

# **Why Hackers Do What They Do: Understanding Motivation and Effort in Free/Open Source Software Projects**

Karim R. Lakhani and Robert G. Wolf

Reviewed by K. Shabaga



# Purpose of this paper

- What drives Free/Open Source Software (F/OSS) developers to contribute their time and effort to the creation of free software products?

# Overview

- Background
  - Motivation
  - Benefits
- The survey
  - Methodology
  - Results
- Discussion

# Motivation

- Intrinsic
  - Enjoyment based
  - Community/obligation based
- Extrinsic

# Intrinsic Motivation

- “When intrinsically motivated, a person is moved to act for the fun or challenge entailed rather than because of external prods, pressures, or rewards”
- You do something because you want to, not because you have to.

# Intrinsic Motivation

- **Enjoyment based**
  - Having fun or enjoying oneself when taking part in an activity...
  - A task that is beyond the skill of an individual will provoke anxiety, and a task that is below the person's skill level will induce boredom.

# Intrinsic Motivation

- **Obligation/community based**
  - Acting on the basis of principle
  - Adherence to the norms of behaviour

# Extrinsic Motivation

- As long as the *benefits* exceed the costs, programmers might choose to participate in F/OSS projects.

# Extrinsic Motivation

- **Immediate Benefits**
  - Being paid to participate
  - User need for particular software - drive the specification/design
  - Direct use of the software

# Extrinsic Motivation

- **Delayed Benefits**
  - Career advancement
  - Improved programmer skills

## How was the study conducted?

- SourceForge.net (multi-developer)
  - Alpha, Beta, Production/Stable
    - 10% random sample
    - 550 projects
    - 1648 email addresses
  - Mature
    - 103 projects
    - 573 email addresses

As of 17 Jan 2004

Registered Projects:  
**93,863**

Registered Users:  
**993,609**

# Web-based Survey Results

- First survey (Alpha, Beta, Production/Stable)
  - 10-30 Oct. 2001
  - 526 responses / 1648 emails
  - 34.3% response rate
- Second survey (Mature)
  - 8-28 Apr. 2002
  - 173 responses / 573 emails
  - 30.0% response rate

# Survey Results: Demographics

- 97.5% male
- Average age: 30 years
- Average years programming: 12
- 45% from North America
- 38% from Western Europe

# Survey Results: Training

Formal university-level	51%
On-the-job	9%
Self taught	40%

# Survey Results: Occupation

Professional programmers	45%
System administrators	13%
Students	19.5%
Other	22.5%

# Survey Results: Effort

- Effort = number of hours per week
  - 14.3 hours/week on all projects
  - 7.5 hours/week on main project
- Paid contributors work more hours than volunteers.

# Survey Results: Motivation

- Intrinsic: Enjoyment-based: 44.9%
  - “Project code is intellectually stimulating to write”
- Extrinsic: 41.8%
  - Improving programming skills
- Intrinsic: Obligation/community-based: 33.1%
  - “source code should be open”

# Survey Results: Cluster Analysis

25%	Work need; paid; professional status
27%	Non-work need; intellectually stimulating; improves skill
29%	Intellectually stimulating; improves skill
19%	Code should be open; beat proprietary software; obligation from use

# Conclusions

- Work on F/OSS projects can be summarized as:
  - A creative exercise
  - Leading to useful output
  - Where the creativity is a lead driver of individual effort

# Conclusions

---

- Contributors are motivated by a combination of intrinsic and extrinsic factors with a personal sense of creativity being an important source of effort.

# Discussion

---

- Who has participated in F/OSS?
- What was your motivation?
- Were the findings surprising to you?