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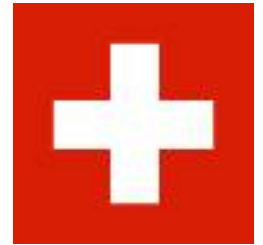
THE IRISH SOFTWARE  
ENGINEERING RESEARCH CENTRE

Ph.D. research: **Method diffusion in  
large open-source projects (Debian)**

Martin F. Krafft – 9 Feb 2007

Overview of research in progress

# About me: Martin F. Krafft



- born German living in Zürich/CH
- self-employed Linux/security consultant
- background: CS/Psychology/AI/Robotics
- long-time, well-known Debian developer
- author of The Debian System
- external/Industry Ph.D. student with Brian Fitzgerald, self-funded

## One slide on the Debian project

- oldest GNU/Linux distribution: 14 years
- among the largest OSS projects:  
1,300 developers + 2,500 contributors
- 18,000 packages, 11 architectures
- conservative: prefer solid solutions to quick 'n' dirty ones
- robust, secure, stable, Free
- 100% volunteers, flat, meritocratic



# Definitions

## Method diffusion in large open-source projects

- **method:** technique, tool, procedure
- **diffusion:** introducing with the goal to cause adoption
- **large project:** possessing a high inertia and complex self-dynamics

# Research basis

- Debian's methods evolved over time
- high interdependence of methods
- stagnating efficiency in day-to-day activity
- improved methods exist, but volunteers cannot be told to use them
- **under what circumstances would volunteers adopt new methods?**

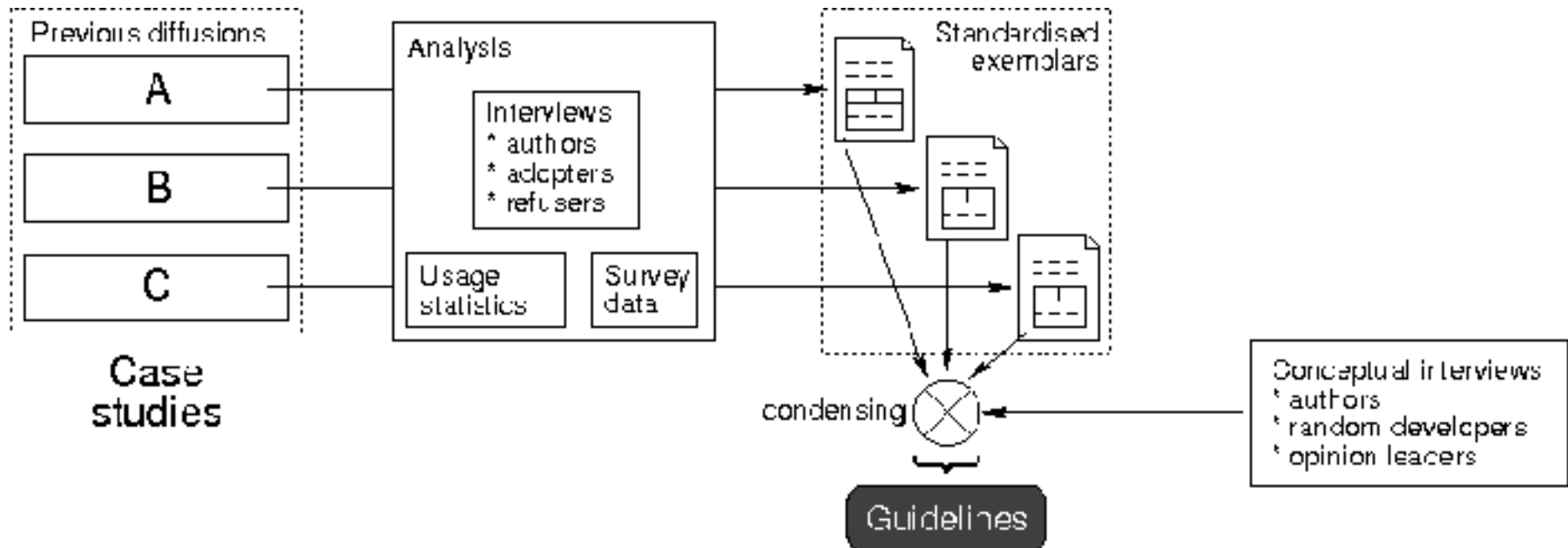
# Research approach

- two phases:
  - identification of attributes of successful diffusions, formalisation of guidelines (case studies, diffusion research)
  - application & verification of guidelines (participatory action research)

# Phase 1: guideline definition

- **case studies**
- analyse previous diffusions
- interviews (experience & conceptual)
- usage statistics (from repositories, mailing lists, installation reports)
- survey data

# Phase 1: guideline definition

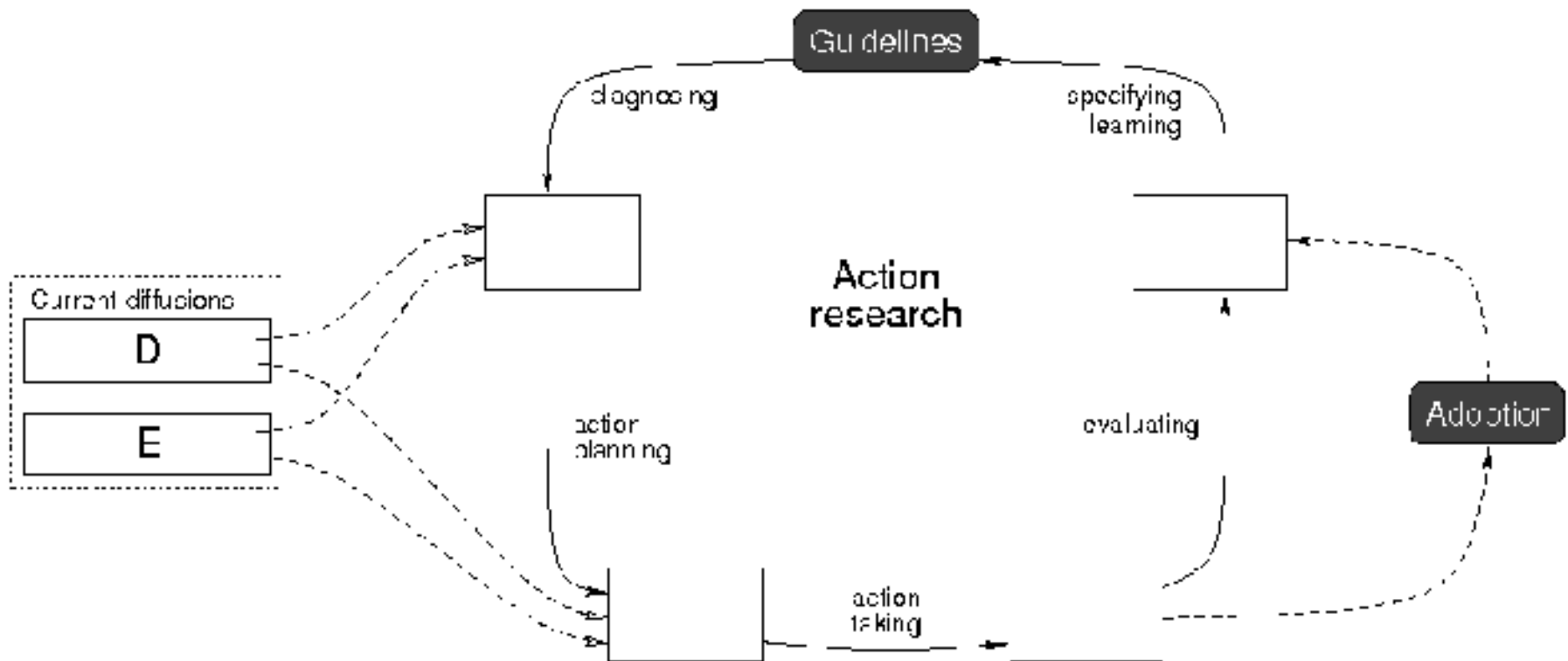




## Phase 2: implementation

- **participatory action research**
- explain successful/failing diffusions
- predict success of ongoing/planned diffusions
- engineer diffusions for success

# Phase 2: implementation



# Conceptual framework

- skeletal structuring of attributes to facilitate comparisons of diffusions
- existing frameworks from sociology and management science:
  - voluntary, independent adoption decisions by individuals
  - authoritarian, concerted diffusions
- OSS more complex: strong network externalities, ideology, voluntary/cabal



# Hypothesis

There exist characteristics of innovations and strategic considerations of their diffusions which **directly affect the rate of adoption** in volunteer projects

Knowledge of these characteristics enables **engineered diffusions to improve efficiency of cooperation**

# Implications on management

- treat employees as volunteers
- motivation from (perceived) autonomy

## Further information

- research webpage:  
<http://martin-krafft.net/phd/>
- Debian work:  
<http://people.debian.org/~madduck/>
- Debian book:  
<http://debiansystem.info/>
- <mailto:phd@martin-krafft.net>  
<mailto:martin.krafft@lero.ie>