Controlled feedback
Moderated group communication technique

Anonymous
Controlled feedback
Group response
Talk outline

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Objective

- identify the salient influences to package maintainer’s adoption decisions;
- extensively document and explain the Delphi process to facilitate its future use in a FLOSS context;
- make all data available under a Free licence.
Exploratory: gather breadth
Qualitative: inherently biased
Sociology:
many parts of the results are not mine
The panel
Selecting for diversity
Selecting for diversity

- Uniform vs. diverse package catalog
Selecting for diversity

- Uniform vs. diverse package catalog
- Uniform vs. diverse tool sets
Selecting for diversity

- Uniform vs. diverse package catalog
- Uniform vs. diverse tool sets
- Team player vs. solo worker
Selecting for diversity

- Uniform vs. diverse package catalog
- Uniform vs. diverse tool sets
- Team player vs. solo worker
- Process improvement vs. getting things done
Research approach

1. Ask 162 visible, innovative people for nominations (snowball sampling)
2. Ask 43 nominees (>2 times) for self-categorisation
3. Pick 16 according to a 4D feature matrix (stratified purposeful sampling)
4. Pick 3 people from the centre
5. Engage in the Delphi discussion
Ask 162 visible, innovative people for nominations (snowball sampling)
Research approach

- Ask 162 visible, innovative people for nominations (snowball sampling)
- Ask 43 nominees (> 2 times) for self-categorisation
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First Delphi round: exploration

While deciding whether or not to adopt a tool or technique, people normally weigh many options, and take various points into consideration which influence their decision. Please describe at least six such influences you have witnessed in the Debian project, and which you expect to witness again on future occasions.
Second Delphi round: discussion

Go through and read this collection, and comment whenever you disagree or would like to set something straight. If you leave a statement uncommented, I will assume that you generally agree.
Third Delphi round: concentration

Select the three strongest influences (positive or negative) you have experienced in the context of your packaging work in the Debian project, and share details about how these influences have previously manifested themselves and are expected to do so again in your immediate environments.
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24 influences

- Return-on-investment
- "Peercolation"
- Maturity
- Trialability
- Genericity
- Quality assurance
- Transparency
- Uniformity
- Quality docs
- Scaled use
- Consensus
- Cost-benefit
- Marketing
- Compatibility
- Elegance
- Examples vs. docs
- Sedimentation
- Resistance
- Modularity
- Sustainability
- Network effects
- Chunking
- Standards
- First impression
Applicability of classical diffusion studies to FLOSS

Four major dichotomies determine the nature of diffusion:
Applicability of classical diffusion studies to FLOSS

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- **peer-to-peer** vs. top-down communication
- **voluntary** vs. authoritarian
- low dependencies vs. **high dependencies**
- individual vs. **community/organisation**
Rogers’ innovation-decision stages [2003]

Individual adoption is a process:

1. Knowledge: discovering an innovation
2. Persuasion: forming an opinion
3. Decision: making a decision for or against
4. Implementation: putting it to use, re-inventing
5. Confirmation*: confirming one’s choice
Rogers’ innovation-decision stages [2003]

Individual adoption is a process:

- **Knowledge**: discovering an innovation
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Kwon et al.'s IS implementation stages [1987]

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- **Initiation**: pressure to change
- **Adoption**: resource allocation
- **Adaptation**: innovation and organisation converge

- **Acceptance**: understanding grows
- **Use, performance, satisfaction**: benefits become noticeable
- **Incorporation**: integration into regular activities
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Need or innovation: what comes first?

Individuals: needs tend to be generated from innovation

Organisations: innovation is mostly sought to match needs

FLOSS: individual innovation preceeds organisational need
Need or innovation: what comes first?

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1. Individual knowledge

Cognitive knowledge, ends with first impression

- **Marketing**: creating awareness, meeting needs
- **Sedimentation**: the nature of spread of ideas
- **Chunking**: revolution & evolution: piece-wise adoption
1. Individual knowledge

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2. Individual persuasion

Affective knowledge, positive and negative
Forward looking

- First impression: the foot in the door
- “Peercolation”: people networks and respect
- Consensus: the right amount of discussion
- Resistance: benefits of and dealing with resistance
- Sustainability: confidence in the decision
2. Individual persuasion

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- **Trialability**: ease of trying out a tool
- Quality docs: maintenance, verbosity, target audience
- Examples vs. docs: role of examples and templates
- Cost-benefit: investing time vs. getting things done
- Compatibility: amount of effort for change
3. Individual decision

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The Unix principles:

- **Transparency**: automation and loss of control
- **Modularity**: granular vs. monolithic solutions
- **Genericity**: re-use of a tool for other tasks

(same as organisational adaptation)
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5. Organisational initiation

- **Uniformity**: benefits of and needs for uniformity
6. Organisational adoption

- **Network effects**: dampening and enabling effects of teams
7. Organisational adaptation

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(same as individual implementation)
8. Organisational acceptance

- **Scaled use**: various degrees of use and gradual migrations
- **Maturity**: usability and stability without tracking development
8. Organisational acceptance

- **Scaled use**: various degrees of use and gradual migrations
- **Maturity**: usability and stability without tracking development
9. Use & confirmation

- **Return-on-investment**: value of future benefits
10. Incorporation

- **Standards**: creation and effects of standards
- **Quality assurance**: automated tests
10. Incorporation

- **Standards**: creation and effects of standards
- **Quality assurance**: automated tests
## Innovation stages

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### Initiation
- **Uniformity**
  - Network effects

### Adoption
- **Adoption**
  - Transparency
  - Modularity
  - Genericity

### Adaptation
- **Acceptance**
  - Sealed use
  - Maturity

### Acceptance
- **Use Performance Satisfaction**
  - Return on investment

### Incorporation
- **Standards**
- **Quality assurance**
The 24 influences

Return-on-investment: value of future benefits
"Peercolation": people networks and flow of information
Maturity: usability and stability without tracking development
Trialability: ease of trying out a tool/technique
Genericity: re-use of a tool/technique for other tasks
Quality assurance: automated tests
Transparency: automation and associated loss of control
Uniformity: benefits of and needs for uniformity
Quality documentation: maintenance, target audience, & verbosity
Scaled use: various degrees of use and gradual migrations
Consensus: just the right amount of discussion and consensus
Cost-benefit: investing time vs. getting things done
Marketing: increase awareness of a tool/technique
Compatibility: minimal effort for change
Elegance: personal preferences and irrationality
Examples vs. documentation: role of examples and templates
Sedimentation: the nature of spread of revolutionary ideas
Resistance: benefits of, and dealing with resistance
Modularity: granularity vs. monolithic solutions
Sustainability: confidence in the decision for a tool/technique
Network effects: dampening and enabling effects of teams
Chunking: revolutions and evolutions, and peace-wise adoption
Standards: creation and effects of standards
First impression: make sure the first impression is good
Talk outline

1. The Delphi method
2. Research approach
3. Results: 24 influences
4. Gems
5. The Delphi method and FLOSS
Automation and desire

*Automation must be motivated by the desire to do more, not to do less.*
Standardise interfaces, not processes

The trick is to standardise the right things. Getting the right VCS layout is important. It doesn't matter so much if I used svn-buildpackage to get there as long as it's right.
Credible recommendations

The most persuasive advocates are the ones who can clearly explain why a new tool or technique is better, who are perceived as having significant experience within the area affected by that tool or technique, and who seem to have done all of the research and experimentation that we'd all like to do but usually don't have time for.
Guilt and negativity

New tools add more onto an already overloaded queue and can produce feelings of guilt, and people usually react with a bit of hostility to things that make them feel guilty. I think this is a more likely explanation than suspicion of ulterior motives.
Let us assume that there is some fraction of GNU/Linux users and developers with a strong 

**distrust of corporations.** Those people will naturally tend to gravitate towards 
non-corporate distributions, of which by far the most competent and complete is Debian. 
As a result Debian can hardly avoid 

**accumulating some anti-corporate bias,** simply by the fact of its existence and position.
A variant case of social influence is the debian-mentors mailing list. “Do this, do that, or I will not sponsor your package” (with some explanations) shapes the choices of our next generation of developers.
Aesthetics is part of the efficiency. I'm more prone to be efficient and willing to modify something that pleases me than something horrible and broken.
Finger compatibility

The tool must not get in the way. People usually don't like to have to think about how their tools work. They must come naturally. If they don't, it means lower productivity.

Finger-compatibility with previous forms of similar tools is important: for example, Subversion (and to some extent also Bazaar) have benefited from trying to provide workflows and command names familiar to CVS users where possible.
Talk outline

1. The Delphi method
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Mailing list discussions suck

Image from WikiCommons
Controlled feedback
Delphi appears well-suited

cf. KernelTraffic
Delphi is a toolbox, not a prescribed method
Anonymity
Panel size
Sampling
Medium
Question design
Bias
Single issues
Single issues

not so well-suited for exploratory research
Questions?

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