The Ubuntu hackers' perception and use of computers

Fieldwork Proposal. Andreas Lloyd. January 2006.

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Introduction

Within the past 30 years, the computer has become a metonymy for technology – such an integral part of basically any new technological development produced that most users take the possibilities offered by the computer for granted, yet they rarely understand how the computer works. Working as a university computer supporter for several years, I have often found myself confronted with the bafflement or frustration that most computer users experience with their machines, and how they often mindlessly anthropomorphisize the responses of the computer (cf. Turkle 1984, 1990, Pfaffenberger 1988, Nass & Moon 2000, Jackson 2002, Miller 2002).

These experiences have awakened my curiosity regarding the expert computer users – the programmers and engineers who are caught up with an intense need to continuously understand and master the complexity of the computer (Turkle 1984: 207-225). These enthusiasts often refer to themselves as *hackers*,[1] though not in the sense often used by the press to describe malicious meddlers who break into computer systems. Rather, a hacker, in the original computer jargon, is "A person who enjoys exploring the details of programmable systems and how to stretch their capabilities, as opposed to most users, who prefer to learn only the minimum necessary."

But as Steven Levy states it is central to the *hacker ethic* to share knowledge to allow all interested individuals to learn as much as possible (Levy 1984: 39-49). With the advent of the Internet, this has been made possible on a large scale, and it has made it possible for hackers with similar interests to coordinate communal software projects and volunteer labour to write and share the computer code in order to gradually and organically help improve the software in an often meritocratic fashion (cf. O'Mahoney 2002, Weber 2004, Coleman 2005). This *Free and Open Source Software* (F/OSS) mode of development has a native appeal to hackers seeking to share their mastery of the computer due to its openly accessible, reciprocal and semi-egalitarian nature. It is these hackers' relationships with and through the computer as part of the social workings of an F/OSS software project called Ubuntu that I wish to examine.

Therefore, the aim of this study is two-fold: Firstly, to examine how the Ubuntu hackers use and relate to the computer in their work and everyday life as a means of intellectual pursuit; secondly to examine how they maintain social relations and coordinate their work and what part the computer, especially programming languages and technical jargon, play in this exchange.

1 Throughout this proposal, I use emic terms from the highly self-reflexive hacker community. All of these terms will be italicised in the text and are defined in the glossary in Appendix A. Many of these terms, including this quote was taken from the Jargon File – an online dictionary of hacker terms and jargon that has been compiled by various hackers since the early 80's. It is currently under the editorship of prolific hacker Eric S. Raymond. The Jargon File has been published by MIT Press under the name "The New Hacker's Dictionary" (1996).

Research questions

0) How do the participants define the Ubuntu online community?

0a) For what reasons – intellectually, socially and in terms of proficiency – do hackers join the Ubuntu community?

0b) What goals, commitments and ideas are shared in the Ubuntu community?

1) In what ways do the hackers relate to and perceive the computer itself?

1a) How do hackers use programming languages as a tool and as an element of interaction and reciprocity with the computer?

1b) What criteria and elements do hackers value in designing and programming a computer program?

2) How do hackers coordinate their individual efforts in an Open Source software project such as Ubuntu?

2a) What part do programming languages, specialised computer jargon and metaphors play in the social relations between hackers?

2b) How do hackers come to share ethics, sociality and reciprocity through the computer?

Significance of the study

The study of the interplay between human and computer has grown explosively in the past 30 years. But due to the clear disjuncture between ordinary and expert users' experience of a computer, most of the anthropological or sociological attention has been focused on ordinary users (see references above), while psychologists and computer scientists have focused on the expert users (Weinberg 1971, Turkle 1984, Brooks 1995, Orr 1996, Raymond 1997, 1998, Graham 2004, Fogel 2005, Lethbridge, Sim & Singer 2005). Only in the past few years have the first comprehensive anthropological studies begun to appear, inspired by the emergence of the Open Source movement in the 1990's (Coleman 2004, 2005, Kelty 2002, 2004, 2005, Leach 2005, Risan 2005). They focus on the ethical, ideological and motivational elements of the social process of Open Source development, and I will seek to take these recent studies as the basis for my fieldwork. But I will seek to focus on the hackers' perception, language and social use of computers in order to gain a better analytical perspective on the computer's role as a tool, and on the role of technical jargon and programming code as means of social exchange. This may offer new perspectives on exactly how this disjuncture is maintained, and how the hackers' encoding of values and ideas into the computing technology may be shaping the ordinary users' experience of the computer.

Setting / background

The focus of my fieldwork is the software development community surrounding the Ubuntu *Linux distribution* (www.ubuntulinux.org), first released in October 2004. The project is a young, yet already prolific attempt to make a free, userfriendly computer operating system based on a regular *release schedule* every six months in order to keep up with the rapid developments of the F/OSS community. Like many other F/OSS projects, Ubuntu is conceived and led by a single person – in this case the South-African IT entrepreneur and dot.com millionaire Mark Shuttleworth. But unlike most other F/OSS projects, it is sponsored by Shuttleworth's company, Canonical, by employing 20 core developers from the F/OSS projects on which Ubuntu is based so that they can work full-time on Ubuntu. Even so, Ubuntu is still centred on the open and public community effort made by more than 150 volunteer developers (almost solely male) and more than 60.000 active registered users worldwide (though mainly in Europe and North America).[2]

Thus, there is no single place for me to do fieldwork. It is through the Internet – and its new means of communication and knowledge exchange such as *blogs*, *wikis*, *bug trackers, revision control systems, mailing lists*, *newsgroups* and *IRC channels* that these hackers communicate, and it would be through these virtual media that I will seek to gather most of my data. I will combine this online fieldwork with in-person fieldwork at developer conferences, which may take on even greater social importance as the creation of personal connections which the virtual serve to augment. Also, I will seek to visit the developers and spend a few days with each of them, participating in their daily work routines and studying their actual computer use.

This kind of combined online and multi-sited fieldwork has already been successfully performed by Gabriella Coleman (2005), Mette Terp Høybye (2002) and several others (cf. Hine 2005) and I will seek to build on their experiences with online fieldwork. There are many misgivings surrounding online fieldwork, for example that it is anonymizing in is textuality, that it does not allow for physical rapport[3] between informant and ethnographer. But these are basic circumstances which affect everybody who interacts through the Internet. It is exactly studies of *how* people who have little day-to-day contact other than through the Internet socialize and manage to create a sort of virtual rapport that I will use as a basis for my fieldwork. Even so, it is essential that I do not let my fieldwork be dichotomized between the online persona and the in-person informants I meet, as many online informants do not attribute much significance to this distinction themselves (cf.

2 Estimates are based on the number of registered developers and the number of members of the online forums. The developers claim that millions of users are using Ubuntu (Ubuntu Press Announcement 28th of November 2005).

3 Having *rapport* with someone is to be at ease with one another and where communication is occurring easily. The term comes from Neuro-Linguistic Programming (cf. Vadum Dahl 1993).

Markham 1998). I hope to use this awareness to my advantage by using both my unaccostumedness with the online communication and the inherent distance of the multi-sited fieldwork to leverage my attention towards the unusual and thus continuously exotize the field.

Design and methods

I will follow the various distinct phases of a single development cycle of the software diachronically in order to examine how the hackers' social interaction, commitment and computer use may change in the course of such a 6-month process (cf. my proposed time plan in Appendix B). I will seek to position myself within the project both as an apprentice hacker, somewhat proficient with machine, and as an amazed and uninitiated end-user. By alternating between these opposing positions, I hope to leverage amazement and understanding in such a way to gain wider perspective on how hackers perceive, speak of and use computers. From this position, I will use a wide range of anthropological methods to seek out answers to the research questions offered above.

Firstly, in order to demarcate the Ubuntu community as a field, I will seek to use a quantitative survey to gain an overview and an idea of the basic statistics of the Ubuntu community, including how many developers are involved – and for how long and how – the level of education, age, profession, gender, location and ethnicity (Q.0). I will seek to complement the survey data with narrative interviews on how and why the members came to join the Ubuntu community (Q.0a). Furthermore, it would be essential to study official project documents such as the *Code of Conduct*, *Developer Guidelines* and the rhetoric of the Ubuntu website so as to find the stated common goals and ideas of the project (Q.0b).

Secondly, in order to study how hackers discuss and socialize through the computer (Q.2-2b), I will use participant observation as my main method of data collection in the online community, through means of communication are expressed textually which, to most hackers, offer a familiar and secure domain where they interact empathically and confidently on a day-to-day basis (cf. Høybye 2002, Coleman 2005). Through participation in the online day-to-day exchange, and at the few in-person community conferences, I hope to gain a basic frame of reference on how hackers present and discuss technical and social issues relating to the computer.

Thirdly, I will seek to combine this kind of general participant observation with in-person participant observation and specific interviews at conferences and in their own working environment by the computer in order to examine the way the individual hacker uses and perceives his computer (Q.1-1b). I will seek to use “Think-aloud protocols” to let the informant work as usual, while describing his actions at the computer in detail one by one; as well as “Shadowing” an

informant through his work day to gain an idea of his work routines in conjunction with informant-written work diaries (cf. Lethbridge et al. 2005). In this context, I will also try to develop what Markussen calls the "humanly mediated computer interview": An attempt to "interview the computer through its owner" by exploring the intangible, abstract digital space of metaphorical logic, file hierarchy, social contacts and links contained within the computer, with the hacker himself as guide, explaining the reasons why he has organized his data in such a manner – not unlike the way in which Bourdieu examined how the Kabyles furnished their houses (cf. Markussen 2002, Bourdieu 1977). Finally, I will attempt to study the artifacts – code, computers, documents – themselves and the way that the hackers use them symbolically, spatially and aesthetically to see how their value and presence as objects may affect the way they are perceived.

Analytical elements of the study

I have constructed my analytical framework so as to let the individual elements overlap to some degree, I hope that that will lessen any tendency towards seeking predefined answers and instead bring new issues and questions into play based on the current body of work on the subject.

Firstly, in order to understand the relationships that work to bind the Ubuntu community together (Q.0-0b, Q.2b), I will use what Marshall Sahlins calls *generalized reciprocity* where "the return favour is not determined by time, quantity or quality: the expectation of reciprocity is indefinite" as a basis for comparison with the hackers' exchange of code and ideas (Sahlins 1972). Sahlins' definition depends on social proximity, but as Christopher Kelty argues, with digital technology and its inherent possibility of endless copies at zero-cost, the F/OSS community has succeeded to scale this system of exchange from a local level to a global one through licences incorporated into the software itself that morally and legally obligate all persons using the software to do so on equal and thus generalized terms (Kelty 2002). Developing this, James Leach states that when hackers collaborate on source code, each contributor's work is individually owned and annotated with the coder's name. Yet the code is only valuable as a combined whole *multiply owned* by all contributors (Leach 2005). This idea of multiple ownership may prove central to understanding not only the individual hackers' working responsibilities and interests but also their social status within the project.

Secondly, in order to examine the role of the code itself and the related jargon within the Ubuntu project (Q.1a, Q.2a), it will be necessary to understand the way the software is developed. As Kelty points out, the F/OSS development model does not *create* software, it only perfects it. Creating software still requires some sustained, concerted effort to be the basis for a community effort (Kelty

2002). Thus, Lars Risan argues that the exchanged code is sacramental in Gregory Bateson's understanding of the term: The annotated code is a sacrament of the coder's skill and charisma, but not just a symbol, it *is* the hacker's charisma – visible in their code. Therefore, having written the core of a popular program is sure sign of status in the F/OSS community (Risan 2005).

As many computer scientists (Ershov 1972, Brooks 1995, Knuth 1992, Graham 2004) and even literary critics (Black 2002) have argued, programming and mastering the computer can be an aesthetically pleasing art form in its own right. Patrice Riemens sums it up well: “the hacker ethic runs strikingly parallel to the formula "l'art pour l'art."” (Riemens 2002). This art – the sophisticated, aesthetic of the code itself, the knowledge inherent in its writing and the overall usefulness of both – is more important than any political, economical or ethical motives that any individual hacker may attribute to it (cf. Coleman 2004). I expect that these ideas of aesthetics and charisma inherent within the code may offer to answer questions regarding the collaborative writing and critique of code (Q.1b & Q.2) and may even offer perspectives on how this aestheticism is prioritized in relation to other issues.

Thirdly, I will use Claude Lévi-Strauss' term *Bricolage* (Lévi-Strauss 1994:28) to understand the egalitarian piecing-together of ethics, goals, code and ideas within the Ubuntu project (Q.0-0b, Q.2b) which resembles the same manner of decentralised intellectual expression through heterogeneous and limited means as originally suggested by Lévi-Strauss in his application of the term to mythical thought. In this frame, the hacker will take the role of the *bricoleur,* as suggested by both Turkle (1990) and Orr (1996): Exploring, connecting and repairing bits and pieces to bring them to new usefulness – both by himself and in the community. These bits and pieces are often scientific facts or technological objects consisting of untold layers of set ideas and work – what Bruno Latour calls *black boxes* (Latour 1987: 131). I expect that this concept can help open new paths of investigation, as the Ubuntu hackers open some of these black boxes when hacking technologies and abstract concepts into new, frayed forms and uses; while closing others by accepting the basic form of the computer, with its inherent ideas and presumptions, in order to use it effectively as a tool (Q.1-1a).

Fourthly, I will to use Heidegger's terms *ready-to-hand* and *unready-to-hand* as used in relation to technology by both Ingold (1997, 2000) and Winograd & Flores (1990) to examine the computer as a tool (Q.1-1a). I expect that hackers, constantly seeking mastery over the computer and exploring its limits, have a very conscious perception of the computer as ready-to-hand due to the continuous risk of the breakdown and forced reflection of the computer's sudden unreadiness-to-hand.

Practical considerations

As English is the de facto language of Ubuntu – my main challenge will be to understand the technical jargon. Based on the advice of Coleman I will take a programming class in order to further develop my own frame of reference to computer and program architecture (based on my knowledge as a computer supporter) (Coleman, personal communication 2005). I will seek develop this frame of reference through a reflexive distance and analytical focus in order to study the basics of the "native language" while building a safe minimum with which to base my enquiries .

Also, because of the multi-sited nature of my fieldwork, my travel expenses will be greater than the average fieldwork – in spite of the fact that I will have less time abroad "in the field." I hope to be able to coordinate meetings with informants so as to minimize expenditures, but even so, I will still need to raise more funds from various grants (cf. my proposed budget in appendix C).

Ethical considerations

Since almost all of the discussion, mail exchanges and meetings concerning Ubuntu are open and publicly available to everybody, it is in fact possible to follow and read all of this data completely anonymously. Yet, as Høybye argues convincingly, as anthropologists we have an ethical obligation to make our presence, and thus the fact that we are recording data, known (Høybye 2002). Further, as Coleman shows, hackers often take an active and reflective interest in studies of their cultural and social doings, even working them into their own self-representation (Coleman 2005). The community I will be studying consists of well educated, vocal individuals with their own strong ideas and identity at stake, and as Singer & Vinson suggests, it will be necessary to position myself clearly in relation to the expectations of my informants (Singer & Vinson 2002). Yet, as the soon as I introduce my project to the community, I will have initiated my fieldwork, as it is only by actively participating in the online community that I can enter the field. Along with an introduction to my project, I plan to provide a link to my weblog [www.alligevel.blogspot.com] (a common way of introducing oneself in on-line circles). I expect that my informants' general and pragmatic interest in their own community will extend to my project, also.

Appendix A – Glossary

Blog

Blog is short for *weblog*, a type of frequently updated website consisting of dated entries arranged in reverse chronological order so the most recent post appears first. Typically, weblogs are published by individuals and their style is personal and informal. Many Ubuntu developers have their own blogs, discussing a wide range of topics, but especially software development.

Bug Tracker

A system for receiving and filing bugs (programming errors, design flaws etc.) reported against a software project, and tracking those bugs until they are fixed. These reports can be commented by other developers, and the status of the bugs can be updated. Ubuntu uses a central Bug Tracking System called Malone.

Code of Conduct and Developer Guidelines

These are typical documents or social contracts within Open Source development. A hacker interested in working with the project has to verify his identity and accept these basic rules in order to participate in the project as proper members of the community.

Free and Open Source Software (F/OSS)

The term F/OSS is often used to bridge the ideological divide between the free software and open source software movements. The term Free Software preceded the term open source software, and was first used by the hacker Richard Stallman and his Free Software Foundation to define software that has openly available source code and is freely modifiable. The term Open Source was introduced by members of the free software community who were concerned that 'free' in the English language is ambiguous and can mean both gratis and libre (Stallman countered that Free Software is free as in freedom, not as in free beer). The Ubuntu website states that the project supports both definitions.

Hacker Ethic

A term created by author Steven Levy to describe a collection of ethical notions that hackers seem to have in common: Boundless technical curiosity, desire to take apart and master new technology and share your knowledge, belief that it is possible to create works of art and beauty on a computer (and that these can change your life for the better) and a meritocratic notion that hackers should be judged only on the quality of their hacking, rather than any other criteria such as age, academic degree or position (Levy 1984). Despite its etic origin, it has since become part of hacker culture to some degree.

IRC Channel

Internet Relay Chat is a protocol that allows for chat messages over the internet. An IRC channel is chat “room” of sorts, where, after joining the channel, your messages are broadcast to everyone listening to that channel. The Ubuntu project has 25 official development IRC channels (all in English) and 29 channels for various localized languages. These are realtime community discussion and meeting fora.

Linux Distribution

A Linux distribution is a computer operating system comprising various F/OSS components, such as the Linux kernel, the Open Office suite and the Mozilla Firefox browser – to name but a few of the most well-known. All of these have been developed in various F/OSS projects, but are put together into a working operating system by the developers of the distribution. Ubuntu is based on an older Linux distribution called Debian, and still have strong ties to that development community.

Mailing List

A mailing list is a discussion group that occurs via mass e-mail distributions and to which individuals can subscribe to receive all the e-mails sent to that list. The Ubuntu project has 62 mailing lists, around half of which are localized language lists and the other half are development lists.

Newsgroup
An Internet discussion group that is available either through a newsreader program or through a web browser interface. There are more than 20 Ubuntu web fora at [http://www.ubuntuforums.org] with more than 60.000 registered users.

Release Schedule
All computer programs are released with version numbering to make it easy to see how the software has changed from version to version. The Ubuntu project has a release schedule for the release of a new version of Ubuntu every six months, in April and October. Maintaining such a tight release schedule is usually not a given thing in F/OSS production.

Revision Control System
Revision control (also known as version control) is the management of multiple revisions of the same unit of information, especially source code, to track changes made to this information. It also allows commenting and reverting to previous versions of the code. The Ubuntu project uses a revision control system named Bazaar.

Wiki
A wiki is a type of website that allows users to add and edit content, combined with a system that records each individual change that occurs over time, so that at any time, a page can be reverted to any of its previous states. The Ubuntu project use its wiki [https://wiki.ubuntu.com] extensively – including personal profiles, goal specifications, documentation, conference and meeting info.

Appendix B – Time plan for preparation and fieldwork. January to October 2006

Stage 1 January-March Weeks 3-13	**Preparation** – Programming class at the IT University of Copenhagen. Further research and gaining of expertise regarding Linux programming and archicture. – Final clearance from core developers for the fieldwork. – Fundraising among relevant foundations and IT companies with an active interest in F/OSS such as IBM, Hewlett Packard and Sun. – Following developments and participating in debates in the Ubuntu community as an ordinary user, reading blogs, mailing lists and wikis (this continues throughout the fieldwork).
Stage 2 April Weeks 14-16	**Entering the field** – New version of Ubuntu, code-named *Dapper Drake*, is released on April 20th. A new development cycle begins. – Introducing the community to the project. Beginning active and official fieldwork within the community with participation in on-line meetings on IRC, reading bug reports and version updates (this continues throughout the fieldwork). – Sending out quantitative survey to Ubuntu developers to gain overview of the basic statistics of the community and demarcate the field. – Detailed investigation of Ubuntu documents and rhetoric.
Stage 3 April-May Weeks 17-21	**Fieldwork at conference** – Participation in expected two-week conference concerning new version of Ubuntu (location still undecided). – Meeting the developers in-person. Getting familiar with their mode of work and the way they physically relate to the computers as artifacts. – Initial narrative interviews on informants' relationships to the Ubuntu community. – Visits with local Ubuntu developers after the conference. Participant observation and humanly mediated computer interviews at the informants' computer.
Stage 4 May-June Weeks 22-26	**Continued online fieldwork and analysis** – Analysis of quantitative data from survey in conjunction with data gathered at conference. – Continued online fieldwork, contacting the developers to arrange visits with them where they work.
Stage 5 July- August Weeks 27-33	**Conferences and in-person fieldwork in North America** – Participation at the big F/OSS conferences OSCON and Linux Symposium in North America, combined with visits to local Ubuntu developers. More interviews and participant observation of computer use.
Stage 6 August-October Weeks 34-40	**In-person fieldwork in Europe** – Visits to Ubuntu developers in Europe. Time for alternative paths or unforeseen changes in analytical focus.
Stage 7 October Week 41	**Conclusion of fieldwork** – New version of Ubuntu is released. Release party marks the end of the fieldwork.

Appendix C – Budget for fieldwork. April to October 2006

Length of fieldwork: 6 months.

Expenses	***DKK***
6 months living costs in Copenhagen	
Rent (6*2025)	12.150
Food, local insurance and other*	13.550
Unexpected expenses	2.500
Travel expenses	
Return flight ticket to Ubuntu conference site (yet to be decided)**	1.200 - 6.200
Return flight ticket to San Francisco or Seattle	4.925
Local transportation in North America	8.500
Flight tickets and local transportation expenses in Europe	8.500
Field expenses	
Gifts for hosts	2.500
Stays at hostels	5.800
Conference fees (student discount included)	800
Travel insurance	2.000
Equipment costs	
Laptop, digital camera, digital recorder, etc.	0***
Total expenses	62.425 – 67.425

Income	***DKK***
Federal Study Support (SU) (6 Months at 4161 dkk)	24.966
Stipend from Institute of Anthropology	14.000
Total income	38.966

Deficit	***DKK***
Total	23.459 – 28.459

Dette underskud søges dækket af tilskud fra legater og fonde.

* Dette inkluderer omkostninger til mad i felten.

** Disse rejseomkostninger er afhængig af, hvor konferencen bliver afholdt. Hidtil er de tre første konferencer blevet afholdt hhv. i Barcelona (Spanien), Sydney (Australien) og Montreal (Canada).

*** Jeg har ingen omkostninger til udstyr, da jeg allerede har investeret i dette.

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