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CONSTRUCTING A COMMUNITY
Myths and Realities of the Open Development Model

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Abstract

The open development model of software production has been characterized as the future model of knowledge production and distributed work. "Open development model" refers to publicly available source code ensured by an open source license, and the extensive and varied distributed participation of volunteers enabled by the Internet. Contemporary spokesmen of open source communities and academics view open source development as a new form of volunteer work activity characterized by "hacker ethic" and "bazaar governance". The development of the Linux operating system is perhaps the best know example of such an open source project. It started as an effort by a user-developer and grew quickly into a large project with hundreds of user-developer as contributors. However, in "hybrids", in which firms participate in open source projects oriented towards end-users, it seems that most users do not write code. The OpenOffice.org project, initiated by Sun Microsystems, in this study represents such a project. In addition, the Finnish public sector ICT decision-making concerning open source use is studied. The purpose is to explore the assumptions, theories and myths related to the open development model by analysing the discursive construction of the OpenOffice.org community: its developers, users and management.

The qualitative study aims at shedding light on the dynamics and challenges of community construction and maintenance, and related power relations in hybrid open source, by asking two main research questions: How is the structure and membership constellation of the community, specifically the relation between developers and users linguistically constructed in hybrid open development? What characterizes Internet-mediated "virtual" communities and how can they be defined? How do they differ from hierarchical forms of knowledge production on one hand and from traditional volunteer communities on the other?

The study utilizes sociological, psychological and anthropological concepts of "community" for understanding the connection between the "real" and the "imaginary" in so-called "virtual" open source communities. Intermediary methodological and analytical concepts are borrowed from discourse and

rhetorical theories. A discursive-rhetorical approach is offered as a methodological toolkit for studying texts and writing in Internet communities.

The empirical chapters approach the problem of "community" and its membership from four complementary points of views. The data comprises mailing list discussion, personal interviews, web page writings, email exchanges, field notes and other historical documents. The four viewpoints are: 1) the community as conceived by volunteers 2) the individual contributor's attachment to the project 3) public sector organizations as users of open source 4) the community as articulated by the Community Manager.

I arrive at four conclusions concerning my empirical studies (1–4) and two general conclusions (5–6). 1) Sun Microsystems and OpenOffice.org Groupware volunteers failed in developing necessary and sufficient open code and open dialogue to ensure collaboration thus splitting the "Groupware community" into volunteers "we" and the firm "them". 2) Instead of separating intrinsic and extrinsic motivations, I find that volunteers' unique patterns of motivations are tied to changing objects and personal histories prior and during participation in the OpenOffice.org Lingucomponent project. Rather than seeing volunteers as a unified community, they can be better understood as "independent entrepreneurs" in search of a "collaborative community". The boundaries between work and hobby are blurred and shifting, thus questioning the usefulness of the concept of "volunteer". 3) The public sector ICT discourse portrays a dilemma and tension between the freedom to choose, use and develop one's desktop in the spirit of open source on one hand and the striving for better desktop control and maintenance by IT staff and user advocates, on the other. The link between the global OpenOffice.org community and the local end-user practices are weak and mediated by the problematic IT staff-(end)user relationship. 4) Authoring community can be seen as a new hybrid open source community-type of managerial practice. The ambiguous concept of community is a powerful strategic tool for orienting towards multiple real and imaginary audiences as evidenced in the global membership rhetoric. 5) The changing and contradictory discourses of this study show a change in the conceptual system and developer-user relationship of the open development model. This change is characterized as a movement from hacker ethic and bazaar governance to more professionally and strategically regulated community. 6) Community is simultaneously real and imagined, and can be characterized as a "runaway community". Discursive-action can be seen as a specific type of online open source engagement. Hierarchies and structures are created through discursive acts.

Key words: open source software, open development model, community, motivation, discourse, rhetoric, developer, user, end-user

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Stephanie Freeman

Yhteisöä rakentamassa
Avoimen kehittämismallin myytit ja todellisuudet

Tiivistelmä (Abstract in Finnish)
Avoin kehittämismalli on tullut yleiseen tietoisuuteen Suomalaisen Linus Torvaldsin 1990-luvun alussa käynnistämän Linux-käyttöjärjestelmän kehittämisprojektin kautta. Avoin kehittämismalli viittaakin Internetin välityksellä tapahtuvaan, maantieteellisesti hajautuneeseen maailmanlaajuiseen ohjelmistojen kehittämistapaan, jossa kehittämisen kannalta olennainen lähdekoodi on julkisesti saatavilla. Malli perustuu kehittäjien ja virheentunnistajien vapaaehtoiseen osallistumiseen ja tehtävien valintaan. Kaupalliset toimijat kiinnostuivat 2000-luvun alussa avoimen kehittämismallin hyödyntämisestä, ja niin syntyi loppukäyttäjälle suunnattuja "hybridiprojekteja", joissa suurin osa käyttäjistä ei kuitenkaan kirjoita koodia. Ilmiö ei siis ole enää pelkästään hakkereiden harrastelemista vaan yhä useammin elimellinen osa yrityksen liiketoimintaa. Tähän uuteen hybridiin yhteisön ja yrityksen toimintamuotoon liittyy haasteita, joihin tämä poikkitieteellinen väitöstutkimus pyrkii vastaamaamaan.

Tutkimuksen kohteena on Sun Microsystems -yrityksen käynnistämä avoimen lähdekoodin toimisto-ohjelmistoa kehittävä projekti OpenOffice.org. Lisäksi tutkimuksessa tarkastellaan Suomen julkista sektoria avoimen lähdekoodin hyödyntäjänä. Väitöskirjan tarkoituksena on tutkia avointa kehittämismallia ja sen yhteisöjä koskevia olettamuksia, teorioita ja myyttejä analysoimalla OpenOffice.org kehittäjien motivaatiota, käyttäjiä ja johtamista.

Laadullinen tutkimus tuottaa tietoa hybridin avoimen lähdekoodin Internetyhteisön rakentamisesta ja ylläpidosta sekä näihin kietoutuvista valtasuhteista. Tutkimuksen pääkysymykset ovat seuraavat: 1) Miten avoimen kehittämismallin muutos vaikuttaa yhteisön rakenteisiin ja jäsenkunnan koostumukseen ja erityisesti kehittäjien, tekijöiden ja käyttäjien keskinäisiin suhteisiin? 2) Mikä on ominaista Internet-välitteiselle "virtuaaliyhteisölle" ja miten se voidaan määritellä ja miten se eroaa hierarkkisista tuotannon organisointimuodoista ja toisaalta perinteisistä yhteisöistä?

Tutkimuksen teoreettisessa viitekehyksessä hyödynnetään sosiologisen, antropologisen ja psykologisen tutkimuksen yhteisökäsityksiä, joiden avulla pyritään ymmärtämään todellisen ja kuvitteellisen yhteyttä virtuaaliyhteisöissä. Metodologisia ja analyyttisiä käsitteitä ammennetaan diskurssianalyysin ja

retorisen analyysin teorioista. Samalla kehitetään diskursiivis-retorinen metodologinen välineistö tekstien ja kirjoittamisen tutkimiseen Internet-yhteisöissä.

Empiirisissä luvuissa yhteisöä koskevaa puhetta ja yhteisön määrittelyä lähestytään neljästä toisiaan täydentävästä näkökulmasta:1) yhteisö vapaaehtoisten määrittelemänä, 2) vapaaehtoisten kiinnittyminen yhteisöön, 3) Suomen julkinen sektori avoimen lähdekoodin hyödyntäjänä, 4) yhteisö yhteisöjohtajan määrittelemänä. Aineisto koostuu sähköpostituslistojen keskusteluista, henkilökohtaisista puhelinhaastatteluista, web-sivujen kirjoituksista, blogeista, tutkimushenkilöiden kanssa käydystä sähköpostikirjeenvaihdosta, kenttämuistiinpanoista sekä historiallisista dokumenteista.

Empiiristen analyysien pohjalta muotoillaan neljä lukukohtaista johtopäätöstä (1–4) ja kaksi yleistä johtopäätöstä (5–6). 1) Yrityksen ja vapaaehtoisten yhteistyö OpenOffice.org Groupware- projektissa epäonnistui. Osapuolet eivät kyenneet muodostamaan riittävää dialogia. Tämän sekä yrityksen päätöksenteon avoimuuden kyseenalaistamisen seurauksena Groupware-yhteisö jakaantui vapaaehtoisiin "meihin" ja yritykseen "heihin". 2) Sisäisten ja ulkoisten motivaatioiden jaottelun sijaan löytyy yksilöllisiä muuttuvia motivaatio-yhdistelmiä, jotka ovat sidoksissa vapaaehtoisten ihmissuhteisiin ja heidän muuttuviin teknologisiin objekteihin ennen kieliteknologia- projektiin osallistumista ja sen aikana. Harrastuksen ja työn raja on hämärtynyt, minkä perusteella vapaaehtoisuuden-käsite voidaan kyseenalaistaa. 3) Julkisen sektorin IT-diskurssi näyttäytyy dilemmaattisena, toisaalta puheena käyttäjän valinnanvapauden takaamisen tärkeydestä ja toisaalta puheena käyttäjän työpöytäohjelmistojen paremmasta kontrolloitavuudesta. OpenOffice.org yhteisön ja paikallisen käyttäjän välinen yhteys on heikko ja sitä välittää ongelmallinen IT-henkilöstö-käyttäjä-suhde. 4) Yhteisön käsikirjoittaminen voidaan nähdä uutena hybridin yhteisön johtamiskäytäntönä. Yhteisö-käsite on monimerkityksinen, ja siksi strategiseksi välineeksi sopiva. Sitä voidaan käyttää moninaisten todellisten ja kuviteltujen yleisöjen vetoamiseen, kuten yhteisöjohtajan uusi globaali jäsenyysretoriikka todistaa. 5) OpenOffice.org-projektin ja julkisen sektorin vaihtuvat ja ristiriitaiset diskurssit havainnollistavat avoimen kehittämismallin muuttuvaa kehittäjä-käyttäjä-suhdetta. Tätä kehitystä luonnehtii muutos hakkeri-etiikkaa ja basaari-hallintoa korostavasta puheesta strategisesti säädellympään yhteisöpuheeseen. 6) Yhteisönä OpenOffice.org on samanaikaisesti todellinen ja kuvitteellinen, ja sitä voidaan kuvata "pakenevaksi yhteisöksi". Diskursiiviset teot ovat luonteenomaisia hybridiin projektiin osallistumisessa. Hierarkiat ja rakenteet syntyvät diskursiivisten tekojen kautta.

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ues to work in this mode "after work". However, for me, this is not the best way to be creative. The brain needs a different kind of relaxed state where thoughts can be merely observed. My thanks to you, my wonderful yoga teacher training buddies for our explorations on the "self" and the "I".

My close friends have seen my ups and downs and have always been there for me. For that I am tremendously grateful. My caring and wise parents Anneli and Michael Freeman, and my brother and close friend Robert Freeman, have offered me their unconditional love and support in pursuing my academic career. Thank you for the inspiring discussions and psychological support.

I dedicate this book to my beloved husband Joni Freeman. You were the fount and inspiration of this research.

Helsinki, 27th of September 2011

Stephanie Freeman

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1 INTRODUCTION

> ...I feel a little shy rhapsodizing about "community," especially as I live in California and feel, justifiably, that the term, community, has lost through overuse the precision of its contours and gained in weak exchange a smooth but uselessly warm California feel. But would "collaborative environment" really do instead? No: For Open Source, the term "community" is apt; it just should be used precisely, and indicate a working community, predicated on trust and collaboration...

As the quotation above by the OpenOffice.org Community Manager on the project's website indicates, "community" is not an easy concept to use when trying to characterize open source software development, even for a community member. However, in everyday speech, as well as in academic writings about open source, values such as togetherness, connectedness, collaboration, shared goals and motives, socialization, and collective ownership are often mentioned. Too little thought is given to its many uses and rhetorical power. Likewise the concept of open source and the open development model associated with it have been characterized in academic writings and in open source advocates' speech as ideally empowering the user with respect to access, choice, development and distribution of software tools (e.g. Benkler, 2006, Lessig, 1996; von Hippel, 2005). Contemporary spokesman and scholars view open source development as a new form of volunteer work activity characterized by "hacker ethic" (Himanen, 2001) and "bazaar governance" via the self-selection of tasks by volunteers (Raymond, 2000). Because the open development model is conceived as the information society's future model of globally distributed and shared work (Moon & Sproull, 2002) and knowledge production (Benkler, 2003), understanding its developmental dynamics is necessary. Further, the question of intellectual property rights and the way software production should be organized is a central issue in the discussion of the development of the "information society" (e.g. Boyle, 1996).

While open source projects may to some extent live up to these communitarian ideals, a critical historically rooted viewpoint is missing. For instance, people involved in the development of the paradigmatic open source project "Linux" used to be programmers with a personal need for a working operating system. Its development started as an effort by a user-developer and grew quickly into a large project with hundreds of user-developers as contributors. As the project grew it had to be modularized, which meant breaking up the code

into manageable units. Despite this, the division of labour did not change: competent user-developers continued to do the coding.

However, with the emergence of "hybrid"[1] firm-initiated and sponsored open source projects oriented towards end-users, it seems that the people doing the coding are not necessarily the people doing the using. The "OpenOffice.org" project studied here, represented such a project. It developed an end-user office application also named "OpenOffice.org". The change in the object of activity of the open source community from programmer software to end-user software inevitably changes the nature of that community, the developer-user relationship, and the discourse of community and membership constellation. In the OpenOffice.org project a set of office software applications were developed in which both volunteers and the firm's employees were working together. Since volunteer members can leave the project at any time, hybrid projects are faced with the challenge of attracting new members (especially volunteer programmers) and retaining old ones. While participation is voluntary, community management and construction in open source hybrids is also intentional.

This study aims at shedding light on issues of community construction and maintenance in hybrid open source by asking the questions 1) How is the structure and membership constellation of the community, specifically the relation between developers and users, discursively constructed in hybrid open development? 2) What characterizes Internet-mediated "virtual" communities and how can they be defined? How do they differ from hierarchical forms of knowledge production on the one hand, and traditional volunteer communities on the other? Today firms are to a growing extent utilizing or experimenting with open Internet-enabled platforms of product development, interacting with "lead-users" (von Hippel, 2005) or "prosumer communities" (Tapscott & Williams, 2007) or "crowdsourcing" (Howe, 2008). Hence, the findings could be also of value for companies acting in volunteer communities.

This study seeks to neither debunk nor romanticize open source communities. However, in order to go beyond "Free/Libre Open source" (FLOSS)[2] rhetoric and grasp the lived reality, FLOSS technology too should be approached as an inherently power-laden and ambivalent phenomenon (Berry & Moss, 2007; Winner, 1985; Woolgar & Cooper, 1999). ICT technology and text are inherently intertwined (Woolgar & Cooper, 1999, p. 443), which suggests that technology has no meaning without the human discursive practices associated with its development and use. Hence it is important to explore the rela-

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[1] The metaphor "hybrid" is borrowed from biology and it designates "an offspring resulting from cross-breeding" (http://en.wikipedia.org/wiki/Hybrid) not capable of reproducing.

[2] "FLOSS" is a term used by researchers for acknowledging both the ideological and pragmatic dimensions of free and open source software.

tion between academic discourses and actual discursive FLOSS practices. The purpose of this study is to explore the assumptions, theories and myths related to the open development model by analysing the discursive construction of the OpenOffice.org community: its developers, users and management, and Finnish Public Sector Information and Communication Technology (ICT) decision making concerning FLOSS use.

The theoretical approach used in this study combines sociological, psychological and anthropological concepts of community. These are used as complementary viewpoints for understanding community and for analysing the relation between the "real" and the "imagined" in so-called "virtual" FLOSS communities. Since writing is the dominant form of communication in the studied online community, an approach that focuses on language use in the construction and emergence of the community is justified. Hence, *intermediary* methodological and analytical *concepts* are adopted from discourse theories. I briefly outline the discursive-rhetorical approach (Billig et al. 1996; Fairclough, 1992; Mulhauser & Harré; 1999; Shotter, 1993; 2003; Skinner, 2006) further developed in this publication as a methodological toolkit for studying Internet communities.

"Virtual or online ethnographic" data such as mailing list discussions and web-pages (Hine, 2001; 2008, pp. 257–271) were complemented with phone interviews between 2003 and 2007 from the large hybrid commercially sponsored open source software development project "OpenOffice.org". This period was important because the text editor OpenOffice.org was going through significant changes and the project seemed to be growing fast. Additional face-to-face interview data were collected in 2007 from four end-users organization from the Finnish Public Sector, who either used or had considered using FLOSS-based tools. Combining these sites enabled the exploration of the relation between global development and local use.

The notion of community is approached from four complementary points of view along with complementary methodological tools, levels of analysis and sets of data:

Volunteers as members of the community. I analyse volunteers' conceptions of the hybrid community by analysing the themes that emerged from discussions among volunteers and between volunteers and the firm and the use of the linguistic device of *contra-positioning* in an episode leading to the demise of the OpenOffice.org sub-project Groupware.

1. The individual contributor's attachment to the project. OpenOffice.org Lingucomponent volunteers' changing motivations are analysed through types of contributions and personal paths of participation.

2. The end user as a member of the community. I analyse public sector end-users' argumentation for and against open source tools by analysing dilemmatic discourses.
3. The Community Manager as a member of the community. I analyse the OpenOffice.org Community Manager's articulation of the community on the project's web pages during 2000-2007 through changing community membership categories.

The book is organized as follows. Chapter 2 describes the historical context this study and foregrounds the research task and research questions. Chapter 3 introduces and evaluates evolving conceptualizations of open source. Chapter 4 outlines the theoretical and methodological approach. It comprises two distinct sections. The first part introduces the four community concepts used as sensitizing resources. Then it describes a methodological and analytical toolkit based on a discursive-rhetorical approach. Chapter 5 describes the field research process and data-collection. The empirical chapters 6, 7, 8 and 9 address specific research questions which can be seen as distinct entities and fields of research in their own right. Each empirical chapter includes a discussion of its findings. Chapter 10 draws together the empirical conclusions and then discusses the main conclusions and their generalizability. Issues of validity and reliability are addressed throughout the writing process (Cohen and Manion, 2000).

2 THE HISTORICAL CONTEXT FOR STUDYING OPENOFFICE.ORG

One of the most pressing issues in discussions concerning the development of the information society has been how to organize the production of software (e.g. Boyle, 1996). Software production can be distinguished roughly by two different kinds of business logics. The proprietary model relies on the private ownership of software code and charges for software licenses. The open source model relies on the public ownership of code and searches for income in additional services, application and hardware development. However, when firms started joining open source communities in the turn of the millennium, hybrid communities started to emerge. In addition, a firm may today conduct both open and proprietary development and consultancy. Open source is indeed increasingly used as part of the firm's services. This trend has followed to a greater extent from new companies building their solution on open source rather than established firms changing their products or business models.[3] Hence, the open-closed dichotomy is not so straightforward in today's business environment. Further, also the "open" model of software production is characterized by different degrees of openness. While the Free Software Foundation advocates "free software" as an ideology (Stallman, 1984), the Open Source Initiative promotes "open source software" as a pragmatic approach to producing better software and as a viable alternative to proprietary software[4].

In this study I define the open development model (ODM) as Internet-mediated geographically dispersed software development activity, in which the source code is publicly accessible, modifiable and redistributable to programmers. The starting point and necessary condition for this kind of activity has been volunteer participation and self-selection of tasks (Weber, 2004, p. 62). I prefer to use the notion "open development model" and not "free and open source software" because it directs attention to the organization, community, and the user-developer relationship thus making it easier to explore the hybrid model of open source, which is the focus of my analysis. Hence, the purpose of this chapter is to provide background and motive for the research task (see Figure 1 in chapter 2.4) by rendering visible the changing user-developer-relationship in the open development model.

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[3] See Rönkkö et.al. (2009).

[4] See http://www.opensource.org/.

2.1 Promises of the open development model: user freedom, democracy and transparency[5]

It is claimed that open source can democratize innovation, empower the user, and make Internet-based society more transparent (e.g., Benkler, 2003; 2006; Lessig, 1999; 2009; von Hippel & Krogh, 2003; von Hippel, 2005). von Hippel (2005, p. 5) uses open source as an exemplar of user-driven innovation and anticipates a future where a "few fits all approach" no longer appeals to heterogeneous user needs; where users are increasingly able to innovate for themselves; and where public policy making should support user innovation. Franke & von Hippel (2003) propose that in order to better respond to heterogeneous market demands users be equipped with "innovation toolkits" or "user toolkits". Such tools are already used in the open source Apache project. They claim that a user-driven approach can better satisfy an array of user needs. Franke & von Hippel (2003) suggests that users have the kind of "sticky information" that is costly to acquire, transfer, and use in a new location. Thus if users are innovators, the information needed in technical decision-making is readily there. Moreover, innovations developed by users have the potential to benefit non-innovators too (Franke & von Hippel, 2003, p. 1200). von Hippel's view of future innovative activity envisions firms externalizing the development of new products and services to these "innovation communities". Henceforth, he claims, firm strategies will be based on the utilization of the ideas and prototypes created by these communities.

Benkler (2003; 2006) regards users' freedom to choose and join projects without requesting anyone's permission the foundation of peer production. He cites open source development as an exemplar of what he calls "commons-based peer-production". Benkler underlines that socio-technical systems of peer production offer not only an important medium of production for various kinds of information goods, but also serve as a context for positive character formation (Benkler, 2006, pp. 394–395) by fostering important moral and political virtues such as democracy, autonomy and social justice (p. 419; Berry & Moss, 2007; Perry and Fitzgerald, 2005).

Lawrence Lessig (1999) takes a transparency perspective on open source in his book *Code and Other Laws of Cyberspace*. He sees that open source could be a solution for making cyberspace more transparent and hence more democratic. He maintains that cyberspace is a different space from the real physical place we inhabit. Lessig sees software architecture as a kind of law in the sense that it controls what people can and cannot do. In my mind, this code-as-law or transparency or control-approach to technology resonates with Langdon Win-

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[5] This section comprises some slightly modified paragraphs of a chapter that will be published in an article in the Information Technology and People journal (see Freeman, forthcoming).

ner's (1985) view of technology as inherently political. Woolgar & Cooper (1999) urge science and technology researchers to explore the essential ambivalence of artifacts:

> This [ambivalence] requires us to give centre stage to our mundane experiences of technology, and to all the contradictions and tensions involved: technology is good and bad; it is enabling and it is oppressive; it works and it does not; and, as just part of all this, it does and does not have politics. These tensions are a significant manifestation of the competing discourses to which our experience of technology is subject, and within which we make sense of them (p. 443).

Lessig's point that "code codifies values and yet, oddly, most people speak as if code were just a question of engineering" (2006, p. 78) would appear to be incontestable. According to Lessig, if we take the view that code is law, we should opt for transparency in the regulation of cyberspace by means of open code. His concern is that "liberty will not take care of itself", which means that we should be aware of the values and norms embedded in software architectures and select those that guarantee a freer society (Lessig, 1999, p. 58). We should ask how code regulates, who the code writers are, and who controls the code makers (Lessig, 1999, p. 60; see also Lessig, 2006, p. 207). Lessig's viewpoint highlights the embeddedness of values in technological decision-making. Hence, one should ask questions related to power in and over code, i.e. questions related to transparency and openness in open source projects and IT governance. To who is participation open? Who are the developers and users? Who controls the selection of software tools, and how is their use and implementation regulated?

In order to understand where these general social implications come from, and how they resonate with recent developments, a necessary step is to examine some historical origins of the open development model.

2.2 Historical roots of the open development model

The purpose of this section is to provide a historical background for my research questions concerning the changing open development model. By understanding earlier events and different ways of organizing software production, we can gain better understanding into the current myriad forms and communities related to the development of open source.

The open development model of software production is intrinsically bound up with the changes in the nature of the computer. In the 1930s and 1940s the computer was the size of a room (mainframe computers and time sharing sys-

tems), and hence very different from today's desktop computer. The larger dissemination of the PC to the masses has been linked to the maturation of the Internet and the World Wide Web (Ceruzzi, 1998). Various historical accounts and interpretations of origins of the open development model have been presented (Ceruzzi, 1998, Aspray & Ceruzzi, 2008; Schwarz and Takhteyev, 2010). I have taken up from literature the historical events that are central to the argumentation put forward in this book. While Ceruzzi (2008) aptly reminds, "One should resist any attempt to find a single point of origin of computer networks" (p.10), it should be kept in mind that the following historical narrative describes only some exemplary events that contributed to the emergence of the open development model, as it is known to date. The account, therefore, is not intended as any comprehensive history of open source software. Indeed, things were happening at the same time in many different places, and accounting for all contributing events would be a task in its own right. The purpose of the following phasing is to draw attention to the change in the object of production and related developer "community". Hence, the main point is that when we move from a product that it developed and used by the programmers themselves, user-developers, to a product that is targeted for end-user use, the "community" constellation and dynamics change: the "developer" and "user" and no longer necessarily the same person. This leads to the constitutive problem in software design, namely, how to take into consideration to needs and requirements of the end user (e.g. Friedman, 1989, pp. 189).

I what follows, I will describe events from four different decades[6], that have contributed to the emergence of the open development model. These events were identified on the basis of the form of organization and constellation of developers, the changing role of users, and the nature of the product developed. What unites the three first three decades is that developers (primarily researchers or academics) were simultaneously users, and the products were initially built for own use. The fourth phase marks a movement from developing for own use to developing products targeted for end-users.

The phases and events are:

1. The development of the ARPANET in the US military force's scientific networks, and the development of UNIX-operating system in the local scientific networks of Berkeley University by researcher-developers in the 1960's and 70's.

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[6] This phasing is adapted and slightly modified from Miettinen, Toikka, Tuunainen, Lehenkari, and Freeman (2006).

2. The institutionalization of open source: GPL and the Free Software Foundation in the 1980s by Richard Stallman, a software "hacker", researcher and idealist.
3. The establishment of open source software production communities and the Open Source Initiative (OSI) in the 1990s–Linux as the paradigmatic example of Internet-mediated open development.
4. The emergence of hybrids of open source communities and corporations in late 1990s and 2000s. OpenOffice.org and GNOME are examples of such hybrids.

2.2.1 ARPANET and UNIX: open development in local scientific networks in 1960–1970

Some of the early roots of the open development model can be traced back to the development of "ARPANET" and the "UNIX operating system" around the end of the 1960s. Both events are important to briefly describe because: 1) ARPANET is generally considered the predecessor of the Internet 2) The UNIX operating system underpins almost every system on the Internet (Ceruzzi, 2008, pp. 9-43, Ceruzzi, 1998, pp. 281–306).

The ARPANET grew out of a project funded by the U.S. Department of Defense's Advanced Research Projects Agency, ARPA, (later "DARPA") in the mid 1960's (Ceruzzi, 2008, p. 9). Lawrence "Larry" Roberts, director of ARPA's Information Processing Techniques, learned about a new communication method for passing information in a network. The new packet switching computer network connected important research organizations in the United States. Although access to ARPANET was limited even on university campuses at first, it later became more widely accessible within the scientific community. Further, ARPANET-inspired similar packet switching networks were established in U.S. Universities thereafter, BITNET and USENET to name a few (Ceruzzi, 2008, pp. 9–43). In 1983 the ARPANET network switched this technique to a set of protocols called the "Transmission-Control Protocol/Internet Protocol (TCP/IP), fundamental to the working of the Internet, as we know it to date (Ceruzzi, 2008, p. 11). In essence, the people contributing to the development of ARPANET were academics (developer-users), who were thus able communicate and collaborate with each other from distance.

Also an important event in the history of the open development model was the development of the UNIX operating system. The key developers of UNIX were two American researchers from the AT&T Bell Labs, Dennis Richie and Ken Thompson. Later, researchers from the Universities of Berkeley, Carnegie-Mellon, and MIT also participated in its development (McKusic, 1999, p. 35). In 1956 the US government prohibited AT &T from expanding its activity

outside the telecommunications business, which meant that UNIX could not be commercialized (Moody, 2001; Weber, 2004). AT & T's strategy was to license UNIX and its source code to universities at a nominal fee of 100 USD. This way it could be used for educational purposes. Students could look at the source code and learn how it works. In 1975 UNIX was used in over 40 US Universities and research laboratories (Weber, 2004, p. 29).

The development of UNIX contributed to a new conception of software development by enabling the incremental building of software so that many could contribute simultaneously (Ceruzzi, 1998, p. 332)[7]. UNIX acquired both technical and social characteristics that set it part from other programming systems, and contributed to the understanding Linux development (Ceruzzi, 1998, 332–333). The benefits of UNIX and the C-programming language were for example transferability[8], the simplicity of the software architecture, and flexibility–the combinability of different programs (Raymond, 2000, p. 23). The researcher-developer networks, both in universities and in companies, crossed organizational boundaries, thus quickening the pace of development and changing the model of development. The Berkeley Software Distribution (BSD) became the largest and most efficient distribution channel for UNIX (Moody, 2001). Bill Joy, the co-founder of Sun Microsystems[9], was among those involved in the BSD network (Ceruzzi, 1998; Raymond, 1999; McKusic, 1999; Moody, 2001). Although UNIX was initially written by and for researchers, it also gained wider use (Ceruzzi, 1998, p. 284). The inclusion of Bil Joy's TCP/IP stack in to the BSD UNIX was instrumental in the democratizing of internetworking because it helped transform the restricted ARPANET to the wide-open Internet (Ceruzzi, 1998, p. 284).

2.2.2 Institutionalization of open source: the General Public License and the software foundation in the 1980s

A key enabling mechanism in the institutionalization of open development was the "Copyleft"- principles and the General Public License (GPL). These were pioneered and mostly written by Richard Stallman, a well-known Free Software advocate. Stallman formulated them to keep his own projects, "Gnu Emacs" text editor and the "Gnu Hurd" operating system, developed originally as alternatives to commercial development of UNIX in 1983, free for everybody. Although open source software licenses come in many forms (Siltala, 2003),

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[7] See also: http://www.faqs.org/docs/artu/ch01s06.html.

[8] Transferability means that a computer program is easily transferred from one operating system to another.

[9] The sponsoring firm of the OpenOffice.org studied in this book.

what distinguishes them from proprietary ones is that they are based on an entirely different conception of intellectual property. The source code is generally kept open so that anyone can view, modify and in some cases, distribute their modifications to others. However, what many refer as "public domain software" is a legal term for software that is not copyrighted. Stallman emphasizes that this should not used for talking about free software.[10] Hence, Copylefted software is free software whose distribution terms warrant that all copies of all versions carry similar distribution terms. The objective is to guarantee that the software programs remain freely available, distributable and modifiable. The licence also restricts software from ending up in commercial ownership (Stallman, 1984).

> Copyleft refers to "a general method for making a program (or other work) free, and requiring all modified and extended versions of the program to be free as well" (http://www.fsf.org/).

Stallman defined free software in 1984:

> Free software is a matter of the users' freedom to run, copy, distribute, study, change and improve the software. More precisely, it refers to four kinds of freedom, for the users of the software: The freedom to run the program, for any purpose (freedom 0). The freedom to study how the program works, and adapt it to your needs (freedom 1). Access to the source code is a precondition for this. The freedom to redistribute copies so you can help your neighbor (freedom 2). The freedom to improve the program, and release your improvements (and modified versions in general) to the public, so that the whole community benefits (freedom 3). Access to the source code is a precondition for this. A program is free software if users have all of these freedoms (Stallman, 1984, p. 8).

For Stallman and other advocates of the free software movement, freedom is attained through being able to use a program for any purpose: to study, redistribute, improve and re-release improved code. Hence, "free" did not refer to gratis but liberty:

> As our society grows more dependent on computers, the software we run is of critical importance to securing the future of a free society. Free software is about having control over the technology we use in our homes, schools and businesses, where computers work for our individual

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[10] http://www.gnu.org/philosophy/categories.html.

and communal benefit, not for proprietary software companies or governments who might seek to restrict and monitor us. (http://www.fsf.org/)

The Free Software Foundation (FSF) was established in 1985 for the purpose of pursuing the freedom of code and freedom of information. The FSF advocates free software adoption and campaigns against proprietary software.[11]

2.2.3 The establishment of open source software production communities in the 1990s

While important institutional foundations of the open development model were established earlier, this phase is marked by the emergence of globally dispersed open source production communities powered by Internet technologies. Because the Linux community is used as a reference point and paradigmatic example of such development (e.g. Benkler, 2003; von Hippel & Von Krogh, 2003; von Hippel, 2005; Weber, 2004), its trajectory and unique ways of organizing development are briefly recalled. According to Ceruzzi (1998), the wide use of UNIX in universities and other non-commercial locations contributed to the emergence of Linux, since it is through UNIX that developers started using what they were developing (p. 332).

In 1991 a Finnish computer science student and hobbyist, Linus Torvalds experienced frustration with the MS DOS operating system he was using, because it was unreliable and far too expensive. He gained acquaintance with UNIX and the C programming language during his university studies. He had also encountered Minix, a version of UNIX, developed for educational purposes by the American professor Andrew S. Tannembaum. Although the Minix code was available for view, it was not freely modifiable. All modifications to the Minix source code had to be approved by Tannembaum. The problem of not being able to modify the source, and the fact that it was hard to contact Helsinki University UNIX machines with Minix, led Torvalds to develop a necessary and more reliable operating system (Moody, 2001, p. 31). In the beginning, Torvalds was the only one developing the code (Torvalds & Diamond, 2001, p. 102).

Torvalds followed Internet newsgroups and posted an announcement to a UseNet newsgroup "comp.os.minix" thus revealing his intention to develop an operating system. Developers from around the globe answered his post and expressed their willingness to test his code. A couple weeks later the first version of Linux was downloadable from the Helsinki University server. Torvalds collected the names and email addresses of all those willing to test the system

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[11] http://www.fsf.org/.

and announced that they could start straight away (Torvalds & Diamond, 2001, p. 102; Moody, 2001, p. 35). The mailing list became an important collaboration tool in the Linux project (see Torvalds & Diamond, 2001). The project started out from Torvald's personal need for an operating system and quickly grew into a global volunteer Internet-based "virtual" project. At this stage, the development of Linux changed from a one-man project to a community effort. The people engaged in the project consisted of university students, professors and self-taught hobbyist programmers–"hackers"–, thus forming a collaborative network of user-developers, developers who were also users but not all necessarily academics. The driving force of the community was competition over who would develop the best code and thus succeed in getting his/her piece of software integrated into the "core". At first all code modifications had to be approved by Torvalds himself, the leader and decision maker in the project (Moon & Sproull, 2002, p. 390).

As the project grew, the code had to be modularized. According to Torvalds and Diamond (2001, p.108), modularity–the formation of a system from independent but combinable parts–was the crucial factor for the development of Linux. However, proprietary software developer-companies like SAP[12] and Microsoft[13] also utilize modularity in their outside user and developer communities. In this sense the boundaries between the closed model and the open model appear fuzzy.

The Internet and modularity together can be seen as the enabling conditions for the simultaneous development of software irrespective of geographic location or time zone (Moon & Sproull, 2000). Modularity also affected the division of labour: for every module a person in charge was appointed who was responsible for the module's internal decision making. Gradually Torvalds gave a few chosen and trusted coders more power in decision-making (Iannaci, 2005, p. 16). It has been suggested that the project was organized into two "circles" (Moon & Sproull, 2000). The inner circle consisted of Linus Torvalds and his trusted module maintainers who "filtered out" code contributions. The outer circle consisted of a large crowd of programmers who reported bugs and made suggestions for improvements. Torvalds did not meet the other developers face to face for many years (Torvalds & Diamond, 2001, p. 151). The Internet is still the most important development tool and forum, and the quality of code would seem to be the main criteria in building trust (Torvalds & Diamond, 2001). If

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[12] The acronym SAP stands for "Systems, Applications, and Products in Data Processing". SAP is a professional social network community of SAP customers, partners, employees and experts (http://www.sdn.sap.com/irj/scn).

[13] Microsoft technical communities provide opportunities to interact with Microsoft employees, experts, and your peers in order to share knowledge and news about Microsoft products and related technologies. (http://www.microsoft.com/communities/default.mspx).

the quality of code meets the standards of Torvalds or his "lieutenants" (the module maintainers), the code committer is named in the Linux Credits File as payment for a job well done (Moody, 2001, p. 14). The person in charge of a module communicates with the external group of module maintainers. This is how a more complicated hierarchy was established in the project (Moon & Sproull, 2002).

Linus Torvalds also joined the Open Source Initiative (OSI)[14] founded in 1998 by Eric Raymond and Bruce Perens. The purpose of the OSI is to actively participate in Open Source community building and education, and to function as public advocacy for promoting awareness and the importance of non-proprietary software. The term "open source'" was invented to promote the new rhetoric of pragmatism and market-friendliness that Raymond had been developing.

> Open source is a development method for software that harnesses the power of distributed peer review and transparency of process. The promise of open source is better quality, higher reliability, more flexibility, lower cost, and an end to predatory vendor lock-in.[15]

"Sourceforge" hosts around 318, 008[16] open source code repositories while "github" hosts 3, 098, 237 different repositories[17].

2.2.4 The changing relationship between communities and firms in the 2000s

In the early years of Linux development its source code was mainly used as a platform for the further development of the code itself. When Linux started to turn into a viable and competitive alternative to proprietary software, people characterized as "end-users"–users that were not able to write or modify code–started using it. For such end-users, Linux was not a complex system of interacting source code modules and programming tools but a resource and tool in the office (Tuomi, 2001, p. 16). This new group of users contributed to the

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[14] Open source is defined by the OSI as follows: 1. Free Redistribution 2. Source Code 3. Derived Works 4. Integrity of The Author's Source Code 5. No Discrimination Against Persons or Groups 6. No Discrimination Against Fields of Endeavor 7. Distribution of License 8. License Must Not Be Specific to a Product .9. License Must Not Restrict Other Software 10. License Must Be Technology-Neutral (http://www.opensource.org/docs/osd).

[15] See http://www.opensource.org/docs/osd.

[16] See http://sourceforge.net. This was the situation in 2011.

[17] See http://www.github.com. This was the situation in 2011.

emergence of two kinds of firm-community relationship, in which both parties are dependent on each other (Dahlander & Magnusson, 2005, p. 487).

The first type of community-firm relationship can be characterized as symbiotic: both the firm and the community benefits from collaboration (Dahlander & Magnusson, 2005, p 487). The aim of the firm's business model is to package Linux to better suit the needs of the end user by adding a desktop environment and window system, as well as installation and user manuals to the kernel. Linux distributions (e.g. Red Hat and SUSE) are good examples of firms that are dependent on the open development model. The distributors also allow their developers to participate in the development of Linux. Although these packages are often distributed free of charge, a service provision fee is collected. Nowadays corporate-paid employees such as programmers and marketing- and sales personnel or distribution firms also participate in the development of Linux.

The open development model of producing software has firmly established itself as part of the software industry, and as a new form of software practice. The current phase of the open development model is characterized by the simultaneous competitiveness and intertwining of two very different methods of software production: open and proprietary. Further, this phase is also marked by the shift from developing programmer software to taking into account end-user needs either by packaging Linux as exemplified above or by starting to produce end-user software, as will be discussed next.

The second type of firm-community relationship emerged in 2000 when companies initiated open source projects by freeing in-house built code to volunteers. So-called hybrid open source projects, in which volunteers and firms collaborate, started to emerge. The corporate has representatives in the governing bodies and its employed staff work as module maintainers and project leaders, and contribute substantially to the core code construction (Shah, 2007; Siltala, Freeman, & Miettinen, 2007).

Siltala et al. (2007, p. 23) identify two types of firm-hybrid communities: firm-driven, "top down", in which was born out of firm-owned code (e.g. OpenOffice.org), and community-driven "bottom-up" originating from community developed free software but later attracting the interest of firms (e.g. GNOME). The first firm-driven hybrid before OpenOffice.org emerged when Netscape released its Web browser[18] Netscape Navigator source code to open source

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[18] "A web browser is a software application for retrieving, presenting, and traversing information resources on the World Wide Web. An information resource is identified by a Uniform Resource Identifier (URI) and may be a web page, image, video, or other piece of content. Hyperlinks present in resources enable users easily to navigate their browsers to related resources. A web browser can also be defined as an application software or program designed to enable users to access, retrieve and view documents and other resources on the Internet. http://en.wikipedia.org/wiki/Webbrowser.

developers in 1998. The Mozilla project was born, and with it the Firefox web browser. Netscape's role in the commercialization of the Internet cannot be underestimated (Ceruzzi, 2008). The hybrid community-driven GNOME was established in 2000 with the birth of the GNOME Foundation, which is a steering committee and legal branch of the GNOME project. Novell, Inc. and Red Hat, Inc together form a majority on the Foundation's eleven-member Board of Directors (Siltala et. al., 2007, p. 13). Sun Microsystems followed Netscape's example and released the code of its proprietary StarOffice[19] In 2000 Sun Microsystems aimed at building a volunteer community around the existing code base and named it the "OpenOffice.org project".[20] Sun (later, Oracle) was the main sponsor and developer of the OpenOffice.org code, thus remaining in control of overall development. Here "hybrid community" refers to the firm having representatives in the sub-projects and governing body of OpenOffice.org. The JCA (Joint Copyright Agreement)[21] and the LGPL license used in the project allowed the company to use the OpenOffice.org code in developing its proprietary StarOffice.

2.3 Research task and research problems

The research task of this study emerged from the historical developments in the open development model. The movement from "traditional" open source hacker projects like Linux to hybrid forms of open source such as the OpenOffice.org was characterized by change in the object of development. In the Linux community, the object was an operating system developed for and by other programming skilled user-developers. However, in the hybrid OpenOffice.org project initiated by Sun Microsystems the intent was to develop an office application intended for end-users by establishing a volunteer community around an existing code-base. This inevitably changes the community and the discourse used to describe the community. The dominating discourse on open source mainly characterizes programmer-to-programmer projects, shown in the triangle on the left in Figure 1. This study seeks to contribute to filling a gap in the existing research by investigating, with a view to identifying and explaining, the changing community and discourse of the hybrid open source community.

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[19] Perhaps the software most commonly known to the average computer user is Office software (Office productivity). It typically includes functions such as word processing, spreadsheets, presentations, drawings, web publishing, email, scheduling, and database applications". Other major browsers are the Internet Explorer, Google Chrome, Safari, Opera and SeaMonkey. "(http://en.wikipedia.org/wiki/World_Wide_Web)

[20] A historical account of Sun Microsystems is given in chapter 5.

[21] See Appendix 1.

Discourse on community and membership:
Hacker ethic; the Bazaar model and user
empowerment

**Hybrid
Discourse:** ?

Community:
"Hackers",
user-developers

Object/product:
programmer
software tools

Community: ?

Object/product:
end-user software
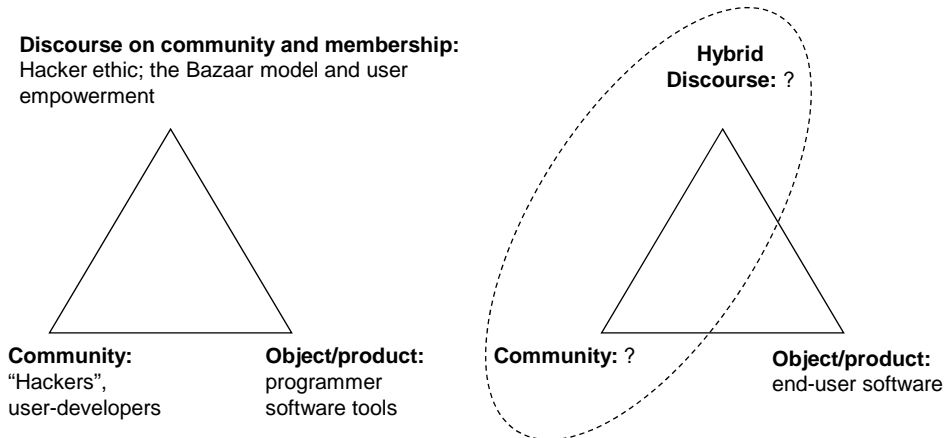
Figure 1. The research task: the challenge of understanding the discourse of communi-
ty and its membership in the transition from hacker to end-user oriented com-
munities. For the concept of object-oriented mediated activity system, see En-
geström (1987, p. 78).

On the basis of the transition depicted in Figure 1, I pose the following general
research questions: how is the structure and membership constellation of the
community, specifically the relation between developers and users linguistically
constructed in hybrid open development? What characterizes Internet-mediated
virtual communities and how can they be defined? How do they differ from
hierarchical forms of knowledge production on one hand and from traditional
volunteer communities on the other?

These general questions will be addressed through the following four more
specific research questions:

1. How is the hybrid OpenOffice.org community viewed by
   OpenOffice.org Groupware volunteer contributors?
   Do they find the combination of open source principles and business
   activity compatible?

One can presume that in a firm-community hybrid collaborative project like the
OpenOffice.org different conflicting interests will come together and collide.
The core difference between open source and closed in-house software devel-
opment is in the way intellectual property (in the form of software code) is
conceived and defined. While proprietary software businesses hold to the source
code as a trade secret, open source licenses assure the user the freedom to
access, modify and re-distribute software (e.g. Stallman, 2003). Thus, combin-
ing different underlying principles of intellectual property and cultures of soft-

ware development in a single project can be problematic (Siltala, Freeman & Miettinen, 2007; Weber, 2004). Studying the boundaries of the hybrid community will shed light on the interaction and power-relations between corporate developers and volunteers. More specifically, studying a failed sub-project (Bezroukov, 1999a) could help illuminate the unresolved controversies and dilemmas of hybrid open source.

2. What motivates volunteers to contribute to open source language development?
   What leads people to put time and effort into something for no financial reward?

The motivation of volunteer contributors is an interesting issue in open source projects, because money is clearly not a direct incentive. Thus, one can assume that recognition mechanisms and future career visions play an important part in volunteer participation (Weber, 2004, p. 135). How is the contribution of a volunteer recognized, and what do these recognition mechanisms mean to the individual volunteer contributor? What distinctive expertise does the volunteer feel s/he brings to the project? What do the volunteers hope to gain from participating?

One can assume that individual motivations are heterogeneous (e.g. Weber, 2005). For a distributed open source project like the OpenOffice.org project, it would seem relevant to know how volunteers get attached to the project and how volunteers can be retained as resources in the project. Especially interesting in the OpenOffice.org project, unlike many open source projects such as Linux, GNOME and Apache, is the fact that developer/programmers do not necessarily use the product(s) themselves, which means that they might not directly benefit in terms of acquiring better tools for themselves. This makes the issue of volunteer programmers' motivation and participation even more interesting.

3. On what grounds end-user organizations make decision with regard to Open Source software? What kind of arguments can be found in IT managers' and user advocates' speech about open source and how do user freedom and user control appear in these discourses?

Words such as "freedom", "empowerment", "democracy", "openness", "transparency", and "efficiency" are often used in the open source literature (e.g. Benkler, 2006; Lessig 1999, von Hippel, 2005). These attributions refer in a broad sense to the user's freedom to interact with software resources and to create tools for him/herself, thus expanding individual freedom. Since the concept of open source seems to bear a highly positive connotation, including in

the scholarly writings on the topic, it is important to understand how these values resonate in public sector discourses. As has been noted in science and technology studies (e.g. Hasu & Miettinen, 2005; Hyysalo, 2004), users often modify technology after its development. Similarly, users may use open source for different purposes and attach different meanings to it than those initially indicated in the literature. Hence, elaborating the underlying values and assumptions that ground the decisions of IT staff, as well as the power struggles involved in open source adoption, would seem a valuable exercise if its empowering possibilities are to be understood.

4. How do the OpenOffice.org "community" articulations by the Community Manager on the project's homepage change during 2000–2007?
Specifically, how are the boundaries and membership of the community defined: who is included and who is being influenced and recruited?

The word "community" is used in everyday speech as well as in academic discourse about open source software without much thought being given to its multiple meanings and rhetorical power. Since the Community Manager is a central character in the OpenOffice.org project, it would seem important to study the managerial authoring practices of building hybrid open source. The word "community" appears throughout the texts written by the manager. What exactly does "community" mean, and how does it resonate with other aspects of community construction, explored in the previous sets of research questions? Moreover, the role and centrality of texts in articulating the evolving purpose and identity of the OpenOffice.org project can help render visible the managerial challenges of hybrid open source. This viewpoint on community directs attention to the power and politics inherent in language use (e.g. Shotter, 1993; Skinner, 1989), which in the present instance, are related to questions of organizational image building by rhetorical means (Cunliffe, 2001) targeted at specific audiences.

3 EVOLVING CONCEPTUALIZATIONS OF OPEN SOURCE

Internet- and volunteer-based peer production communities like open source have received growing attention in the media and in scholarly work. Open source development has been characterized in academic theorizations and in open source advocates' speech as ideally empowering the user with respect to access, choice, development and distribution of software tools (Benkler, 2003; Himanen, 2001; Lessig, 1996; Raymond, 1999; Stallman, 2003; von Hippel, 2005; Weber, 2005). Further, the open development model associated with open source has been seen as a model for future distributed work characteristic to the knowledge-based economy (Moon & Sproull, 2002; Tapscott & Williams, 2007; Weber, 2005). Economic and social scientific research has explored issues related to individual motivation, socialization as well as project governance and structure, mostly in community-driven programmer-to-programmer projects (Crowston & Howison, 2005; Ducheneaut, 2005; Krishnamurthy, 2006; Lakhani & Wolf, 2005). Lately also hybrid company-volunteer open source communities have been studied (Berdou, 2007; Freeman, 2007; Shah 2006, Siltala, 2011). The following three sub-chapters examine the evolving conceptualizations of open source communities.

de Laat (2007) has characterized the change in the object of open source studies by reference to three topic areas of debate. The first topic has been concerned with questions related to spontaneous governance (motivation). The second topic has explored internal governance (e.g. modularity, division of labour, decision-making, indoctrination, formalization, and to the relationship between autocracy and democracy). In the third topic researchers have been interested in issues of governance toward outside parties, for example firms, national and international organizations and governmental organizations. Because open source is a rapidly moving object of study phenomenon this investigation has attempted to stay aboard by engaging in all three areas of debate.

First, I explore more circumscribed individual-centred explanations of volunteer motivation (e.g. Lakhani & Wolf, 2005), based primarily on hacker-ethic principles, and the distinction between intrinsic and extrinsic motivation (section 3.1). Then I discuss Eric Raymond's (2000) attempt to define the organizing principles of open development, the so-called "bazaar model" of Linux development (section 3.2). Finally, I discuss studies that have explored how firms, public sector organizations and end-users participate as developers or users in open source development, and how the bazaar model is not sufficient for studying contemporary state of affairs (section 3.3).

3.1 Programmers developing software for themselves: "just for fun"[22]

With the emergence of new forms of Internet- and volunteer-based peer production communities such as open source, the question of individual motivation has become important. Why make a contribution to collective use without receiving remuneration for it? Early open source studies and theorizations sought to categorize the motivation of hackers, that is, to explain the motivation of programmer/developers in programmer-to-programmer projects. The so-called hacker-ethic principles presented by Himanen (2001) characterizes open source programmers' motivation as an antithesis to the Protestant work ethic. Rather than seeing work as an obligation and seeing salary as the primary incentive, this contemporary diagnosis contends that programmers engage passionately and playfully, "just for fun" (Nikkanen 2002; Raymond, 1999; Torvalds, 2001), in the creation of useful and socially valuable software (Kelty, 2005; 2008; Levy, 1984; Raymond 2001; Stallman, 2004; Turkle, 1984; 1995; Ulman, 1997). However, the hacker-ethic principles paint a rather romantic and simplistic view of open source development and individual motivation (see also Coleman & Golub, 2008; Dahlander & McKelvey, 2005). Since then, various other approaches to examining open source developers' motivations have emerged. They have primarily dealt with motivation in two ways.

The first school of thought, conducted by management scholars (Bonaccorsi & Rossi, 2006; Bitzer, Schrettl & Schröder, 2004; Ghosh, 2005; Hars & Ou, 2001; Krishnamurty, 2006; Lakhani & Wolf, 2005; Luthiger, 2005), takes as its starting point the distinction between intrinsic and extrinsic motives (Ryan & Deci, 2000). White (1959) was the first to introduce this distinction[23]. According to Lakhani and Wolf (2005) intrinsic refers to doing something for the fun of it ("just for fun") while extrinsic refers to some external reward, for example salary or recognition in some other way (e.g.). They found that open source developers contribute out of a combination of intrinsic enjoyment-related motives and extrinsic motivations related to payment and a sense of obligation to the community. The same inner-outer distinction can be found in the work of Hars and Ou (2001). They report that external motivations–expected future returns and personal needs for software–play a greater role in explaining participation. In contrast, Lakhani and Wolf (2005) found that enjoyment-based intrinsic motivation related to sense of creativity when working on a project was the strongest driving force. Both studies conclude that open source motivations

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are heterogeneous, meaning that no one type of motive alone can explain participation in open source. Nevertheless, they divide volunteers into classes according to the strongest motive, and do not analyse the relationship between different classes of motives.

The second way of making sense of open source motivations is exemplified by Weber (2004), a political scientist. He attempts to synthesize earlier studies with his personal observations and discussions with volunteer programmers. Weber critiques the binary opposition of altruism versus self-interest in explaining volunteer motivation. He suggests discarding the assumption that volunteers participate because they are altruistic by explaining that it is common for open source developers to engage in intense and emotional fights over technical and organizational decisions. Consequently, he offers a list of motives that are related to aesthetics, career concerns, peer recognition and an ideological battle against Microsoft (Weber, 2005). Weber states that survey data alone cannot explain the diverse motives of open source developers and that other types of data are needed such as interview and mailing list data. While this argumentation is plausible, it remains unclear what data he has used and analysed.

More comprehensive/holistic studies of open source motivation also exist (Krishnamurty 2006; Mikkonen, Vaden & Vainio 2007; Shah 2006). The study by Shah (2006) was the first attempt of qualitative analysis in open source motivation research. She studied the motives of developers from two different open source communities with different governance structures. She found two groups of participants in both projects. "Need-driven participants" were motivated by the need to use the software in question for work-related purposes, by reciprocity, by future improvements and by career concerns. "Hobbyists", on the other hand, were motivated by fun, enjoyment and feedback from others. While both hobbyist and need-driven participants populated the "open source" community, the "gated source" communities mostly comprised need-driven participants. Despite that fact that Shah found that motives changed in two cases from need for software to hobby, she ends up more or less reproducing the binary opposition between intrinsic-extrinsic motivations.

The result is that the present corpus of knowledge on open source motivations has introduced several categorizations of motivations, but has also left several important issues unexplored[24]. Such issues include, for instance, the nature of the relationship between the different categories of motives; how motives are related to the specific technological artefact developed; how the motivation of an individual contributor changes over time; and how motivation

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[24] Survey-based analytical frameworks and research designs have lead to a focus on some motivational attributions at the expense of others.

changes across different projects. Earlier motivation studies tend to reinforce the hacker-ethic discourse presented by open source advocates by using as their starting point the dichotomized characterization of intrinsic and extrinsic motives. The analysis in chapter 6 partakes in this discussion and shows that motivations to contribute and participate are indeed more complex than have previously been suggested by these theories.

3.2 Developing governance and structure in open source projects: the Bazaar model

Eric Raymond–an insider of the open source movement[25] and an "observer-participant anthropologist in the Internet hacker culture" (Raymond, 2001)–was the first to attempt to explain the decentralized model of open-source software development. In "The Cathedral and Bazaar" (2000), he analyses the success and effectiveness of the Linux project in the evolution of the Internet. For Raymond, open source is first of all a more efficient and reliable way of producing software. Raymond sees no tension between open source development and business making. He contrasts the commercial proprietary "cathedral" model of software development to the "bazaar" model of Linux development. The models differ in their assumptions about the nature of the debugging task. While the cathedrals are crafted by "individual wizards or small bands of mages" working in isolation, Linux development resembles a "babbling bazaar of different agendas and approaches" (2000, p. 30). In my study, I define the propositions related to the bazaar model as follows: 1) developers are also users, 2) modularity of code makes it possible to add more developers, 3) modularity, openness and the Internet, enable heterogeneous localized variety, 4) open source software is more reliable and better quality than proprietary software and 5) managers in open source communities need not engage in traditional management concerns because open source projects organize themselves through self-selection of volunteers.

The first proposition–developers are also users–means that when users are also developers, time and resources are saved in articulating user needs and fixing software errors. "Release early, release often and listen to your customers" is a way by which the duplication of effort can be minimized (Raymond, 2000, p. 30). Non-source aware users tend to report surface problems and do not have enough background information or solutions to fix bugs. Hence, in the closed model, developers and users tend to be stuck in their roles and talk past each other (Raymond, 2000) as science and technology studies have shown (e.g.

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[25] Raymond is a programmer and his theories are based on his own experiments in developing FLOSS.

Hasu & Miettinen, 2006; Suchman, 1987). Open source development breaks this gap and makes it easier for the tester and the developer to communicate and understand each other due to a shared representation grounded in source code (Raymond, 2000, p. 33). According to Raymond, the precondition of the bazaar style of software development is that you have something to test to begin with, implying that collaboration requires that someone has coded something to begin with. Hence, the collaborative effort starts after someone has written the first version. This is something that often goes unnoticed because the assumption is that open source is collaborative from the start.

The second proposition–modularity of code makes it possible to add more developers–is nicely captured in Raymond's (2000) famous maxim "enough eyeballs, all bugs are shallow" or "Linus's Law", points to more users finding more bugs:

> Because adding more users adds more different ways of stressing the program. This effect is amplified when users are co-developers. Each one approaches the task of bug characterizing with lightly different perceptual set and analytical toolkit, a different angle to the problem "The Delphi effect" seems to work precisely because of this variation (p. 11).

The third proposition concerning modularity, openness and the Internet, enables the utilization of heterogeneous localized variety. This "Deplhi effect", or the utilization of localized variety, is related to the foregoing. It is claimed that the prerequisite of the open development model is the modular structure of the code. It enables the simultaneous development of many parallel chunks of code thus minimizing co-ordination and communication effort (Kogut & Metiu, 2000). The fourth proposition concerning the reliability and quality of open source software is related to the second proposition, the modularity of code. It is argued that as a result of the bazaar type of design, the difference between producer and user disappears and the quality and reliability of software increases (e.g. DiBona, Ockman, & Stone, 1999; Moon & Sproull, 2002). The fifth proposition has to do with project management. The leader of the bazaar project must have good communication and people skills but does not have to immerse himself in traditional management issues such as defining goals, monitoring, motivating, organizing and marshalling resources because "enjoyment predicts efficiency" (Raymond, 2000, p. 61). Raymond sees open source projects essentially as meritocratic communities in which technical competence is the basis of authority.

3.3 The inclusion of firms, public sector organizations and end-users in open source development

This section deals with some empirically based critique that has been leveraged in relation to the bazaar-model presented earlier. It explores the bazaar model in the light of hybrid open source and end-user organizations.

Firstly, the bazaar model as an ideal and idealized democratic type of governance and organization does not acknowledge the existence of power relations in technology development. Raymond's rather romantic view portrays open source communities as devoid of hierarchies and centralized mechanisms of power (Ducheneaut, 2005, p. 324; see also Bezroukov, 1999a, 1999b; Fitzgerald, 2006), and thus fails to address difficulties, failures and aborted projects[26].

Research has shown that even the Linux project has a hierarchical structure: Linus Torvalds and his trusted hackers had the power to decide which patch contributions to accept and which to reject from the large pool of peripheral user-developers (Moon & Sproull, 2002; Tuomi, 2004). Furthermore, a small group of contributors are responsible for the largest amount of contributed code, while a large pool of peripheral contributors develops the smaller portion (e.g. Prakash, 2000). Krishnamurthy (2002) states that FLOSS projects are not typically team-based at all. Of the 100 projects on SourceForge that he studied, he found a large number of one-developer projects and small developer teams. Moon & Sproull (2002, p. 383) have underlined that Linus Torvalds's management decisions and skills were just as important as his technical competence in the development of the Linux community.

O'Mahony & Ferraro (2007) examined the relationship between meritocracy and bureaucracy in the Debian community by analysing how the community created a shared basis of authority and governance over a 13-year period. In the beginning developer-users valued technical contributions. As the project matured, they increasingly valued organization-building contributors. O'Mahony & Ferraro (2007, p. 1083) argue that meritocracy and bureaucracy are not mutually exclusive when understood from a change perspective and suggest an emergent and context-dependent notion of meritocracy, underlining that democratic mechanism can serve an important adaptive function in new organizational forms. As Weber (2004, p. 259) has aptly noted, open source communities unquestionably have hierarchical elements but they are not based on an authoritative command structure as in bureaucratic organizations. In this sense they differ from traditional organizations.

The second critique is historically grounded. Due to the shift from hacker projects to hybrid firm-community projects, the ideal Linux bazaar model no

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[26] Chapter 6 examines a failed OpenOffice.org sub-project.

longer seems an adequate explanation. As a result, different attempts to characterize firm-community relationships have emerged. Dahlander & Magnusson (2005) studied four different cases in order to understand how different firms approached the company-community relationship. They found three distinct approaches: 1) symbiotic, in which both the firm and the community gain from collaboration; 2) commensaltistic, in which the firm gains and the community is indifferent; and 3) parasitic, in which the firm gains and the community loses (p. 487). Managerial challenges in such community-related activities had to do with norms and values, handling the different licenses required, attracting not only customers but also developers, allocating resources for community development, aligning different interests about the nature of the work, resolving ambiguity about control and ownership and avoiding conflicts (p. 489–490). Dahlander, Fredriksen & Rullani (2008, p. 117) argue that firms often participate in online communities as the protagonist of a single community.

The third critique is related to taking the core-periphery structure of Linux as the starting point for understanding the organization and division of labour of open source projects (e.g. Crowston, 2005; Crowston, Wei & Howison, 2007, Berdou, 2007). The open source development community has been characterized as having a hierarchical or multi-layered onion-like structure (Crowston & Howison, 2005). Instead of the core-periphery distinction, Crowston & Howison (2005) found four layers. At the centre of the onion are the core developers, who contribute most of the code and oversee the design and evolution of the project. The next layer comprises the co–developers, who submit patches that are reviewed and checked in by the core developers. Further out are the active users, who do not contribute code but provide use-cases and bug-reports as well as testing new releases (Freeman, 2007; Berdou, 2007). Further out still, and with a virtually unknowable boundary, are the passive users of the software, who do not speak on the project's lists or forums. (Crowston & Howison, 2005). Berdou (2007) on the other hand, studied a community-driven hybrid open source project, "Gnome",[27] and found that peripheral non-coding contributors (translators, document writers etc.) formed a kind of "autonomous periphery" marked by different aims, priorities and rhythms of participation than those of the code developers.

Hence, hybrid projects complicate the division of labour and the core-periphery divisions by bringing into play new members (Freeman, 2007; Siltala & al., 2007). Hence, in addition to redefining the notions of core and periphery, the boundaries of firm and community also need to be re-examined. As we will see, the core-periphery, as well as the developer-user distinction, can prove even more complex and more power-led in commercially driven hybrid projects like

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[27] My colleague Juha Siltala also studies the Gnome project in his doctoral dissertation.

OpenOffice.org (see Freeman, 2005; 2007, forthcoming). What also seems to be missing from the corpus of hybrid open source studies is the question of inclusion in and exclusion from the community. How do the volunteers articulate community boundaries, and how does the paid OpenOffice.org management strategically construct the "community". The forthcoming analyses will also show how community membership and community membership categories change over time and are closely connected to the transformation of open source on the societal level.

When we move closer to actual end-user organizations, the core-periphery relation gets even more complicated. A central question is how the visions of democracy, user freedom, and transparency by means of open code, are realized in organizations producing and using open source? While I acknowledge that most end-users will not need to access source code, it is essential that users have the freedom to choose their own software tools. Research on open source and the public sector has focused on IT managers' attitudes towards the (possible) adoption of open source mostly by means of surveys (e.g., Berry & Moss, 2006; Glott & Ghosh, 2005; Varian & Shapiro, 2003; Välimäki, Oksanen & Laine, 2005; West & Dedrick, 2005). A potential shortcoming is that these studies tend to exclude from their analysis the power relations between the actors involved. Those who have addressed the implications of open source use for the realization of democracy and extended public participation (e.g., Berry & Moss, 2007; Ghosh at al., 2007; Perry & Fitzgerald, 2005) have taken a somewhat uncritical pro- open source stance. Since many researchers have suggested that technology is inherently political (e.g. Winner, 1985; Berry & Moss, 2007; Van den Boomen & Schäfer, 2005), studying the power struggles involved in open source adoption would seem a valuable exercise if its empowering possibilities were to be understood.

While technologies enable and open up possibilities, they also establish boundaries and constrain our actions (Winner, 1985; 2009). In other words, the "same" technology can have very different consequences for different people. For instance, for one person it can mean more freedom at the expense of others' freedom. As I will show in the forthcoming analyses, freedom and control in technology development and use are two sides of the same coin. Wherever there are people involved, there are also bound to be power struggles and opposing interests. Chapter 8 clarifies the relation between public sector end user organizations and the wider open source "community".

4 THEORETICAL AND METHODOLOGICAL APPROACH

4.1 Concepts of "community'"

The emergence of globally dispersed Internet-mediated projects, enabled by new information and communications technology, have reintroduced the sociological, psychological and anthropological problem of the concept of community: how to understand togetherness and connectedness in globally distributed voluntary collectives in which face to face interaction is rare or absent? Since volunteers can basically come and go as they please, identifying organizational and community-boundaries is difficult. Is it possible to speak of a community in the case of a loose aggregation of 100 000 people who do not meet face to face or share the same language? How should one describe and approach such a disparate collection of individuals? What does membership mean in such a constellation? Internet-mediatedness, textuality, globalism, and ever-changing loose boundaries challenge the traditional notion of community.

Although the studies and conceptualizations discussed in chapter 3 seek to explain various aspects of open source communities, none of them explicitly discussed the concept of community except for a discussion of the specific concept of "communities of practice" (Berdou, 2007; Mahony, 2007; Takhteyev, 2009). Consequently, the first part of this chapter deals explicitly with the notion of community. First, it presents four different theories of community (Adler, 2006; Anderson, 1983; Engeström, 1987; Cohen, 1985; Delanty, 2010; Lave & Wenger, 1991; Lehtonen, 1995; Maffesoli, 1996). These concepts help in making sense of two key characteristics of open source communities: the "virtuality" or Internet-mediatedness and online-nature of the community under consideration, and the "hybridity" of that community. "Virtual" points to the "place" and form of communication between community members while "hybrid" refers to the corporate-community relationship. The approach developed here neither romanticizes nor debunks the idea of community but seeks to understand community as it is lived through concrete textual, discursive practices. These discursive practices are connected to the historically forming object of open source development, that is, the construction of objectual activity requires discursive construction of community. This approach is justified because writing is the dominant form of communication in the hybrid open source online community studied in this book[28].

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[28] Accessing data about actors working with their computers and with their contributions is impossible since they may live in any part of the world.

The motivation for choosing the following four community concepts[29] and the methodological approach is manifold. First, the problem of "community" cuts across social science-disciplines and therefore cannot be confined as the research subject of only sociology, only psychology or only anthropology. Capturing the complexity of the hybrid open development model, I argue, requires a multidisciplinary approach. Each discussed community concept offers a different but complementary angle to understanding the studied hybrid OpenOffice.org community. These complementary resources provided by the community concepts will be summarized in section 4.1.5. Second, I have been influenced by different disciplines and research traditions: behavioural sciences (adult education and psychology, specifically cultural-historical activity theory), multidisciplinary science and technology studies, and discourse theories, all heterogeneous fields of studies. Engaging in these diverse discussions has convinced me that "community" can be approached in many ways, and that these ways together offer a richer view than a single theory. Different concepts focus on different aspects of community: the individual, the collective, the structure, the content, boundaries and relations. Third, the chosen concepts are well known and used across disciplines, but rarely have they been examined together or in light of empirical evidence from Internet "virtual" communities lacking face-to-face communication.

The chapter starts from theorizations that emphasize community as a historically evolving form of organization and gradually moves towards conceptualizations emphasizing community as a way of being in the world–as a form of experiencing, expressing and communicating. While each introduced community concept is in some way a valuable resource for interpreting certain aspects of the studied community, no conceptualization alone is sufficient. Evolutionary structural approaches provide insights into organizations and hierarchies, but rarely consider the content of the identities and motivations that either unite or differentiate individuals. Further, the emergence of Internet-mediated communities has brought into being conceptualizations that implicitly emphasize the difference between "real" physical observable communities and fictive "imagined", "virtual" communities. Hence, four community concepts are discussed.

The "collaborative community" (Adler, 2006; 2007; Adler & Hecksher, 2006; Adler, Kwon & Hecksher, 2008) draws on the macro-sociological concept of community (cf. Tönnies, 1963; Durkheim, 1933) developed in the field of organizations studies. Hence it offers a heuristic for understanding modern professional community-like formations in hybrid open source. In the cultural

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[29] I am aware that also other community concepts could have been used, for example Van Maanen & Barley's (1985) "occupational communities" that Takhteyev (2009) has used in the field of open source studies.

historical activity theoretical studies, work communities are analysed in terms of object-oriented activity systems (Leontjev, 1978; Miettinen, 2005; Engeström, 2007; Taylor, 2009). This approach offers a more general socio-psychological model of mediated human activity, and is useful for understanding the social aspects of volunteer-like formations in hybrid open source. "Communities of practice" (Lave & Wenger, 1991; Holland & Lave, 2009; Wenger, 1998) is rooted in anthropological studies, and it is usable in studying open source for two reasons. First, it deals with changing membership in communities. Secondly, it helps in exploring boundary encounters and boundary construction between volunteers and corporate employees in open source communities. Lastly, the political-historical concept of "imagined community" (Anderson, 1989; cf. Castells, 1996; Cohen, 1985; Delanty, 2010; Maffesoli, 1996) is relevant for understanding the role of the imagined in participating and managing Internet-mediated hybrid open source. The idea of the role of the printing press in forming a nation-wide sense of community can be applied in understanding the global sense of community in hybrid open source through means of the digital press, that is, written communication.

It could be argued that the imaginary dimension is always present no matter what kind of community we are dealing with. Open Source communities, and communities in general, can be simultaneously both real and imagined. The connecting link between the real and the imagined is language use; in online communities this means written textual communication. The primary purpose behind the use of the various conceptualizations of community is to provide analytic means for discussing real-life communities. However, how such analyses in fact relate to and appear in light of the realities of real-observed open source communities requires a more sensitizing approach. In section 4.2 I will introduce a discursive-rhetorical framework to provide a concrete toolkit for the further study of discursive communities.

4.1.1 Collaborative community

Paul Adler (2006) and his colleagues (Adler, Kwon & Hecksher 2008) developed the notion of " collaborative community" to draw attention to how contemporary capitalistic society in fact needs non-capitalistic forms of organizations and communities in order to meet the growing demands of accountability, quality improvement and cost reduction. Adler studied specifically health care organizations (Adler & Hecksher, 2006). This new updated community concept is directly based on the classical sociological work of Ferdinand Tönnies and Emile Durkheim.

Tönnies was the first to distinguish between Gemeinschaft (community) and Gesellschaft (society) types of sociality. He found that modern society in

the turn of the century was witnessing a transition from a society marked by intimate relations and common belief-systems to a highly individualized (and specialized) society in which people acted on the basis of self-interest. Gemeinschaft represented a way of being that was valuable for its own sake, whereas the Gesellschaft type of getting together denoted an instrumental value. Tönnies' approach has been criticized for its strict conceptual divide and associated oppositional qualities (e.g. Brint; 2001; Delanty, 2010)[30]. Tönnies was concerned with the loss of community in the modern society, which has been interpreted as nostalgia for the past (see Delanty, 2010). For Durkheim (1947), the traditional community represented the real while society represented the imaginary:

> …Quite different is the structure of societies where organic solidarity is preponderant. They are constituted, not by a repetition of similar, homogeneous segments, but by a system of different organs each of which has a special role, and which are themselves formed of differentiated parts. (p. 181)

Mechanical solidarity refers to integration based on shared beliefs, while organic solidarity refers to integration resulting from specialization that requires interdependence. In organic solidarity individuals are dependent on each other for pursuing their interests and specializations. According to Durkheim the key to understanding the industrial society was its division of labour, the specialization of the functions and roles involved in production. Durkheim associated modern society with difference and individualist interests, dependent on division of labour and varied skills, that is, production based on complementarity. In this sense Durkheim anticipated the concept of "network" (see Miettinen & al., 2006, p. 8). Clearly then, Gemeinschaft and Gesellschaft as ideal types offer too crude a vocabulary to discuss, let alone advance our understanding of Internet-mediated open source communities lacking physical proximity and clearly definable boundaries, and in which the division of labour is highly specialized and motivations varied. Geographically dispersed global open source communities underline Durkheim's emphasis on division of labour because the ties between people are based foremost on the variety and complementarity of their

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[30] "…gemeinschaft is associated with common ways of life, gesellschaft with dissimilar ways of life; gemein-schaft with common beliefs, gesellschaft with dissimilar beliefs; gemeinschaft with concentrated ties and frequent interaction, gesellschaft with dispersed ties and infrequent interaction; gemeinschaft with small numbers of people, gesellschaft with large numbers of people; gemeinschaft with distance from centers of power, gesellschaft with proximity to centers of power; gemeinschaft with familiarity, gesellschaft with rules to overcome distrust; gemeinschaft with continuity, gesellschaft with temporary arrangements; gemein-schaft with emotional bonds, gesellschaft with regulated competition." (Brint, 2001, p.2–3)

skills, not familiarity, similarity or face-to-face interaction. In opposition to Tönnies, Durkheim's conception of community could be characterized as community of complementarity.

Adler and Hecksher (2006) and Adler, Kwon & Hecksher (2008) offer a more multifaceted view of community. They propose that different types of community can exist in parallel in contemporary institutions. In particular, Durkheim's idea of the complementarity of communities can be seen in the concept of collaborative community. According to Adler and Hecksher (2006), multiple forms of community provide an alternative to markets and hierarchies. They argue that capitalistic development erodes traditional forms of community while simultaneously creates new forms. They claim that neither hierarchical Gemeinschaft nor market-based Gesellschaft respond well to the growing demands of accountability, quality improvement and cost reduction within the liberal professions. Their argument is that capitalistic society needs non-capitalistic forms of organization in order to respond to these demands. The new coinage of collaborative community is an attempt to overcome the division between the two types, Gemeinschaft and Gesellschaft, and the collective-individual dichotomy that it entails.

According to Adler & Hecksher, (2006), ideal types like communities, hier-archies and markets emerge in hybrid forms and "in reality" professional com-munities comprise a mix of these:

> Hierarchy uses authority to create and coordinate a horizontal and vertical division of labour—a bureaucracy in Weber's ideal-type form. Market re-lies on the price mechanism to coordinate competing and anonymous suppliers and buyers. Community relies on shared values and norms. (p.15)

Characteristic of this new type of community is that knowledge is shared and created collaboratively, each individual complementing other individuals' contributions for the benefit of a shared purpose. It is simultaneously highly individual and highly collective (Adler, 2006; 2007; Adler & Hecksher, 2008; Adler, Kwon & Hecksher, 2008). This is an interesting insight and merits em-pirical exploration. While the traditional Gemeinschaf community was loyalty-based and relied on authority and status, and Gesellschaft market-oriented and contract-based, the collaborative community is based on trust and bound to-gether through interdependent contributions. The basis of trust is in contribu-tion, concern, honesty and collegiality.

The problem of the relationship between the collective and the individual is highly relevant for the study of hybrid open source communities. Since partici-pation is ideally volunteer-based, one can assume that the people who choose to

participate have some kind of overall common ground with respect to open source. Commitment can be political, practical or ideological, but no one of these need be the primary reason for participating. Otherwise there would be less cause to contribute. In this choice-based sense (Brint, 2001) open source collectives can be thought of as communities of interest. If a community is thought of as representing common ways of being, what kind of commonality required? It would seem plausible that communities vary according to the professional background, expertize, motives and contributions, even in professional expert communities that seem relatively homogeneous from the outset (e.g. Saari & Miettinen, 2001; Saari, 2003).

The hybridity of open source complicates the issue further. It can be expected that combining two historically and culturally different models of software development and distribution can lead to a collision between the norms of open source and those of the firm. Indeed, Siltala & al. (2007) claim that the relationship between corporate paid developers and volunteer contributors remains contested territory (see also Weber, 2004, p. 262). However, the idea that the collaborative community has a "mixed" character is a valuable insight and could help in conceptualizing hybrid open source as existing somewhere alongside markets and hierarchy. Since such projects have, ideally, both corporate developers and volunteers working together, it becomes relevant to consider the boundaries of the community, and the question whose good–that of the firm, the volunteers, or both parties–is being served? It should be emphasized, however, that the juxtaposition of firm and volunteers might turn out more uneasy and fuzzier than first anticipated. The collaborative community concept is well suited for understanding the professional aspects of hybrid open source communities and the co-existence of corporations and volunteers contributors. However, the basis of trust, as characterized above, can prove more difficult to achieve, as we will see in the forthcoming analyses.

4.1.2 Community as object-oriented activity system

The move from macro-level sociological concepts of community to socio-psychological theories stems from the need to understand the general principles of human activity: the functioning of the socially and materially rooted self. Within the cultural-historical activity theory (CHAT) tradition[31], communities and organizations have been conceptualized through the notion of "activity system" (Engeström, 1987) and related notions of "knotworking" (Engeström,

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[31] The Vygotskian tradition emphasizes individual development of a socially rooted self while the CHAT approach focuses on the collective activity and transformative social practices (see Langemeir & Roth, 2006; Silvonen, 2005).

2005) and "wildfire activities" or "mycorrhizae-like activity" (Engeström, 2007). Although the concept of community is not specifically discussed, it is included in the concept of activity system, which is the unit of analysis of CHAT studies. In this sense community is taken as a given and an ideal (cf. Taylor, 2009, p. 230). The key concepts of CHAT are cultural mediation by signs and tools, historicity, contradictions and the object-orientedness of activity[32]. The model of mediated activity was used in this study for depicting the research task (see Figure 1 on page 17).

Vygotsky's (1978, p. 54, edited by Cole, John-Steiner, Sribner & Souberman) idea of cultural mediation of the subject-object relation offers an escape from the Cartesian dualism between the subject and object, and the mind and the external world. Mediation refers to a two-way process of externalizing and internalizing through the help of meditational means such as signs and tools. The individual uses signs for communicating with others as well as for regulating her or his own behaviour. Tools are used as extensions of the human body and for transforming the object. Historicity refers to how things come into being. The idea of historically developing activities is a valuable premise for understanding communities as dialectic transformative processes.

Object-orientation of the actions of the people within a community are directed towards certain goals that contribute to something larger than any individual could accomplish single-handed. An object of activity is accomplished together by members of the community and it constitutes the motive and social meaning for activity. The object is not easily definable, because it is the outcome of a collective effort. It is open-ended and is constantly undergoing redefinition. Individuals attribute different meanings to the object of activity, and contribute to it via a division of labour by deploying and developing their specialized skills and expertise (Miettinen, 2005). The object of activity is not seen as merely a material product, but it also is projected and imagined by subjects. It constitutes a kind of "moving horizon" (Engeström, 2007, p.144), and therefore the motive of activity is simultaneously given and imaginary (Leontjev, 1978, p. 62).

Engeström (2007) suggests that in the fluid world of large-scale activist communities such as open source (comprising numerous, indefinable activity systems), objects may have more of a runaway character:

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[32]The model of activity system (with its systemic relations between subject, mediating artifacts, object and outcome, rules, community and division of labour) is mainly used in the interventionist application of CHAT, namely, developmental work Research. The present research does not use this methodology but instead uses some of its principles for understanding productive activities that are in a state of change.

Runaway objects typically have the potential to escalate and expand up to a global scale of influence. They are objects that are poorly under anybody's control and have far-reaching unexpected side effects…. They are contested objects that generate opposition and controversy. They can also be powerfully emancipatory objects that open up radically new possibilities of development and wellbeing, as exemplified by the Linux operating system. (Engeström, 2007, p. 11)

The runaway character of objects is an important insight and one that also illuminates my concern about the analytical usefulness of the notion of object of activity in connection with the present research: because runaway objects are mutable, in a sense "uncatchable", taking the object of activity as a starting point can be questioned. The object of activity is complicated to track due to the nature of dispersed open source communities. In this sense the community, its discourse and its object may seem very remote. Since the data are mainly drawn from mailing list discussions, interviews and web page writings concerning community building, the focus is on how different community members discursively construct their relation to the community.

Taylor (2009, p. 230) has suggested that the construction of community is neglected in CHAT:

Let me begin with a premise: a community is not just a part of the background, an enveloping context; it is an *outcome*. Community must be constructed, and in this sense it is also the object of an activity. It is granted, a given, but we should also bear in mind that it is equally a finality –an end to be accomplished…to me the failure to come to grips with this recursive reconstitution of community in the very realization of its activities is the greatest gap in activity theory, as presently understood.

Hence, we ought to explore where the community comes from, who it is, how it evolves and who constructs it.

In the analyses in chapters 6 and 7 I will show that the object of activity is a hard "thing" to grasp; in fact it seems that, owing to the unique patterns of individuals' motivations, and contributors' specialized tasks, the object is shattered into a collection of mini-objects, making it hard to understand what is "shared". Moreover, the analyses will open up the black boxed concept of community by showing how different community members construct their selves and others through their unique histories and patterns of participation, and how these are sometimes very "hiddenly" linked to the object of production of the OpenOffice.org community.

4.1.3 Communities of practice

The shift towards anthropological conceptualizations is motivated by the need to understand the formation of communities and the individual's point of departure. The seminal work by Lave & Wenger (1991) on "communities of practice" (CoP) directs attention to the learning practices in communities. "The association of "practice" and "community" yields a more tractable characterization of the concept of practice…by distinguishing it from less tractable terms like culture, activity, or structure" (Wenger, 1998, p. 72). Further, it underlines that communities evolve through changing memberships. These practices are not necessarily identical to those found in organizational units or formal structure. Instead communities of practice are social groups within organizations that come together because they share similar interests or want to organize in regard to a common theme. According to Wenger (1998), they are self-selective and exist as long as the members perceive they are getting value from participating.

> Being alive as human beings means that we are constantly engaged in the pursuit of enterprises of all kinds, from ensuring our physical survival to seeking the most lofty pleasures. As we define these enterprises and engage in their pursuit together, we interact with each other and with the world and we tune our relations with each other and with the world accordingly. In other words we learn…Over time, this collective learning results in practices that reflect both the pursuit of our enterprises and the attendant social relations. These practices are thus the property of a kind of community created over time by the sustained pursuit of a shared enterprise. It makes sense, therefore to call these kinds of communities, *communities of practice*. (p. 45, emphasis in original)

Membership in a community requires mutual engagement, joint enterprise and a shared repertoire (Wenger, 1998, p. 73). When people enter communities they bring with them their unique histories (Wenger, 1998; Holland & Lave, 2009). However, these histories are not theirs alone but "histories of articulations with the rest of the world" (Wenger, 1998, p. 103). In this sense, community members have to negotiate their intersecting histories and weave them into shared ones. On-going struggles over meaning, identity and membership are an integral part of communities of practice (Holland & Lave, 2009).

Lave and Wenger's idea of a community, then, is that, like community membership, the community itself is fundamentally negotiated and negotiable. Further, a valuable insight in the notion of communities of practice is the *multiplicity of communities of practices in a single person's life.* These communities may at times contradict each other, compete with each other for our attention and pose dilemmatic situations in which we may have to decide in favour

of one over the other (e.g., Dreier, 1999; Holland & Lave, 2009). We can belong simultaneously to many communities. Hence, it becomes important to consider the individual's points of entry and emerging patterns of participation in different, often elusive social practices and activities.

The "multimembership" (Wenger, 1998, p. 105) perspective draws attention to the boundaries and external connections of communities. Following Shibutani (1955) and Star (1991), Wenger (1998) proposes that boundaries can be explored in three types of "boundary encounters": one-on-one conversations between community members, encounters between visitors and hosting community, and meetings of delegations comprised of members from different communities. Boundaries are created and recreated in these encounters. Moreover, by focusing on discontinuities created by boundaries, issues of miscommunication and problems of co-ordination can be understood (Wenger, 1998, p. 254). Boundaries are closely connected to peripheries, because they are both on the edges of communities of practice, neither fully inside nor fully outside. They are organized and casual places where newcomers and outsiders meet old-timers and insiders (p. 117). In this study, boundaries are examined along two dimensions. The first is the discursive construction of institutional boundaries between volunteer contributors and paid contributors. The second is the practice-related boundaries between code contributors and user contributors, who do not provide code.

Connected to the idea of communities of practice and boundaries is the notion of "legitimate peripheral participation" (Lave & Wenger, 1991). This refers to the direction of newcomers' participation from being a peripheral member (an apprentice) to a respected fully-fledged core member (an expert). Hence the process entails the newcomer's gradual mastery of skills and expertise. However, the idea of one-directional movement has been criticized because it does not take into account movement from the core to the periphery (see also, 2007) or the possibility of some members staying on the periphery (Freeman, 2007). It does not take into account the formation of an "autonomous periphery" (Berdou, 2007) in its own right and that some are present in the core from the beginning. It does not allow for the possibility that there are more participatory layers in between, or for the events and motives preceding participation (see Freeman, 2007). Research on technological communities has emphasized the situated nature of technical problem solving in the shared "epistemic culture" of community members (Knorr-Cetina, 1999; 1997; see also Suchman, 2002). In Knorr-Cetina's (1999) study thousands of physicists worked together on a common project. Open source projects however take this a step further in that it is hundreds of thousands of individuals from diverse fields of expertise who participate in the collaborative effort. Of interest here is the ways in which technological communities of practice differ from traditional craftsmanship

CoPs, and how open source communities differ from other technological communities of practice.

While the CHAT approach acknowledges that the "object" is simultaneously imaginary and the CoP approach underlines the symbolic construction and struggle of community building, Anderson (1983) has explicitly proposed the concept of "imagined community" thus providing a useful way to unravel this side of community life. We turn now to his theorizing on the imaginary and on virtuality as reality–a notion of community rooted and grounded in communication. These approaches underline community as a form of belonging, experiencing and expressing.

4.1.4 Imagined communities

> …in fact all communities larger than primordial villages of face-to-face contact (and perhaps even these) are imagined. Communities are to be distinguished, not by their falsity/genuineness but by the style in which they are imagined. (Anderson, 1983, p. 6)

Anderson coined the term "imagined community" in his work on the rise of the nation state in 1800. His central thesis is that print capitalism made it possible for people from different dialects to understand each other and thus imagine a connection to the state-as-a-community through a common language. In "a world in which figuring the imagined was overwhelmingly visual and aural" (p. 23), textual representation, in the form of the novel and the newspaper, provided the technical means for imagining a community as large as a nation state. Anderson (1983) proposed that the nation is an imagined political community, and despite inequalities and exploitations, it is always conceived as a "deep, horizontal comradeship" (p. 7). In this sense community could be conceived as "a living dream or linking image"–as the union of dream and reality (Maffesoli, 1996, p. 88).

The emphasis on the written makes the notion of imagined community highly valuable for understanding globally stretched open source projects that feed on digital media. However, Anderson's preoccupation with print communication in enabling the imaginary has been criticized. According to Wogan (2001, p. 10), Anderson's account is based on popular linguistic ideologies, that is, the dichotomy between print and oral, and the assumption that nations must be monolingual. Imagining a community surely belongs also to the realm of oral communication. However, Wogan's distinction is unfruitful in the world of open source communities and digital media, in which the oral is mostly ex-

pressed through text[33]. In this sense digital media (information and communication technologies) can be seen as a continuation of the printing press or "Gutenberg's galaxy" (Castells, 1996, p. 358). Further, embedded in Anderson's notion of imagined community is the assumption of a common language. This raises the question: is shared language a prerequisite for a sense of community and communion? Here "shared language" refers to actual different written/spoken languages. For instance people who do not necessarily speak the same language are localizing the OpenOffice.org product in native language projects into hundreds of languages. The official language on the overall project's front page is English. How, if at all, does this divide between languages articulate into a shared sense of community? What and whose text is the integrating force of the community? Hence, issues of authorship and power become necessary in contemplating the boundaries of the community.

Cohen (1985) has found that people become most sensitive to their own culture when they encounter others', which means that their attitudes toward their culture are best found at its boundaries. He emphasizes the experience of the individual in community life and the symbolic construction of the community:

> Symbols are effective because they are imprecise, though obviously not content-less, part of their meaning is 'subjective'. They are, therefore, ideal media through which people can speak a 'common language', behave in apparently same ways, participate in the 'same' rituals, pray to the 'same' gods…(Cohen, 1985, p. 21)

> It is precisely this distinction between superficiality of structural form and the profundity of its conceptualization which validates the argument that structures imported into a community do not necessarily undermine the community's nor blur its distinctiveness. (Cohen, 1985, p. 75)

Interested and enchanted by the imaginary of everyday life, Maffesoli (1996, p. 57) describes the postmodern hedonistic tribal community as an emotional experience that "cannot be reduced to a single sphere of private, but is lived collectively to an ever greater extent". He believes that "sense of communion" can be illusory. What matters is belief in communication. The postmodern community forms around an image constructed according to a certain style–the "communitarian style"–, and in this process the role of the media is crucial. The interaction between myths and rationality comes to life through the gradual rationalizing of myths.

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[33] While the digital media nowadays also enable study of visual and aural communication, the data of this study, and the dominant form of communication of the research site, is digital print.

The community as a collective representation plays an important symbolic role (Maffesoli, 1996; Cohen, 1985; Delanty, 2010). While symbols and myths can be seen as integrating forces in community, they can also be seen as rhetorical and strategic devices for convincing different audiences depending on the intentions of the writer/speaker. The community as an object and product has to be sold: "There is no product without an image that makes it be known and allows it to be disseminated and sold" (Maffesoli, 1996, p. 107). For example in the OpenOffice.org community, despite the self-selection of tasks by the contributors, the Community Manager is on the constant lookout for new members. Hence, it is important that the image of the community appeal to the values and images of a variety of audiences.

Because it is physically and cognitively impossible to be active at the same time in many communities, members have to bring life into them by imagining. Imagining is powerful tool for orienting to the future for any member of a community. The following passage by Maffesoli (1996) nicely captures the power of an image/social representation:

> The image is…truly a "forming form" – of the individual certainly, the image itself but also the whole social ensemble that is structured thanks to and by means of the images it gives itself and that it must regularly recollect. (p. 97)

> The alterity at the hearth of "I", and in consequence, at the heart of the social as a whole, should be understood in this [ambiguous] way…It is this ambiguity, constitutive of contemporary modernity, that characterizes the style of our era and that may invite us to choose a communicational approach to subjectivity" ….The fusional 'we' takes on importance anew, as a concatenation of "we's", through which twirls each person (persona), multiple in itself. (p. 61).

In his trilogy *The Information Society*, Castells (1996) sees communities as evolving, highly specialized interpersonal networks. These new communities are essentially informational and communicative (Delanty, 2010; Rheingold, 2000), and they are based on weak ties and low transactions costs (Castells, 1996). Castells (1996) describes the postmodern information society as depicting a move from the Gutenberg's galaxy to McLuhan's galaxy, that is, from a world of one-way communication to a world of interaction and many-to-many communication. Computer Mediated Communication (CMC) has most likely transformed sociality in its mediatedness and immediateness in the sense that one quickly receives a response to ones' questions, but this does not mean that the open source community is an unreal place, as the word "virtual community"

designates. Castells's (1996) idea of "the culture of real virtuality", essentially mediated through symbols, is appealing:

> ……while the media have become globally interconnected, and programs and messages circulate in the global network, we are not living in a global village, but in customized cottages globally produced and locally distributed…there is no separation between reality and symbolic representation: …virtual: being so in practice though not strictly or in name ", and "real: actually existing Thus reality as experienced has always been virtual because it is always perceived through symbols that frame practice with some meaning that escapes their strict semantic definition. (p. 372)

Hence, there is no distinct virtual place as such on the Net, but rather a communicative and mental space where traces of the self are left through the act of writing. The Net and virtuality could be viewed more as a state of mind in that "the sense of place requires an act of imagination" (Rheingold, 2000, p. 21) Delanty's (2010) notion of "communication communities" sketches a view of communities as a place where new cultural codes and forms of belonging emerge, but what these forms of belonging are, is not discussed. However, valuable in his idea is the emphasis on communication, and that community exists in many forms and often these forms complement each other.

The discursive-rhetorical approach developed in the next chapter seeks to establish a connection between real communities vs. imagined communities[34], and the division between communities as structure and objective reality and communities as content and a sense of communion. Further, related dichotomies such as local vs. global, practice vs. promise, individualism/self-interest vs. communitarian/altruism, voluntarism vs. paid work, are also explored. Reconstructing the links between these distinctions makes it possible to see the "postmodern community" (Maffesoli, 1996) of the "information age" (Castells, 1996) in its complexity: to see what is old and what is new–what is borrowed, recycled and newly combined. As Lehtonen aptly (2000) points out, communities have not disappeared; they have just gained different forms.

4.1.5 Summary of the four community concepts as resources for this study

Since we cannot simultaneously be present and active in the multiple communities we feel we belong to, we have to keep them in a sense "alive" by imagining.

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[34] Delanty (2010) has also suggested giving up the dichotomy between real and imagined communities.

In particular in the open source communities studied here, where face-to-face interaction is missing, the role of the imaginary in participation could be even more heavily underlined. Moreover, I would argue that communities are simultaneously many things–community manifestations can be ideological, professional, political, practical, strategic and emotional. Hence, this study takes a multifarious approach to studying online communities.

> …the fragmentation of existence together with the partial and one-sided character of socialization under capitalism have inclined people to focus on particulars of their life , an individual, a job, a place, but ignore how they are related, and thus to miss the patterns – class, class struggle, alienation, and others - that emerge from these relationships…more recently the social sciences have reinforced this tendency by breaking up the whole of human knowledge into the specialized learning of competing disciplines, each with its own language… (Ollman, 2003, p. 3)

Although the community conceptualizations presented here operate on different levels of analysis, they also share certain themes. All community conceptualizations adhere to the view that communities are actively and socially constructed. However, the sociologically rooted "collaborative community" concept as well as the CHAT approach emphasize that social construction is essentially linked to material systems of production. Collaborative community, the CHAT approach and imagined community all see changing community forms as interlinked to larger historical forces of society. CHAT, CoP and imagined community all underline communication as means of community construction. However, the CHAT approach also included other kinds of tools, such as mailing list and web pages in the meditational means of the community. A similar endeavour across the presented community conceptualizations is the search for community boundaries–where the "community" begins and ends.

Table 1.   Summary of resources provided by the four community concepts

Community concept	Resources for this study
Collaborative community	Professional communities: simultaneously highly individual and highly collective, bounded together by interdependence
Community as object-oriented culturally mediated activity	Volunteer and professional activities: the object of activity and the use of signs and tools in constructing community
Communities of practice	Changing membership; boundary encounters and boundary construction
Imagined community	Sense of communion through written "print"

While the above community theorizations orient my study to the relevant *dimensions of community* (see Table 1), a set of more concrete analytical tools is needed when moving closer to the actual textual data. These *intermediary concepts* are found primarily in discourse theories. According to the idea of collaborative community, we need to look at the relation between individuality, collectivity and complementarity in professional communities. In light of CoP, we need to examine changing membership and boundary construction. Following CHAT, we need to look at the meditational means and objects of human activity. Imaginary community in turn invites us to investigate the sense of communion by focusing on written "print". To conduct these analyses in the study of the OpenOffice.org community, specific phenomena warrant investigation. First, I studied the collaborative community-dimension of hybrid open source through the discursive boundary construction between corporate employees and volunteers by identifying discursive themes leading to the closing of the code, and the use of plural pronouns in the contra positioning of volunteers and Sun Microsystems. Second, I translated the CHAT-dimension and CoP dimension of community into studying individual volunteers' types of contributions and personal participation paths for finding out their discursively articulated motives. Third, following the idea of "imagined community", I studied the discursive struggles related to open source implementation in end-user organization ICT decision-making and implementation. Fourth, I studied the idea of imagined community by exploring the discursive-rhetorical practice of authoring community on the project's web pages. In the next section, I propose the four slightly different but complementary intermediary concepts, based on a discursive–rhetorical approach, for studying different aspects of community and the construction of the user interface.

4.2 A discursive-rhetorical approach for analyzing the construction of community

> Who and what we imagine or try to imagine ourselves as being in relation to others, and the 'Otherness' surrounding us, is what determines the 'shape' of our motives and feelings, what we feel worth undertaking, and what we feel is intelligible and reasonable. (Shotter, 1993, p. 81)

In constructing my approach, I have drawn on several research traditions: 1) cultural and discursive psychology (Billig & al., 1988; Bronwyn & Harré, 1990; Harré, Clarke & Decarlo, 1985, Harré, 1998; Mulhauser & Harré, 1990; Shotter, 1993) 2) critical discourse analysis (Fairclough, 1992; see also van Dijk, 1993), 3) social psychology, specifically the work by Tajfel (1981) on social categories

and 4) the work by Quentin Skinner (2006) on changing political rhetoric. They have provided me with useful tools for variously approaching "community" on the level of speech. Shotter (1993) aptly connects the real and imaginary by grounding it in language use (parole):

> …the inclusion of a rhetoric of reality, a rhetoric which finds its grounding in the as yet unrealized tendencies in a culture's current background activities: in its realm of the imaginary. (p. 95)

Further, writing (written speech) is seen as rhetorical action with the goal of persuading specific audiences (e.g. Harré, 1998, 15). In this study discourse is understood broadly as socially and historically rooted dialogical practice. Community structures and community experiences are created through discourse. In the open source community studied in this book, all collectively shared acts are discursive acts. Here the action vs. discourse or talking-out–acting-out distinction no longer seems fruitful[35]. Talking out or more precisely, writing out, is simultaneously acting out. The OpenOffice.org community is approached as a *discursive-action community*.

Signs and symbols not only represent a state of affairs, but also work as a device or psychological tool (Vygotsky, 1978, p. 54, edited by Cole et al.) for controlling one's behaviour in social circumstances. Similarly, Fairclough (1992) sees that language both reproduces and transforms society. Our thoughts are given form only when we in engage in discourse, either by speaking or writing (Shotter, 1993, p. 13). The "self'" is constructed by speaking of oneself in relation to an object (Harré, 1998, p. 28). Similarly Mead sees the self as a process, where the individual experiences himself indirectly "from the particular standpoints of other individual members of the same social group or from the generalized standpoint of the social group as a whole to which he belongs" (Mead, 1959, p. 202). Markova defines dialogue as "the capacity of the mind to conceive, create and communicate about social relations in terms of Alter" (2003, p. 125). In this sense a "multiple personality" is a normal state of affairs as we have different relationships with different people. By uttering words we position ourselves in relation to others and ourselves (e.g. Harré 1998; Shotter, 1993; Hodge & Kress, 1988). The notion of "positioning" provides more flexibility than the concept of "role" because it allows one to move within a role, to experience multiple standpoints. In light of this idea we can understand speech as inherently social

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[35] See also Engeström (1999) for a discussion on this distinction.

…people's "inner" and "outer" activities originate in their feelings or their sense of how, semiotically, they are "positioned" in relation to the others around them...Such an approach…gives rise to a nonreferential, responsive view of speech and suggests that what we speak of our *selves* or as our *ideas*...are created as part of them; rather than the cause of what, say, they are the consequence.. (Shotter, 1993, p.11, italics in original)

4.2.1 The contra-positing of we/us – them/you as indicative of boundaries between the volunteer community and the company and users and developers

Mülhaüser & Harré's (1990) work on the psychological consequences of the use of pronominal systems for self-reference, has inspired me from the outset of this study. Personal pronouns have been shown to be powerful devices in constructing the socially rooted self as well as in expressing social relations (e.g. Chiang, 2009; Mulhauser & Harré, 1990; Inigo-Mora, 2004). Further, personal pronouns are also indicative of identity construction. Pronouns allow us the movement between approaching and distancing. Mulhauser & Harré's (1990) idea of "double indexicality" refers to a person's double positioning; "I" indexes not only a unitary self but also a social self, in which power relations are apparent. In this way the person acts as an anchor point: the speaker/writer is simultaneously a unique person as well as a member of a group (p. 132). The principal function of the directive use of "we" is to get others to perform an action that is in the speaker's (and his/her group's) own interest, whereas the function of the integrative use of "we" relates to the social bonding and solidarity aspects of interpersonal relations. In the first empirical chapter, a mailing list discussion episode leading to the demise of the OpenOffice.org sub project Groupware is analysed. The analysis of the mailing list interaction explores the boundaries of the Groupware community by analysing themes of discussions and the uses of plural pronouns in *contra positioning* the volunteers and Sun Microsystems as well as different groups of volunteers (see chapter 6).

4.2.2 Types of contributions and personal paths of participation as tools for analyzing changing motivation

The question of individual motivation is tied to the one's uniqueness and distinctiveness as a person in relation to others (Harré, 1998). Harré (1998) sees people as made up of know-how, skills and dispositions (p. 15). Building on Mead's (1959) concept of "self", Harré proposes that the singularity of the person, the self, should not be understood as a entity, but rather as a spatial-temporal location from within we look at the world and act in the world. In a

similar way, Dreier (1999) develops and elaborates a theory of the individual that is grounded in the conception of personal participation in structures of social practice. Subjects are not considered to be well bounded and autonomous but move around in and across social practices and simultaneously create indirect and direct links between these practices for themselves and other people. The concept of "personal life-conduct" refers to personal sense making (cf. Hakkarainen, 1990) and personal conflict management related to participating in these complex and diverse social arrangements where subjects have different and changing potentialities, concerns and modes of participation. "Life-trajectory" on the other hand is needed to understand how individual life-courses extend across social time and space (Dreier, 1999).

In my mind, Howard Gruber's (1980, p. 13) notion of "network of enterprises'" comes close to the idea of *multiple self* of the individual. The concept refers to any group of interrelated projects and activities, which the creative person is involved in. Enterprises are parallel, long, developing and durable. Gruber (1980, p. 13) identifies four meanings of a network of enterprises for the work of the creative person: 1) by constituting the person's organization of purpose, it defines the working self; 2) it provides a structure that organizes the work of the individual; 3) it allows the person to choose tasks for different moods and situations; and 4) it helps the creative person to define his/her uniqueness. The participatory trajectories of the individuals contributing are thus important when considering the evolution of the individual-in-community. In the second empirical chapter, in which volunteer motivation is examined, the intermediary concepts of *types of contributions* and *personal path of participation* are used as orienting tools, and they are directly based on the concepts of personal life-trajectory and network of enterprises. By analysing the positioning of the "I" in relation to others (people or technology), the changing motivations of volunteers' can be identified (see Chapter 7).

4.2.3 Dilemmatic discourses for analyzing public sector end-users' argumentation

The critical discourse approach utilized in the third empirical chapter focuses on the dilemmatic aspects of socially embedded discourses (Billig & al.1988; Fairclough, 1992) thus highlighting the competing rhetoric used in arguing for and against open source implementation on the level of speech/word meaning. The analysis attempts to clarify the way language is used in justifying public sector technical decision making, and to clarify how end-user organizations positions themselves in relation to the OpenOffice.org community and other open source projects.

The concept of *dilemmatic discourse* proposed here is a combination of the notion of ideological dilemmas by Billig & el. (1998) and the notion of discourse by Fairclough (1992). Discourse is understood here as a socially rooted distinct way of using language in the reproduction and challenging of hegemony (Fairclough, 1992; van Dijk, 1993). It both transforms and reproduces society–it is both a construction and a representation (Fairclough, 1992, p. 64). Thus, the viewpoints individuals express about open source draw on cultural (collective) discursive resources and simultaneously contribute to the construction of new discourses. Hence, the hegemonic struggle within and over discourse makes it possible to capture the rather abstract notions of power and ideology in motion. Billig et al. (1988), for example, argue that there is no such as thing as unitary discourse or ideology. Ideological dilemmas are a precondition of social life and without contradictory themes and conflicting values, no thinking and arguing would be possible. Hence, discourse is understood in this study as comprising contradictory and dilemmatic elements and it is seen as a constant source of struggle within both the individual self and between people.

Since discursive action can be restricted due to institutional positions such as professional expertise (van Dijk, 1993), understanding how open source is discursively represented and how these representations are related to issues of social power takes central stage. According to Fairclough (1992) ideologies embedded in discursive practices become most effective when they achieve the status of common sense. Thus, by looking at the use of explicit vocabulary (Fairclough 1992, p. 75; Billig et al. 1988, p. 22), and at the more indirectly observable, implicit and contradictory underlying values and assumptions contained within it (Billig et al. 1988, p. 23), different discourses indicating specific power relations can be identified. The societal implications of expressions like democracy, user freedom and transparency related to open source (see chapter 3.3) provide a lens and backdrop for analysing dilemmatic discourses in public sector argumentation (see chapter 8).

4.2.4 Changing community membership categories for understanding conceptual change

The OpenOffice.org Community Manager, lacking information or having too much of it, seeks to construct an audience based on what he already knows about the actual contributing volunteers, as well as imagining and constructing a desired group of people he wants to recruit and influence. These imaginings can be seen as managerial sense making, or what Shotter (1993) would call practical authoring. Therefore the manager's sense-making activity, or effort after meaning, is of central interest:

> [A good manager] "Clearly it is *not* to do with finding a true or false theory, but something to do with a complex of issues centered on the provision of an intelligible formulation of what has become, for others in the organization, a chaotic welter of impressions. (Shotter 1993, p. 148, italics in original)

The writer consciously offers his texts as something to be read and heard[36] by a partly known and party envisaged OpenOffice.org community. Hence, writing and written speech are seen as rhetorical action with the goal of persuading specific audiences (e.g. Ball, Farr & Hanson, 1989; Shotter, 1993; Skinner, 2006). In my study the "audience" constitutes people who are regarded as potential community members or who are persuaded to join the community. Hence, words are seen as practical acts, as tools for understanding and changing the world.

   Complementary intermediary concepts from various discourse and rhetorical theories (Cunliffe, 2001; Hodge & Kress, 1988; Mülhaüser & Harré, 1990; Park, 1982; Sacks, 1992; Shotter, 1993; Skinner, 2002, Tajfel, 1981) are used for gaining better understanding of the complex practice of what I choose to call *authoring community*. The two very close concepts of "social categories" (Tajfel, 1981) and "membership categorization device" (Sacks, 1992), as well as the Mülhaüser & Harré's (1990) work on the psychological consequences of the use of pronominal systems for self-reference (see section 4.2.1), are used to identify who is included in the community as a member. For example the use of "we" and "our" in product marketing is particularly important when the obvious connection between product and users is lacking (Mülhaüser & Harré, 1990, p. 173–175). "Conceptual change" introduced by Quentin Skinner (2002), on the other hand, directs attention to the politics of writing and helps understand the relation between changing language, rhetoric and society. It also helps to shed light on the persuasive intentions and the audience of the writer. For example, one of my data, the corpus of texts written by the Community Manager, comprises many rhetorical functions: selling, competing, marketing, informing, persuading, recruiting and justifying.

   The concept of "social category" developed by the social psychologist Henri Tajfel, is a useful tool for analysing discourse and rhetoric (see also Wetherell, 1996, p. 269), in this case specifying the different audiences invoked by the Community Manager. Social categories (like language in general) are both

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[36] In this study I omit consideration of the view that reading, as an active interpretative process, is an integral part of audience activity. However, since however, since I do not have access to the actual "readers", I have to confine her analysis to the writer.

already "there" while simultaneously "invented"–it is through social categories that we define ourselves and simultaneously redefine social categories:

> People are identified in society as members of social groups and these social categorizations refer not only to objective groupings but are socially and historically evolving. People internalize these social categorizations to define themselves subjectively. Thus these social groupings and the political, sociological and economic relationships between them have psychological aspects and consequences. (Turner, 1996, p. 17)[37]

A similar notion is the idea of "membership categorization device" (MCD) by sociologist Harvey Sacks (1992, p. 89), which also underlines the power of categories by emphasizing their inference-richness:

> When you get some category as an answer to a 'which'-type question, you can feel that you know a great deal about the person, and can readily formulate topics of conversation based on the knowledge stored in terms of that….[38]

In my analysis, however, I prefer the notion of *community membership categories* as it directs attention to the problem of a specific community. In identifying the manager's community categorization activity, the pronominal system as introduced earlier, is also of central importance. Pronouns too can be thought of as rhetorical, political and strategic tools.

Skinner (1989) has worked on the relation between the changing political world and the language used for appraising and describing it. A specific community can be understood through keywords/key concepts and corresponding vocabularies, e.g. a community membership category and the wording used to refer to it:

> The surest sign that a group or society has entered into the self-conscious possession of a new concept is that a corresponding vocabulary will be developed, a vocabulary which can be used to pick out and discuss the concept with consistency. (Skinner, 1989, p. 8)

Historicity and struggles are the keys to understanding conceptual histories, i.e. histories of words, where the political constitutes the linguistic and the linguis-

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[37] See also Turner (1996, p. 20); Tajfel (1979, p.66); Suchman (1994, pp. 181–182).

[38] The MCD is used here only as a heuristic tool and not in its conventional ethnomethodological sense as a method for analysing conversation and turn taking. The nature of the data does not allow for this. For other uses of MCD in the CHAT-tradition, see Rainio, 2009; Ylisassi, 2009).

tic constitutes the political (Ball et al., 1989, p. 33). Community membership categories are not static, but constantly shifting: they should be seen as a process. Conceptual change and the changing community membership categories can been seen as an integral part of the Community Manager's effort to make sense of the rapidly changing open source phenomenon and OpenOffice.org community as well as an effort to change this very object of sense-making. Focusing on conceptual change directs attention to the rhetorical power of language. The illocutionary intentions, that is, what the writer may have intended writing in a certain way is crucial to understanding the point of the text (Skinner, 2002, pp. 100–101). Utterances are not be seen as statements about the world as such, but as rhetorical moves–concepts and wordings should be considered in terms of their illocutionary force, as tools used for doing something with or as Skinner describes it, "weapons in ideological debate" (Skinner, 2002, p. 177). The ambiguity of concepts and words, and the strategic power associated with this ambiguity (Eisenberg, 1984), underlines the importance of carefully examining the multiple meanings and uses of the word "community", with a view to identifying community membership categories and the wordings related to these. Who is included in the "community", and who is being persuaded and recruited? (see chapter 9).

5 RESEARCH SITE, RESEARCH DESIGN AND ENTRANCE TO THE FIELD

In three empirical analyses (chapters 6, 7 and 9) the sites were part of the large hybrid open source project OpenOffice.org, launched by Sun Microsystems in 2000. One analysis (see chapter 8) is based on data drawn from four Finnish public sector organizations that either started to use open source-based tools or had at some point considered using them. Section 5.1 introduces the historical roots of the OpenOffice.org project and its official organization. Section 5.2 depicts the research design (see table 2) and the section 5.3 offers a more personal narrative on entering the field.

5.1 The OpenOffice.org project: historical roots and official organization

OpenOffice.org was born out of a strategic move by Sun Microsystems against Microsoft[39]. Sun Microsystems was one of the first to stand in opposition to Microsoft in 1998 when the firm was undergoing investigation for illegal bundling. Soon after, Sun acquired a German software company called "StarDivision" and wit it an office application called "StarOffice". A year later Sun Microsystems released the source code for its proprietary StarOffce to open source volunteers. The new open source version was named OpenOffice.org. The globally distributed OpenOffice.org project has both paid employees and volunteer contributors working together. The aim of the OpenOffice.org project is to develop a complete set of open source office end-user applications while the aim of its sponsor Sun Microsystems was to use the OpenOffice.org code base for developing its proprietary StarOffice productivity suite. Thus, as described in chapter 2, following the examples of Netscape's Mozilla project, the OpenOffice.org reflects a recent cultural line of development within the software industry: the emergence of hybrid open source projects that combine principles of proprietary in-house software development and open source in a single project.

Sun Microsystems acquired the German software company called StarDivision in 1999. A year later Sun released the code for its StarOffice Productivity suite to open source volunteer developers. Thus, Sun Microsystems' actions

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[39] Since the present data dates back to the period when Sun owned OpenOffice.org, it should be noted that Oracle purchased Sun Microsystems in 2009.

reflected a new shift in the Office software market: from the "monopoly" of expensive proprietary Office software products purchased only by those who can afford them, to a more heterogeneous market where end-users have the chance to co-develop and co-own affordable software. For the end-user (individual or company), who has had to pay licensing fees to companies like Microsoft, open source office software means having a choice and an alternative. But what were the reasons that led this major UNIX-vendor to take such an action?

Sun Microsystems was founded in 1982 propelled by the vision "The Network is the Computer" (Southwick 1999, p. 12, 57). Sun's vision of a networked future grew out a time and space where the foundations for the Internet and related networks were being set, where the famous UNIX operating system was being developed by people who referred to themselves as "hackers" (see chapter 2). At the time Sun Microsystems and Microsoft were not searching for shares in the same market. Sun was competing with hardware corporations such as Apollo, HP, IBM and Digital. Desktop computers, also referred to as low-end machines, came from Apple, Macintosh and Compaq (Southwick 1999). Office software and end-users as target consumers were not yet part of Sun's strategy. Sun Microsystems was described as an engineering-centric company, because most of its hardware products, its workstations and servers, were targeted at high-end users such as engineers, software developers and designers (Southwick 1999, p. 51). Sun's business model was an open systems approach, which meant that specifications were open but implementation remained closed. Thus, "open systems" did not mean "open Source".

According to Southwick (1999), Sun's strategy was to network every computer so that people could collaborate with each other. This was accomplished by using industry standard parts in building its machines, developing Berkeley UNIX to a higher level, and providing a GUI (Graphical Interface) to each user, (p. 27). A year before the release of the OpenOffice.org code Sun Microsystems announced it was acquiring the German Star Division Corporation, the original owner and developer of StarOffice, and releasing free (free of charge) web distribution of StarOffice 5.1. The fact that it had taken StarDivision over ten years to develop StarOffice meant that Sun had a firm code-base from which to continue development (Southwick 1999). The company also managed to get some of StarDivision's old-time developers to work on the new StarOffice suite. One interpretation of Sun Micosystems' motives might be that StarOffice was a missing element in its software portfolio. At the time, however, there was no expectation of direct revenue from StarOffice as it was free of charge for non-commercial use. An Office productivity suite like StarOffice, running on major platforms, including Sun Microsystem's own operating system Solaris, fostered hardware sales and helped customers migrate to its systems and solutions. Sun

Microsystems provided the infrastructure and resources for building a volunteer community around an existing product.

OpenOffice.org was born on October 13, 2000 when Sun Microsystems released the source code for its proprietary StarOffice productivity suite to the globally distributed open source developers. At the heart of this hybrid community was a dual-licensing strategy. OpenOffice.org used both Sun's commercial SISSL (Sun Industry Standards Source License) and the Open Source Initiative-certified free software license LGPL (Gnu Lesser General Public License). This licensing strategy enabled Sun to take the development version of the OpenOffice.org code and use it to build its proprietary StarOffice by adding certain closed" features. The issue of code-ownership materialized in the JCA (Joint Copyright Assignment). The code contributor was able to retain all the rights to her/his source code and related material, while Sun held the Copyright to the OpenOffice.org source code. The SISSL license basically allowed Sun to do what it wanted with the source base–modify it; extend it, etc.–as long as compatibility was maintained. The LGPL/GPL on the other hand guaranteed the OpenOffice.org contributor the right to his/her piece of code and related material.

A central version control tool for managing the OpenOffice.org code control was first "Subversion"[40] and later "OpenGrok'[41]. The code from each sub-project is incorporated into the OpenOffice.org main code base, which is then released as a new version (1.1, 1.1.2...2.0, etc.). Version by version, following the OpenOffice.org/StarOffice Roadmap, developers gradually improved the product by adding new features and enhancing old ones, freezing the code for debugging, and finally releasing a new version. What is here named "hybrid development path" illustrates the historical trajectory and relationship between the OpenOffice.org code base and Sun's commercial implementation, StarOffice (see (Figure 2).

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[40] http://wiki.services.openoffice.org/wiki/OOo_and_Subversion.

[41] "OpenGrok is a fast and usable source code search and cross reference engine. It helps you search, cross-reference and navigate your source tree. It can understand various program file formats and version control histories like Mercurial, Git, SCCS, RCS, CVS, Subversion, Teamware, ClearCase, Perforce, Monotone and Bazaar. In other words it lets you grok (profoundly understand) the open source, hence the name OpenGrok. It is written in Java."
(http://hub.opensolaris.org/bin/view/Project+opengrok/WebHome).
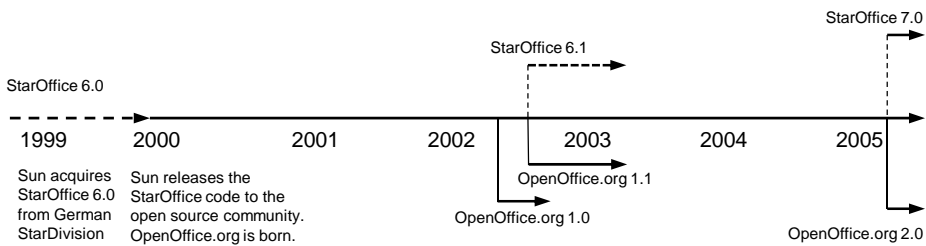
Figure 2. The OpenOffice.org/StarOffice hybrid development path between 1999 and 2005 constructed in 2005 by the author on the basis of information on the project's website (Freeman, 2005)

The OpenOffice.org "umbrella project" (see Figure 3) comprised 142 sub-projects[42] was divided within three different categories: Native Language Confederation (Native Lang), Accepted projects (Accepted), and Incubator test projects (Incubator). The Native Lang projects (100 projects) provide OpenOffice.org users with information and resources in their native language (other than English). Projects in the Accepted category (22 projects) are either core technical projects or user-information projects. The Incubator category (20 projects) provides testing ground for both technical and non-technical ideas. Each sub-project has one or two project owners/ co-leaders and a group of Sun Microsystems-employed developers and volunteers working together on a specific (technological) task or module. Many of the project-leaders had been moving between different projects and some might be leading more than one project at a time. Some of the leaders and Sun's developers had been involved from the start, as early as the 1980s when StarDivision owned StarOffice. Decision-making concerning module-specific code-contributions was made by the project owners/co-leaders. The "core team" at the time of the data collection was defined on the OpenOffice.org website as consisting of the Community Manager, who was responsible for day-to-day management, long-term growth, planning and community development, and two Sun-employed Release Managers who coordinated the development of OpenOffice.org and StarOffice via establishing release schedules. OpenOffice.org was governed via eight-member Community Council composed of five project leaders from the Accepted projects category, two from the Native Lang category, one community contributor representative, and one Sun Staff Member. The representatives from the Accepted and from the Native Lang categories were elected once a year by a consensus, whereas the community contributor representative served only for six months and was elected by popular vote from among two or three candidates chosen by the Community Manager and sub-project leaders from the three main

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[42] This was the situation in December 2010.

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project categories. However, the power relation was not a static 7–1 since some of the elected "community members" could have been and were Sun' s employees.

Established in September 2004, the OpenOffice.org Engineering Steering Committee (ESC) advised the Community Council on technical implementations in case of conflicting interests. However, the ultimate power lied with Community Council, which could overrule ESC's advice. All seven members appointed by the Community Council should have been be senior developers, who had actively contributed code patches/fixes for OpenOffice.org for over two years and who had contributed patches in more than one project.
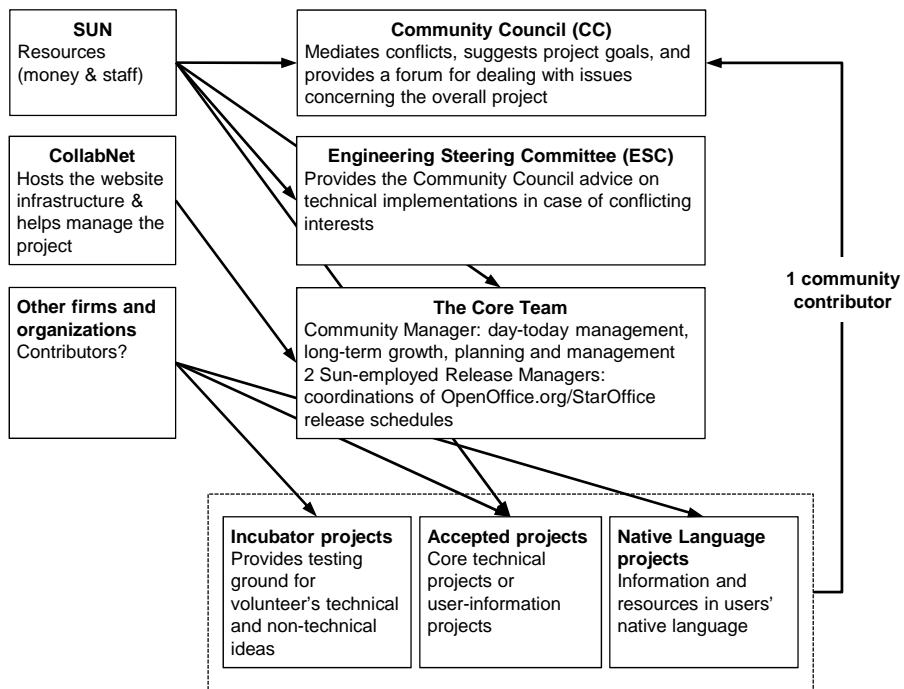
Figure 3. OpenOffice.org formal organization (Freeman, 2005, p. 9)[43]

Once a year the umbrella project OpenOffice.org organized a conference, the "OpenOffice.org conference" at which community members have the chance to meet face-to-face[44]. Each sub-project had a set of shared tools. These were the project's home page, the source code browser, announcements, membership list,

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[43] The chart was constructed by the author on the basis of the textual information provided on the project's website (http://about.openoffice.org/index.html#organization).

[44] I participated in the first conference held in Berlin in 2005, which is described in more detail in the next section.

an issue tracker, documents and files, and five mailing lists. The most important mailing list is the developers' mailing list, which is the public forum for developers for discussing development-related issues. All members have also access to the umbrella project's tools such as the SDK[45] via the OpenOffice.org home page, which also provides links to news, impending FOSS conferences, and various other writings. The home page changed considerably during 2000–2007 both in visual appearance and in content. One of the reasons has been to better meet the needs of newcomers with explicit instructions to guide them through the massive amount of information presented.

The name for the product developed by the OpenOffice.org project is also "OpenOffice.org". Its main applications are word processing, spreadsheets, graphics, presentations and databases. It is available for a number of different computer operating systems, is distributed as free software and is written using its own GUI toolkit. It supports the ISO/IEC standard OpenDocument Format (ODF) for data interchange as its default file format, as well as Microsoft Office formats among others. Currently OpenOffice.org supports over 120 languages. As free software, users are free to download, modify, use and distribute OpenOffice.org.

5.2 Research design

Table 2 summarizes the research design of my study. The first row indicates the viewpoint to "community" derived from the theories of communities discussed in section 4.1. They provide theoretical orientation to different but complementary dimensions of community. In the second row, the specific research questions introduced in section 2.3 are presented. They seek to answer the general research question concerning the nature and characteristics of "virtual" hybrid open source communities. In row three, the intermediary concepts adopted from discourse and rhetorical theories and introduced in section 4.2, are presented. They provide concrete tools for analysing the community dimensions derived from the community theories.

In row four, the four different research "sites" are presented: the OpenOffice.org Groupware project, the OpenOffice.org Lingucomponent project, four Finnish public sector organization's ICT departments and the OpenOffice.org project web pages. The data collected from each research site is summarized in row 5. The data comprised mailing list discussions, emails, thematic phone interviews, web page writings, thematic face-to-face interviews

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[45] Software Developer's Kit (http://download.openoffice.org/sdk/index.html).

and historical documents[46]. More detailed descriptions of the research sites, empirical data and methods of analyses are provided in the beginning of each empirical chapter.

Table 2. Research design: viewpoint to community, research questions, analytical tools, research sites and data

Viewpoint to "community"	Community from the point of volunteers	Individual volunteers' attachment to the community	End-users as extended community members	Community from the point of the Community Manager
Research Question	1. How is the OpenOffice.org 'community' constructed by volunteer contributors?	2. What motivates volunteers to contribute?	3. On what grounds end-user organizations make decision with regard to Open Source software?	4. How is the OpenOffice.org 'community' articulated by management?
Intermediary concepts	*We/us-them/they contra positioning* as indicative of boundary struggle between volunteers and the firm	*Types of contributions & Personal paths of participation* as tools for analyzing dynamic patterns of motivations	*Dilemmatic Discourses* as a way to identify the discursive struggles in technological decision making	*Authoring Community* as a heuristic tool for understanding the rhetorical and strategic nature of Office.org web page writings

Community Membership Categories for understanding the conceptual change of 'community' |
| **Research site** | OpenOffice.org Groupware project | OpenOffice.org Lingucomponent project | Four Finnish public sector organizations | The Open-Office.org website front page |
| **Data** | Mailing list discussions between a total of 138 emails | Mailing list discussions between 19.4 - 22.10 2005 total of 900 emails

7 Thematic phone interviews

7 follow-up email interviews | 9 thematic interviews, 4 subsequent focused email inquiries

Complementary historical documents:

Finnish IT magazines 'ITviikko' and 'Tietoviikko' between 2000 and 2005; an open source report produced by the city of Turku | 360 modifications to the front page tracked with the "wayback"-machine between 2000-2007

Community articles written by the OpenOffice.org Community Manager were chosen for closer analysis: ´81 separate editorials, ranging from 1 to 3 pages each, a total of 260 pages |

5.3 Entering the field

The choice of the four research sites, related sets of data and analytical tools are interlinked in the sense that the first opened up questions that I felt needed to be addressed in the second, and so forth. In the beginning the research process evolved in a similar way that an ethnographic non-participatory process would (Hine, 2008, p. 259). However, I did not analyse my auto-ethnographic reflective notes in any concise manner. They were used in the beginning as a way to articulate my observations and intuitive feelings of what might count as interesting to study. As Hine (2008, p. 259) points out, the travel to the field itself is virtual consisting of "experimental rather than physical displacement" (Hine, 2004, p. 245). Hence, reflections of experiences of entering the field are a "natural" part if virtual research.

Further, the enormity and scale of the OpenOffice.org "community" forced me to study it piecemeal. In this sense the sites could not be totally determined in advance but evolved as the open source phenomenon unfolded before me–the fast development of the open source phenomenon required moving beyond the already planned sites and research questions. I was also faced with the on-going problem of locating the site. Also the question why I am in this locale rather than another (Marcus, 1986, p. 172) was an on-going concern to me. My aim has been to address issues of validity and reliability throughout the writing process by giving enough empirical evidence to back up argumentation, and by explaining the choices made with respect to research sites, participants, data, analysis and interpretation (e.g Cohen & Manion, 2000).

Writing an email in hope of getting an answer from someone who has no obligation to respond can be extremely nerve-racking and slow the process of entering the field. Due to the lack of bodily and aural information, one may need to distance oneself from the emails. Interpreting the "tone" of informants' emails may also require using an "outsider", a colleague or friend to give their impression on the "feel" of the email, as I did in many cases. Researching techno scientific communities like open source communities may also involve learning to use open source technologies in order to better grasp the phenomenon and understand the community.

All I knew about OpenOffice.org in late 2003 was that it was an open source project initiated by a company, and that this new line of hybrid open source could be an interesting object of study. I had also started using Linux and OpenOffice.org products to gain better insight into the world of open source. However, I had no clue as to how large the OpenOffice.org project would actually turn out to be. At first glance it might seem obvious that the OpenOffice.org community's home would be at www.openoffice.org, which is the address that leads one to the project's "front door", to the home page. For an outsider like me

this indeed was the starting point. Easy, one might think, readily available data in English waiting to be used. Just sit at your computer and click away.

The home page opens up like any webpage, with structured information and hypertext links. The links lead to OpenOffice.org project-related information and "outside" OpenOffice.org website boundaries to different media sites, etc. Indeed, the web pages have changed a lot during the past 11 years and nowadays it is much easier to find relevant information. However, the volume of information on the web pages was cognitively overwhelming and arduous to digest. I got lost immediately. I did not know where the OpenOffice.org boundaries started and ended, and what information to follow. The meaning of it all just didn't seem to open up. This, I understand now, was partly that the whole phenomenon was new to me and research on the topic was minimal. Being so "close to the machine" also caused frequent headaches and moments of alienation from the "real" world. Does the community really exist? It was not until I got a better grasp of the project through my research that I started to dismiss the idea of a distinction between the "virtual" and the "real". Moreover, a lot has happened during the past seven years on the technology front and many of us are so immersed in Internet-enabled communities that it no longer seems odd to be "on" the Net. Furthermore, the combination of using a new operating system and new office software caused frustration and seemingly endless hours of problem solving. It was not infrequent for me to call for help by picking up the phone and calling my husband who is a software developer or some more advanced user-colleague.

I spent hours using Google to find answers to the problems I was facing. The university help desk did not at the time offer support for other systems than Windows and Mac. I continued learning about my new open source tools (Linux and OpenOffice.org), but after two years of trying, gave up. Linux was hard to maintain and seemed so much easier to use something that was officially supported by the IT staff. What came to OpenOffice.org text editor, it was much easier and worked fine with Windows, but it did not have a bibliographical reference system. Further, it was also easier to start as the Assistant Editor of Science Studies journal and do my copyediting work in Microsoft's Word text editor since this is still the most commonly used text editor. Some formatting etc. can actually change if saved in a different format, which complicates the process of copyediting. I was free to concentrate on my actual work.

My next step was to try to find someone who could help me find my way around. I wrote in my field notes on December 12, 2003: "This open source project must have a community somewhere, it can not only be about technology and textual information, can it?" By pure coincidence I found myself reading archived community articles written by the OpenOffice.org Community Manager. His name seemed to pop up in ways that made me think he must have a

significant role in the OpenOffice.org community. Despite the fact that I could have just accessed publicly available data, I felt that as a researcher I was morally obliged to introduce myself to the research site. On December 17, 2003, after a month of searching, I made my first social move.

I introduced myself as an end-user of the OpenOffice.org Office suit and articulated that I had been following the OpenOffice.org website for a while, just to make it clear that I had tried to do my home work, as it is customary for newcomers to digest community information before entering the discussion forums and participating in subprojects. Questions like "Have I really made myself clear?", "How does the message "sound"? "Did the message really get sent?", "How long should I wait if I do not get a reply?", inevitably crossed my mind.

I received a friendly message from the Community Manager. We exchanged some emails and I also conducted an Instant Messenger interview to gain some background information. Meanwhile I reflected on the nature of my research:

> It has been two weeks now since our last communication effort. Somehow this Internet-mediated communication makes it even more important to stay in contact. If one does not hear anything for a few days, one starts to think the contact is not there, that it never existed. (field notes 19.2.2004)

Eventually, after having discussed my plans with the OpenOffice.org Community Manager, I was kindly directed to study the volunteer-initiated Lingucomponent, Groupware and Bibliographic projects. The Community Manager however underlined that I need not have asked his permission. I joined both the Groupware and Lingucomponent projects' mailing lists as an "observer" and introduced myself to the projects' members. This way I was able not only to collect past archived messages but also follow the flow of emails as they came in in asynchrony-"real time". In this sense I "followed" the "community" for a lengthy period of time. I started observing all three projects and conducted interviews with Lingucomponent and Bibliographic volunteers. I soon learned that the themes and concerns of the Bibliographic project were very similar to those in the Lingucomponent and the Groupware project, and decided to explore other fields and issues. However, finding relevant volunteers to interview took time because it was hard to comprehend who was who on the mailing list. I exchanged altogether 105 emails with the Community Manger and 20 volunteers during 2004 and 2007. I found out that all the discussants on the projects' mailing lists were not necessarily community members, prompting the thought that a community like this surely poses new challenges in its management:

> …this kind of "aim and fire" ethnography (no systematic sampling)
> means that one has to take a risk when approaching a research prospect
> with e-mails ..it may turn out that the person you are contacting may not
> be an actual community member, which was not evident by looking at the
> content of the email…another thought is that such a hybrid project re-
> quires a new kind of management approach…in this sense OOo differs
> from Linux. (field notes, 28.6.2004)

Attending the annual OpenOffice.org conference was also part of gaining fami-
liarity with the community. The first one was held in Hamburg, Germany (20. –
21.3.2003). I attended the second one, which was held in Berlin, Germany (22.
–24.9.2004). Since I had already had an idea concerning the hybrid problems of
the Groupware project, I suggested that I present a paper that we (Freeman &
Siltala, 2004) had been writing on the subject matter of hybrid open source. The
idea however was not met with joy. My intention of intervening and actually
participating in the project ended abruptly:

> …the CM said that he would not encourage me to take up these problems
> of participation because they are already aware of them and trying to
> make things easier for newcomers…they would rather want to know who
> the volunteers are and why they participate…I replied that I am also in-
> terested in this matter… (field notes, 22.6.2004)

The conference experience was exhausting. I felt very much an outsider (totally
from a different planet), yet at times I managed to get into contact with the
Community Manager and some volunteers (none in the projects that I was
studying because in many cases it would have meant travelling long distances,
and some were not interested in the conference offerings). I conducted a few
interviews that I arranged ad hoc, and people were interested that I was interest-
ed in such a topic. The main insight of the conference was that effort was being
made to enhance community building and boost the community image. The
second insight, which I learned through embodied experience, was that I could
never become an "insider" and participant observer because I lacked the tech-
nical skills and technical curiosity:

> …In the Marketing session someone said that "the end-user would never
> know if s/he tripped in XML" and everyone, but I, laughed. I feel so alien
> that I feel sick. I'm experiencing symptoms such as perspiration, stomach
> aches and insecurity. Today I'm feeling as bad as yesterday. Luckily on
> train back to my motel in Berlin I have time to calm myself. I don't know
> whether this insecurity stems from me being in a new town. If only I

could talk to someone about my feelings. Why I am feeling so lousy when all the people I've met have been so kind to me? I have to go and find a gym somewhere so I can drain my emotions. (field notes, 23.9.2004)

Research notes were taken in the first phases of research. They helped me in entering the field and describe my early observations. It was a way of making sense of what was happening in the projects. The observations that I made on the mailing lists as they came in my inbox (I was subscribed to the mailing lists as an "observer") turned out fruitful for subsequent closer analysis.

During 2005–2006 I continued received (scarce) mailing list discussions in my inbox but did not really follow what was happening in the overall project. I conducted interviews with Lingucomponent volunteers in winter and spring 2005, and then a year later follow-up email interviews. Simultaneously I tracked member's participation paths in the Internet (outside OpenOffice.org). Then I concentrated in analysing the data collected from the Groupware and Lingucomponent and writing working papers (Freeman & Siltala, 2005; Siltala, Freeman & Miettinen, 2007) and an international article on volunteer motivation (Freeman, 2007).

In 2007, I felt the need to understand the local connections and implications of open source and to interact face-to-face with Finnish end-users. This "side step" from the OpenOffice.org project led me to collaborate with another researcher, Outi Grotenfelt from the Swedish School of Economics (Hanken), who had earlier conducted a questionnaire at both MJ and the FMI on open source usage for her PhD dissertation. This was important for two reasons. On one hand it provided me with a broader view of open source since I did not think that I had enough data from the OpenOffice.org projects, and on the other it had a "grounding effect" on me since I was able to interview people face to face and discuss data for the first time with another researcher.

We interviewed key-actors from four Finnish public sector organizations and their ICT decision making processes in choosing open source tools: the Ministry of Justice (MJ); the Finnish Meteorological Institute (FMI); the Ministry of Finance (MF) and the City of Turku. The "snowball sampling technique" (Goodman, 1961, pp. 148–170; see also Atkinson & Flint, 2001) was used in order to reach relevant social groups/actors likely to be involved in the infiltration of open source into the respective organizations. Altogether 9 thematic interviews[47], lasting from 1–1,5 hours were conducted during spring 2007. All

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[47] The open-ended questions were: Education and work history? How and where did the idea of FLOSS use come from? Who started to promote the idea and how was it grounded for the management? How was the use of FLOSS justified to the user? How did users react to FLOSS?

interviewees were sent the themes in advance so they could start reflecting on past events. Both researchers asked questions in a complementary manner: I focussed more on questions related to the social aspects of open source, while Grotenfelt centred on the technical aspects. The interviews constitute the main data source of this part of this study. Also additional data were used: the MJ's pilot reports and the Finnish OpenOffice.org user manual and OpenOffice.org questions and answers manual and eight steering group minutes of meetings; the MF's public administrative reports and four columns published by the MF's interviewee in the Finnish IT magazines "ITviikko" and "Tietoviikko" between 2000 and 2005 and a open source report produced by the city of Turku. The narratives of open source adoption given in the beginning of chapter 8 have been constructed from the interviews and related historical documents to provide a context for the subsequent analysis[48].

In translating the public sector data excerpts from Finnish to English, I have tried to be as faithful as possible to the spirit of the original. The analysis–the categorization of distinct sets of vocabularies into different discourses–was first done in Finnish. Then, the used excerpts and list of vocabularies indicating a distinct discourse were translated into English by me, who am bilingual, and checked by a professional native translator. I however acknowledge that word meaning may change slightly in translations, and hence may constitute a source of bias. The previous version of the analysis was read and commented by the MJ's system analyst. This kind of member checking can add reliability to the analysis (cf. Cohen & Manion, 2000, p. 109).

Both researchers have equal rights to use the collected data for their own purposes. Since Grotenfelt already knew people, it was easier to for us to negotiate time and space for conducting interviews with key actors in these two organizations. The interviewees at MJ and FMI asked us whether we were going to hear what other organizations like MF and the city of Turku had to say on the topical issue of open source since also these large organizations had contemplated using open source. Since Outi had also met these representatives earlier in open source gatherings, she was able to schedule us these interviews.

In 2009 I returned to OpenOffice.org. I focused on the changes to the project's front page because I still lacked some kind of an overall picture of the massive umbrella project. After an extensive gathering of modifications to the home page, I found myself studying the community articles written by the Community Manager, same pages that I had been reading in the beginning of

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How was the pilot-project organized? What kinds of tools have been developed for making the transition smoother? What kind of use-experiences has been obtained?

[48] See Appendix 3.

my search in 2003 but had forgotten about. In 2003 I did not realize how valuable this set of data would be. I ended up where I had begun.

6 HOW MUCH TIME SHOULD *WE* GIVE *THEM*: THE FAILURE OF THE OPENOFFICE.ORG GROUPWARE PROJECT

> The Groupware project also speaks to the community's desire and ability to take matters into its own hands. This is good. If earlier I speculated that the previous groupware thread indicated an uncertainty in OpenOffice.org's direction, I feel now that it rather suggests the real strength and engagement of the community. (In the first week we have had almost 40 posts. That's encouraging indeed.) For it demonstrates a community desire to move beyond the expressed features of OpenOffice.org code, and keep firmly within the structure of OpenOffice.org. Finally, as I write this, the discuss list related to the Groupware project is very much alive. (The Community Manager in 2003 on the project's webpage)

> Who is the community? (Groupware programmer-volunteer, 2004)

The first excerpt by the Community Manager in 2003 portrays the Groupware project as a lively discursive "community". The second excerpt, written by a volunteer programmer a year later, questions the existence and identity of the "community'". The discrepancy between these statements is interesting because the "espoused theory" of the Groupware community–words that we use to express what we do, or what we would like others to do (Argyris and Schon, 1974)–is questioned.

This chapter thus goes right into the hearth of hybrid open source. It examines the conditions of collaboration between the firm and the volunteers, and the related identity construction–how corporate and volunteers tackle their relationship, the "collaborative community" and how the ideals openness and transparency are enacted. Hence, the forthcoming analysis serves as a way into the problem of hybrid open source by examining how a group of volunteers in one sub-project of OpenOffice.org (Groupware) spoke about the community: about each other in relation to other volunteers and Sun Microsystem. Earlier research on the dynamics of hybrids has concentrated more or less on business models (e.g. Dahlander & Magnusson, 2005; Weber, 2005) leaving the social dynamics between the firm and volunteers unexplored. Hence, this analysis shows how the identity and ownership of the project, along with the openness of communication and decision-making processes is questioned throughout the discussion leading to the demise of the Groupware project. The findings high-

light the imbalance in the power-relation between volunteers and Sun Microsystem, and the failure of the collaboration between the firm and the volunteers.

The Groupware project (OooGW) was one of OpenOffice.org sub-projects. The project was introduced by Sun to the community at the OpenOffice.org conference in March 2003. The aim of the project was to develop an open source groupware application to be integrated into the OpenOffice.org suite. Groupware is software that is designed to allow a group of users on a network work simultaneously on a project. In order to provide different clients with communication services (such as e-mail), group document development, scheduling and tracking, a central server is needed. Documents can include text, images, or other types of data.

When I started observing the project in 2004, I was greeted by reticence. It seemed to me at the time that there was no "community". The level of participation in the late spring of 2004 on the Groupware mailing list was low. The issue that was being discussed on the mailing list was an end-user application, "Glow." It was supposed to cover such functionality as group calendaring, mail, instant messaging, shared folders, web whiteboard and peer-to-peer file exchange. It was the only technology that had been developed in the project so far. After the Glow-related discussion, there was a silent period, which lasted up to the beginning of July 2004.

> During my vacation 16.–31.7.04 a large number of new emails were posted to the Groupware … the situation in GW looks like this: community members are discussion the future of the project, they are concerned about the ownership and identity of the project: whether there is a community or not. (Field notes, 2.8. 2004)

The observed low level of communication made me think that the Groupware project was not attracting many members or newcomers. Three Sun-employed developers had contributed code to the CVS (Concurrent Version System) code base. The project leader contributed most of the code. However, the silence of the mailing list was broken at the beginning of July 2004 by an OpenOffice.org marketing project member inquiring about the status of Glow version 0.4. The Groupware project leader responded to this inquiry. He explained that Sun had re-organized the Glow team and transferred the code from the public CVS to Sun's internal repository because the pace of development had been too slow. He also stated that there was a possibility that Sun would open the source code of the next version of Glow to give Groupware volunteers another chance to work on it.

The inquiry activated 26 project members to post 130 messages to the project's mailing list between July 4, 2004 and February 3, 2005. These discus-

sions evolved from confusion and frustration to general suggestions to technical suggestions and then back to frustration and silence. Two complementary analyses on the same data were conducted. The first part of the analysis was a thematic one, and it provides a narrative of the events leading to the demise of the project. The second part is a microanalysis of the uses of plural pronouns in these discussions.

A two-stage analysis was conducted. The first stage of the analysis examined the themes of the discussions that emerged once the volunteers learned that "their" code had been taken away. The themes are presented by means of a narrative to highlight the nature of the mailing list discussion as a process (see sub-chapter 6.1). The second stage of the analysis explores the OpenOffice.org Groupware community boundaries: how boundaries became manifested between volunteers and Sun as well as between different groups of volunteers. Boundary construction is investigated by paying attention to the way plural pronouns are used in the discourse material (see chapter 6.2).

6.1 Discursive themes leading to the closing of the Glow code

In the first phase, from the flow of e-mails, 47 were chosen for further thematic analysis. The chosen messages were directly related to the problem of the groupware community and the openness of the decision-making process. The lengthy email threads, in which technical details concerning the future development were exchanged between mainly two to four volunteer programmers, were not included in the analysis of this study.

The analysis tells the story of the discussion leading to the demise of the Groupware project through the categorization of the data into argumentative themes. However, it should be noted that one e-mail message could contain multiple arguments. After many interpretative rounds, three distinct thematic categories or themes emerged from the data: 1) identity and ownership of the project, 2) interpretations of the reasons that led the closing of the code and 3) suggestions related to the future of the Groupware project. The categories with examples from the data are presented (see Table 3).

Table 3. Thematic categories related to the closing of the Glow code on the Groupware project's mailing lists (4.7.2004–3.2.2005)

Thematic Categories and Arguments	Number and Position of Speakers	Examples of arguments
1. Identity and ownership of the project		
1a Groupware is Sun's project, not a community project (5 utterances)	5 Volunteers	"OOoGW is clearly not a community project, it's completely controlled by Sun, that is, what happens in OOoGW is _only_ decided by Sun." (Volunteer 6, programmer)
1b Groupware is a community-project (3 utterances)	2 Volunteers and 1 Sun-employed developer	"But you guys *are* the community...- it's your call. Whatever you do, I'll try to pitch in with some of my none too copious spare time." (Sun-employed ex-lead)
2. Interpretations of the reasons that led to the closing of the code		
2a There are not enough volunteer programmers in the Groupware project (15 utterances)	8 Volunteers and 1 Sun-employed developer	"The chance for any OOoGW (OpenOffice.org Groupware) application to become a successor of ...comparable well-known mail and calendaring client has definitely gone. :-(And: This is NOT because of SUNs development, but because of the low engagement of community developers!" (Volunteer 8)
2b There is a lot of talk but no code in the Groupware project (7 utterances)	3 Volunteers and 1 Sun-employed developer	"OOGW is nothing more than a lot of visions and ideas and a half application named Glow." (Volunteer 9)
3. Suggestions related to the future of the Groupware project		
3a Groupware members should wait for Sun to decide whether to release the new Glow code as open source (11 utterances)	6 Volunteers, 1 Sun-employed developer and 1 CollabNet-employed Community Manager	"Seems to be the most realistic option (to wait)." (Volunteer 7)
3b Start a new project based on the older version of Glow (6 utterances)		
	5 volunteer developers 1 Sun-employed developer	"One wonders why nobody has been doing it (...Start/continue hacking on Glow 0.2b ...) so far." (Sun-employed programmer)

After the volunteer-initiated inquiry described earlier, a similar scout was sent (presumably via a private e-mail) directly to the Sun-employed lead. He responded by sending a public e-mail to the mailing list:

> We re-orged and expanded the Glow team here at Sun. I'm no longer directly involved in the Glow project...The new Glow team are pretty focused on coding on Glow and meeting some tough deadlines; the all-new code is in an internal code workspace which is why you aren't seeing much activity on the groupware lists or in CVS. I'm doing what I can do to motivate our management folks to let the second generation Glow code out where you can use it and contribute to it, but the team ***must*** make those deadlines. I hope you'll hear from the team real soon but I can't predict accurately just when that will be. Stay tuned! (Sun developer, bold in original)

The frustration experienced by the project members after they were informed that the Glow source code was no longer publicly available, is expressed in the following excerpt:

> From a personal standpoint, I have to ask myself: OK, so why bother helping test this thing, if any of the feedback I put in goes into a behind closed doors development workspace just because Sun has to meet deadlines?" (Volunteer 2, tester)

For this volunteer it seemed that the most important reason for contributing had been taken away with the source code. This volunteer was a potential end-user and tester, not a programmer.

The project members' opinions concerning the identity and ownership of the project, which are presented in Table 3, supply other possible explanations for the closure of the code:

> OOoGW is clearly not a community project, it's completely controlled by Sun, that is, what happens in OOoGW is _only_ decided by Sun. (Volunteer 6, programmer)

> OOoGW is not exclusively Glow. The intent was to have an open community driven project. ...I consider anyone participating in any fashion, major or minor a member of the community. Constructive ideas are always welcome, and will be presented here openly. (Volunteer 12, co-lead)

These comments pose the question about who constituted the Groupware "community": Sun's developers, volunteers or both? (See categories 1a and 1b in Table 3.) Sun's goal was to establish a volunteer Groupware community with a variety of heterogeneous expertise. However, most of the programming had been done by the Sun-employed project lead, which indicated that there were not enough volunteer programmers (see 2a and 2b). The volunteers talking on the mailing list said that they wanted to contribute by testing, fixing bugs, writing documentation and manuals and translating. However, they could not fully use their skills before there was some working code to test and criticize. Thus, the Groupware community consisted of one Sun developer representative and volunteer users, all anxious to get a Groupware solution for their respective firms and organizations. The productive core of the community was missing (see 2a and 2b). The importance of a "substantial core" (Weber 2004, p. 271), or the existence of available, runnable code (Raymond, 1999) can be seen as a prerequisite for successful FOSS development. Not having enough volunteer programmers (see 2b) meant no volunteer-developed open source code. Having no "openly" developed code implied that Sun was not getting anything in return for its investment. Having the new version of Glow ready in time was a priority for Sun. Thus, the code had to be developed in-house by Sun's developers.

What options did the user-volunteers have? In theme 3, three suggestions were found. These were: waiting (3a), forking (3b) and closing (3c). Volunteers presented several suggestions related to the future of the project, but without programmers, nothing more than waiting could be done. The only thing the volunteer "community" (which at the time comprised four discussants) could have done autonomously, would have been to fork the Glow project, that is, take an earlier Glow version and start developing it in a new project:

> The available Glow 0.3 sources are licensed under LGPL (and SISSL), this can't be revoked. So if the community decides to continue work on this base, it can do so! This is the great thing about free software. (Volunteer 6, programmer)

However, in reality, there was nothing more they could actually to do but to wait and see if Sun would release the new Glow code as open source.

> It (the project) seems to be pretty much dead. In the death throw stage where occasionally someone will try to light a fire only to be dowsed by a bucket of "Why don't we just use ____?" Occasionally, someone from Sun will pop in and make a comment about something that's "going to be released" sometime. (Volunteer 10, user 3.1.2005)

The volunteer co-lead suggested: *"Let's see what Sun offers..."*. Ironically, the option of closing the project (3c)–a suggestion that did not receive any support from the volunteers–turned out to be the future of Groupware. The closure of the new Glow 0.4 would not have been possible without the OpenOffice.org dual-licensing strategy. At the time Sun Microsystems used both its' own license SISSL (Sun Industry Standard Source License) and the free software license LGPL (GNU Lesser General Public License) in implementing its proprietary StarOffice suite. In 2005 Sun Microsystems gave up the SISSL and used only LGPL, allowing it to utilize OpenOffice.org code. The ownership of the OpenOffice.org code materializes in the Joint Copyright Assignment (JCA). According to the agreement, Sun owned the OpenOffice.org/StarOffice code as a whole, and each volunteer contributor owned the piece of code they had contributed. Thus, both parties, Sun and the volunteer community, could take the OpenOffice.org code licensed under the LGPL, and develop it separately from OpenOffice.org if they chose to. Sun was able to close the code since it had the manpower (employee-programmers) needed to work on the missing pieces of the Glow. As a result, the new Sun-developed Glow could be incorporated into the next version of the proprietary StarOffice suite.

6.2 Uses of plural pronouns in contra-positioning volunteers and Sun, users and developers

As the above thematic analysis showed, the closing of the code seemed to make visible the two opposing camps: the volunteers and Sun. However, in order to fully explore the discursive construction of boundaries, an additional analysis was conducted. This second stage of the analysis focuses on the use of plural pronouns in making distinctions between different groups of people on the mailing list. All 138 emails were analysed, including the lengthy one-on-one technical discussions between a few volunteer programmers. In order to understand the discursive construction of boundaries, the analysis was targeted at the different uses and meanings of the personal pronouns "we", "us", "our", "them", "they", "their", and "you'", as these manifest social relations (e.g., Mülhaüser & Harré, 1990; Austin, 1962). These pronouns were used throughout the discussions in what I shall call the contra-positioning of Sun and the volunteers, as well as between different groups of volunteers, i.e., users and developers. All instances of plural pronoun use were identified and categorized on the basis of their frame of reference (see Table 4).

Table 4. The contra positioning of the corporate player and the volunteers: meanings given to plural personal pronouns, plural pronoun frequency and data examples

Uses of plural personal pronouns (136)	Meanings given by Sun's developer (11)	Meanings given by Community Manager (3)	Meanings given by volunteer contributors (127)
We (83)	Sun (3)	I + volunteers (3) *… we need to come to a decision of where to go, at least in the near future. One option is to wait until December, to see if Glow is open…"*	Volunteers on the mailing list (54) *"we should try to get in contact with some of the core developers to find out, how groupware functions can be integrated in the OOo core applications"* Volunteer programmers (24) *"Anyway, the rest of the list must be rather annoyed by now. We could obviously be arguing back and forth for the rest of eternity …I hope that you'll return off-list so that we can look at what we can practically do about the "option b"* Volunteer's institution or company (5) *"I'm curious because we are starting to evaluate and calendaring functionality is high on the list of needed features."*
Us (5)	-------	--------	Volunteers on the mailing list (5) *"They way X is giving us information makes me think that Glow2 (just to make a difference to the existing Open Source Code) won't be Open Source."*
Our (9)	Sun's (1)	--------	Volunteers on the mailing list (8) *…It was a great thing, SUN seemed to supported our goals…"*
You, Your (15)	Volunteers on the mailing list (5) *"find ways to make it more useful to you and your colleagues, and add a public contribution to a major open-source project to your resume.."*	---------	Other volunteers on the mailing list (5) *"its not your task to decide how Sun invests its resources."* - defending Sun. Sun (5) *""this isn't exactly my idea of a "community effort" - what about all those (few I'll grant you, but nonetheless) worthy volunteers who wanted to contribute to the code by supplying patches or increments and who now probably feel left out in the cold."*
Them, they, their (24)	Sun's Glow team, (3)	---------	Sun (21) *"…the current Glow team could radically change their architecture thoughts"*

Altogether 136 plural pronouns were found in the messages: "we" was used 83 times, "us" 5 times, "our" 9 times, "you/your" 15 times, "them/they or their" 24 times. Most of the instances of plural pronoun use were found in the emails sent by the volunteers since they were the majority of the discussants on the list (out the 136 instances of plural pronoun use, 127 were produced by volunteers). To them "we" meant three different things. The first and most used meaning was "we, the volunteers on the mailing list" or "volunteer community" as opposed to "Sun'", "Sun's Glow team", "Sun group", "the current Glow team", "the core group" and "core developers". The second use of "we" was interestingly "we the volunteer programmers" as opposed to "other volunteers on the list", namely users. It is noteworthy that this new momentarily "we" appeared in the long technical conversations between few volunteer programmers. It seems to exhibit a "we" separate from the "user-contributors" thus displaying a boundary between the volunteer coders and volunteer users:

> I guess the others in the list are already annoyed by the conversion, please let us know if we should go offlist! Not sure whether this is of general interest. (Volunteer programmer)

This new "we" (as we can see in the excerpt in table 3), decided to go off-line and continue their discussions in private. The volunteer community seemed to split in to two. The third meaning of "we" by the volunteers was used to designate "we in my company". Many of the user-contributors were in fact evaluating Glow for their company's use. Hence, "we" was used in constructing three kinds of boundaries: between volunteers and Sun, between volunteer programmers and volunteers users and between a single volunteer representing his firm and all the others.

"Us" and "our" were also used in referring to volunteers themselves as opposed to Sun. "You" and "your" were used on the one hand for designating volunteers and on the other for referring to Sun's developer as a representative of Sun's actions. Interestingly, Sun's developer, who occasionally popped by to discuss matters, wanted to differentiate himself from "the Glow team", which was to him "them", "they", "their". However, he also used "we" to designate "Sun". For the volunteers, all 21 uses of "them", "they", "their" referred solely to "Sun". In addition to the using plural pronouns as boundary markers, the volunteers juxtaposed "Sun" and "community" 11 times. The Community manager used integrative "we" once in encouraging the Groupware volunteers to come to some conclusion about the future of the project. He mainly avoided using plural pronouns, possibly as a sign of not wanting to take sides. Instead, he tended to use the passive cut out the agentive, which can be interpreted as not

wanting to take "sides" in the matter of closing the code. Hence, besides seeing contra positioning of plurals, we see the use and non-use of plural pronouns.

6.3 Conclusions

This chapter examined volunteers' understanding of the hybrid "community" once the co-owned source code "Glow" was taken away by the company. The Groupware case shows how difficult it was for Sun to form a community of volunteer programmer-developers around the "Glow" code. The volunteer idea-generating users and a few potential volunteer developers were left waiting for working code without which collaboration was not possible. The volunteer idea-generating users and a few programmer-developers on the mailing list were left "out in the cold" thus questioning the openness of the hybrid project and its decision making processes, and highlighting the changing concept of the user.

The thematic analysis of the discussion on the Groupware project shows that the Groupware user-volunteers and the firm failed in collaborating and develop-ing the Groupware application jointly. Sun Microsystems owned a piece of proprietary software and later opened its source code to give rise to a new open development community. However, no volunteer programmer community was formed to implement any working code to realize the program. This analysis showed the difficulty of creating a community around an idea of software that does not catch the interest of enough voluntary programmers. Groupware seemed important to the (end)-users, but not so much to the programmers. Sun's developer(s), even when it was open and available, were the main code contri-butors. Consequently Sun ended up closing the source code for the program and developing it in-house. The closure of the source code gradually led to the closure of the project. Groupware volunteers were left without a product and the OpenOffice.org product was left without a Groupware solution. In this sense, the firm's attempt to make use of the open development model, and the volun-teers' attempt to benefit by getting a Groupware solution–the ideal of the "sym-biotic relation" (Dahlander & Magnusson, 2005), failed. Further, the ideals of openness and transparency of communication and decision-making processes were compromised by the firm.

The analysis highlights that the very notion of a user is becoming more com-plicated with the emergence of hybrid projects. OpenOffice.org has millions of users, but the core developers are largely professionals employed by Sun. The users of OpenOffice.org are predominantly end-users not capable of or interest-ed in programming. The fate of the OpenOffice.org Groupware demonstrated the problem in this separation. The volunteer members of the project were end-users willing to test and criticize prototypes and beta versions of the program, which would bring quality assurance to any code produced. The volunteer users

of the project could be called idea-generating users, whose contribution to the project was discursive in nature.

This chapter also examined the emergence of a discursively constructed boundary between Groupware volunteers and Sun Microsystems. The second complementary microanalysis of the Groupware discussions showed how plural pronouns were used as boundary markers in the discursive construction of the OpenOffice.org Groupware hybrid community (see Figure 4). Not once did the volunteers use "we" in identifying with "Sun Microsystems". This contra-positioning between "volunteer" and the "corporate sponsor and core developer" implies that for the volunteers, "community" meant "volunteers on the mailing list", not the hybrid endeavour. Indeed, this finding is in line with the notion that hybrids are not harmonious united entities (Weber, 2004; O'Mahony & Ferraro, 2007). Moreover, these different forms will continue to co-exist and thus have to find ways in which to relate to each other (Weber, 2004, p. 263). Cultural clashes (Dahlander & Magnusson, 2005) like the one evidenced here are inevitable when the partners are not equal. The managerial challenge of hybrid open source lies precisely in this dilemmatic relation. However, the analysis also showed how a new boundary was constructed momentarily between volunteer users and volunteers programmers, a boundary based on different perceptions of skills, expertise and motives. This has not been reported in previous research on open source.

Moreover, the analysis showed the fragmentation of the Groupware "community" into different groups. Four boundaries emerged in the discussion: 1) a strong discursive boundary between volunteers and the company, indicating that in the present case there was no shared sense of "community" between volunteers and the company 2) a momentary boundary between the volunteer users and volunteer developers, indicating that even the volunteer "community" was not united 3) a boundary between Sun's developer and Sun's "Glow", indicating the awkward position of the Sun's representative in responding to angry frustrated volunteers by distancing himself from Sun's actions and 4) through the Community Manager's avoidance of the use of personal and plural pronouns, an ambiguous boundary between the Community Manager, the volunteers and Sun, indicating the difficult mediating position of the Community Manager.

Both analyses show the complex relation between the object of production, the community and discourse. When the Glow code was taken away, the volunteers engaged in heated debate over the nature of the project–whether it was a real open source community project or not. The discourse continued for as long as there was even minimal hope of getting it back. However, once it was clear that Sun was not going to re-open it, the debate came to an end.
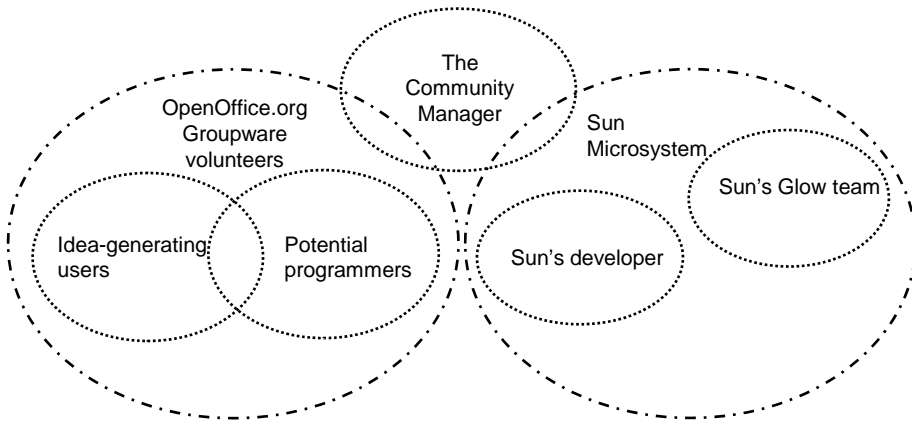
Figure 4. Boundaries that became visible through the analysis of uses of plural pro-
nouns on the Groupware mailing list

The discursive construction of boundaries showed that the "hybrid community"
was negotiated and recreated. The struggle over the meaning of identity and
ownership was clearly visible in the volunteers' speech.

Although the hijacking of the Glow code by its co-owner and sole developer,
Sun, eventually led to the fading away of the volunteer project, this did not
happen immediately. Using the CHAT vocabulary, one could say that discourse
was the key to understanding the relation between the missing object and the
community. It was not until a volunteer inquired about the status of the project
that the missing object became visible. The ensuing discourse made visible the
hidden object and the boundaries between "we" the volunteers and '"them", the
company/Sun's Glow team. However, it also shows how the volunteer commu-
nity was able to exist for a while even without the shared object source code.

Adler & Heckscher (2006) defined the basis of trust in "collaborative com-
munity" as honesty, contribution, concern, and collegiality. Based on the insuf-
ficient faith shown in the Groupware project, it can be concluded that the "hybr-
id Groupware community" failed in all four areas. The company was the code
contributor, but the idea-generating users' discursive contributions were nulli-
fied since no volunteer code was developed to accompany them. The basis of
trust was compromised and the hybrid community split into two. Although the
faith of the Groupware project does not characterize the whole OpenOffice.org
project, it offers a viewpoint to the clash between corporate culture and the
ideals of "openness" and "transparency" inherent in open source.

7 MOTIVATION IN MOVEMENT: VOLUNTEER PARTICIPATION AND CONTRIBUTION

This chapter deepens the understanding of the hybrid OpenOffice.org community by examining the division of labour of contributors and tracing the paths of participation of individual contributors in a different sub-project. It explores the varieties of motivations and the nature of code construction and user activity in the OpenOffice.org Lingucomponent project, which develops open source language writing aids[49]. The types of contributions and personal path of participation presented in chapter 4 were used as analytical tools for analysing changing individual motivations to participate in collective activity. These tools allowed me to ask who the volunteers are and what motivates them to contribute.

A volunteer programmer, the project's main leader, established the Lingucomponent project in June 2001. The purpose of the volunteer-initiated Lingucomponent is to develop and provide open source writing aids such as spell checking, hyphenation and thesauruses in different languages for (end) users of the OpenOffice.org. The sub project is an important vehicle for the diffusion of OpenOffice.org to different countries and languages. It could be characterized as the "cross-roads" of the larger OpenOffice.org project as many of its contributors also belong to OpenOffice.org Native Language projects. I began observing the Lingucomponent project's developers' mailing list in May 2004 after an extensive four-month period of getting to know the OpenOffice.org umbrella project and establishing a personal network of contacts.

The default spell-checking engine used in the project was "MySpell" created by the leader on the basis of Ispell code. These Ispell-based engines support most Western languages, but they could not be used for languages with a rich morphological structure (e.g Hungarian, Estonian, Finnish). Hence, a new engine called "HunSpell" replaced the Myspell. The author of Hunspell became the main leader in 2005. There is also a co-leader, who provides general information, makes dictionaries available on the website, and forwards emails. The leaders were the only contributors with explicit, more readily identifiable roles.

It was difficult to conceive who the majority of the people on the mailing list were related to the project. There was a lot of talk but not many code contributors to the main code base. The project leader(s) were the only ones contributing code to the repository. For many participants participation was sporadic in

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[49] With the permission of the Science Studies journal, the analysis presented here is identical to the one published in Science Studies (Freeman, 2007).

nature: when a special topic came up, those interested jumped in, gave their discursive contribution and left. Gradually I understood that my initial "gut feeling" of the project as an unorganized one was not just ignorance about language technology, but something that the interviewed volunteers themselves had also experienced:

> ...So it's like nobody really knows who is working on what… (Interview with a volunteer, 10.2 2005)

The first phase of managing the data was a categorizing one. Altogether 918 emails sent by 131 people to the Lingucomponent mailing list during the period from April 19 until October 22 2005 were analysed. The reason for including all the participants (during the 1,5 year period) in the analysis was that it turned out to be impossible just by looking at the number of sent emails or the code repository to determine whose contribution was important and whose not. Moreover, understanding the content of someone's message required reading the whole thread of messages and related others, and finding additional information via Google (personal webpage etc.) Including all participants and all emails in the initial analysis also increases its validity. Doing qualitative analysis on a large amount of data like this is laborious, as it requires handcrafting the sample.

The second phase of the analysis was more focused, and it was based on semi-constructed thematic phone interviews and follow-up email interviews a year later. I conducted 10 thematic interviews early in 2005 with Lingucomponent leaders and with some people who were active on the mailing list and responsive to my interview inquiry. Seven interviews were done by phone, and three by email due to language difficulties. Four did not respond to my inquiries. The Interviews were transcribed by a bilingual Finnish-English speaker like myself, and double-checked by me.

I used the first interviews to construct a document with a participation timeline, background information and possible reasons for participating. I sent the personal participation documents to each interviewee and asked them to modify, erase or add to my text if needed. I also asked them to write about their current and future situation. The document acted as a kind of interactive and dynamic artefact and enabled "member checking" (Cohen & Manion, 2000, p. 109). From these interviews I chose all six-tool providers' interviews, and in dialogue with them, constructed their personal paths of participation. I analysed all speech related to educational history and involvement with open source and OpenOffice.org/Lingucomponent with the aim of identifying important events and related motives.

I started my analysis by tracking the subject's discussions. I organized the mailing list discussions in alphabetical order by author and began identifying

types of contributions on the basis of the content and purpose of the email. The length of emails ranged from one page to one short paragraph. Some emails referred to more than one purpose, which meant that some people were engaged in more than one discussion, i.e., type of contribution. Simultaneously, I identified different groups of people according to their main contribution. As a result, a group of forty-one people making tool-related announcements was found. I named this group "tool providers" and focused my analysis on their contributions because they seemed central to the project. I categorized the tools offered in relation to the OpenOffice.org suite, and also identified the contributors' educational and institutional backgrounds to better understand the context of tool development. The contributions categories were not predetermined or fixed, but emerged from the contributors' own speech in the emails and evolved during participation as exemplified in the following phase of the analysis.

The second phase of the analysis focused on the tool providers' personal paths of participation. All speech related to their educational history and involvement with open source, and their entry to OpenOffice.org/Lingu-component, were analysed with the aim of identifying important events and related motives. The focus was on how the self was positioned in relation to technological objects and other important people in their respective lives.

7.1 Contributions of the tool providers for OpenOffice.org Lingucomponent project

The types of contributions to the Lingucomponent project are presented in Table 5.

Table 5. Types of contributions in the Lingucomponent mailing list

Contribution on the mailing list	Email example (original)	Number of people contri-buting
1. Technical discussions related to Dictionaries & Spell checkers; Thesaurus; and Grammar Checkers	"I did not write patgen or the alt linux hyphenation code (which is based on patgen) but AFAIK, the dot anchors the pattern to either the start of the word or the end of the word. so .blah means the pattern only matches blah at the beginning of a word…"	25
2. Linguistic discussions related to Dictionaries & Spell checkers; Hyphenation; and Thesaurus	"…affixes are an artificial construct, and what matter really are cases. The affixes don't actually reflect the grammar and don't give any real insights. The case systems – and grammar to an extent – varies even between Estonian and Finnish (that are related languages). I also used very much only examples where no mutation – especialy mutation of the root – happens as such would reduce the scope of what can be compressed."	16
3. Tool Announcements	"…I have written a java program that takes a textual description of suffiix variations of a language (like english, portugues, spanish, italian, french) and generates a java class that that contains a method to perform a lexical analysis of any given word to generate possible root words to be looked up in a dictionary. I suppose this could be adapted to generate c++ classes or c functions."	31
4. Job-offers & Offers of Co-operation	"What we seek…1) Find OpenOffice.org developers that could mentor us throughout our development process. 2) Attract interested Estonian, Finnish or Hungarian developers to join our team.3) Increase our awareness of similar projects for unrelated languages that could contribute some code fragments to get us started."	10
5. Contribution "applications " /expressing interest in contributing	"Hello Mr. (project lead) I am interested in joining your development team to Redesign the spell checker. How can I get started?"	43
6. Other (voting, requests for help and features, expressions of support, forwarding e-mails, occasional responses)	-------	38

Messages were related to technical or linguistic issues. Contributing to technical discussions required programming skills and some knowledge of the OpenOf-

fice.org architecture (see category 1). Likewise, contributors to linguistic discussions required either linguistic skills/profession or a good deal of knowledge with respect to their language (see category 2). However, some programmers also engaged in these discussions because they knew what was technically possible with the available tools. The tools announced on the mailing list indicate that many contributors want to share their work on the list, but do not necessarily contribute directly to OpenOffice.org code base (category 3). The job-offers and co-operation offers imply that the mailing list is used as a forum for recruiting people. Forty-three introductions or "applications" from newcomers were sent to the list, but no responses were found. It is quite astonishing that no one was willing to help or socialize newcomers in getting in the project. The last group of messages comprised general procedures such as voting, forwarding or redirecting messages, expressing support and occasional answers to a few end-user questions (category 6).

Parallel to the above categorization, I was able to find different types of contributors on the basis of the contributor's main contribution. These were:

1. Forty-one tool providers who were connected to the project via a) Lingucomponent leadership, b) Native Language projects, c) other OpenOffice.org–independent projects;
2. twenty-eight Native Language leaders and other contributors;
3. forty-four newcomers, comprising a) eight applicants with no explicit idea regarding their contribution, b) twenty-eight task-oriented applicants, and c) eight Google's summer of code applicants;
4. five expressers of support and appreciation;
5. two end-users asking for help in questions concerning the use of OpenOffice.org;
6. five end-users making requests for features concerning OpenOffice.org;
7. three occasional suppliers of answers; and
8. five Sun representatives, contributions unknown.

The tool providers were chosen for further analysis. They usually announced they had developed/are developing a tool or are engaged in another project, which develops a tool that might be of use to others on the list. Very often these were tools that cannot be integrated into the main OpenOffice.org because of licensing issues, minority language issues or OpenOffice.org architectural issues. Many tool providers also engaged in discussions specific to their respective (minority) language and related technical-linguistic discussions. Tool providers' purposes for using the project's mailing list could be characterized as putting one's work on display for potential collective use and further development, as conveying one's skills and capabilities, and as a tool for hooking up

with the right people. Hence, the mailing list is used as a forum for publication, discussion, and recruitment and future collaboration (see Figure 5).
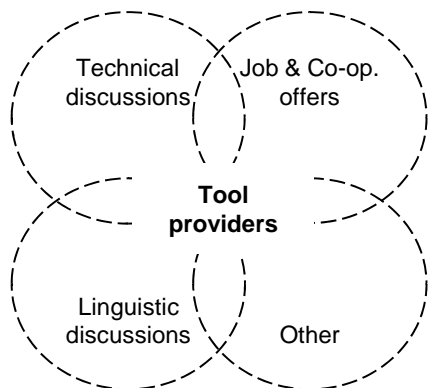
Figure 5. Tool providers' engagement in other discussions

What kinds of tools were announced on the mailing list and how were they related to OpenOffice.org? I found two types of tools on offer: plug-in tools for end-user use and independent tools for end-user and contributor use. Plug-in tools can be installed straight from the OpenOffice.org file (wizard) and tools menu, while independent tools have to be downloaded from their respective sites. About half of the tools were plug-in tools, while the others were independent tools.

Twenty-four contributed **spell-checking dictionaries** based on Myspell, which is the default OpenOffice.org engine for building dictionaries. A spell checker engine incorporated into the OpenOffice.org core code makes it possible for non-programmers to participate in the development of linguistic features for OpenOffice.org. Using Myspell to create dictionaries does not require programming skills, rather good knowledge of the language in question and Myspell rules. These spell-checking dictionaries are text files. Four dictionaries were not based on Myspell due to licensing issues or language specific issues (morphological structure etc.). Most dictionaries are available for download on the project's homepage, and can be plugged in by the user. In addition to the default engine Myspell, there are two other engines produced by two different programmers-contributors that can be used for dictionary creation.

The rest of the contributed tools were mostly independent of OpenOffice.org technical core due to licensing issues, OpenOffice.org architectural issues or minority language issues (e.g. morphological structure). Thesaurus, hyphenation dictionaries as well as grammar checkers, belong to this category of independent tools. **Thesaurus dictionaries** use as their basis a tool called OpenThesau-

rus, which is web-based software for building a new thesaurus. It was developed by one of the Lingucomponent contributors, and is now used for developing new thesauruses. Building a thesaurus requires some knowledge of PHP and MySQL. I found five contributors in this category.

Hyphenator dictionaries are created with OpenOffice.org's default program called "ALTLinux hyphenator". My data shows that the two hyphenation dictionary contributors used independent programs in creating their dictionaries.

All seven **grammar checkers** are independent, because OpenOffice.org lacks the connecting interface. The project's home page provides links to these grammar checkers. The grammar checkers currently available could be integrated into OpenOffice.org, but to do that would require knowledge of the OpenOffice.org architecture and programming skills in C++. One of the project's to-do tasks is to extend OpenOffice.org so that grammar checkers could be integrated the same way as spell checkers.

> A grammar checker is independent from OpenOffice.org. What is needed is just the **interface** in OpenOffice.org so that any grammar checker engine can be plugged in, like a spell checker. As far as I know, no development has happened in this direction, so any help is welcome... (Volunteer 7, 6.7.2005)

Creating such an interface was addressed several times in the emails with the conclusion that it would be a very arduous task to create "universal" rules for very different spoken languages.

Four contributors offered other end-user tools. An installation program "DicOpenOffice.org" for installing dictionaries via OpenOffice.org Writer's wizard, and an on-line converter, "OpenOffice.orgconv", were developed directly for OpenOffice.org. The spell checking facilities for a text editor "VIM", a program "ConjuGnu" for conjugating Spanish words, and a word prediction program for disabled people "Favele", were all OpenOffice.org-independent.

Tool-building tools for people developing end-user tools were also on offer: a framework that allows one to quickly build MySpell and Aspell spell checkers from the same base word list, a lexical analysis program, and a Python program for extracting strings from an OpenOffice.org file, and translating them and putting them back.

The tool categorization implies that there are many important contributions a) in the form of plug-in tools for end-user use and b) in the form of tool-development tools for contributor use (both programmers and dictionary contributors), despite the fact that the actual OpenOffice.org code base (its' linguistic component) does not seem to benefit. Most of the tool contributors did not

contribute directly to the OpenOffice.org suite, which explains why the version repository for the OpenOffice.org code showed so few code contributions. However, their additional tools announced on the mailing list play a vital role in the diffusion of the OpenOffice.org suite to countries with limited computational resources. Hence, understanding the tool contributions (the material) is essential for understanding the project's organization and mailing list activity (the social).

7.2 Tool providers' personal paths of participation

Who were the tool providers and why did they choose to participate? I examined the tool providers' institutional background and position in an effort to better understand who these people were. In doing so I also wanted to question the distinction between hobby vs. work (e.g. Torvalds 2001; Himanen 2001), as it seemed to me that contributing some of the above depicted tools in fact required highly developed professional skills and expertise.

Most of the tools announced were developed independently from OpenOffice.org governance in one-man/woman (open source) projects, in small two-member teams, or in small groups as part of some larger project. Some were developed as part of existing OpenOffice.org Native Language (NL) projects. All Lingucomponent leaders also contributed tools.

My analysis shows that over half of the tool providers were from universities, while the rest were from IT-companies or non-profit localizations projects[4]. The institutional backgrounds of the tool providers indicate that these people were professionally involved in the localization of open source and OpenOffice.org. It is if course hard to tell where these people were physically located when contributing (home, work or some other place), and what kind of social networks they mobilized at the time.

In order to answer the question of what motivates these tool providers to contribute, I constructed personal paths of participation for the six interviewed tool providers. The following short path description -narratives are written in a two-phase manner. The key event in bold refers to the actual point of entry/contribution concerning the Lingucomponent project. The events prior to this key event can be seen as reasons/motives leading to it, while the ones succeeding show how motivation to participate in the Lingucomponent project changes over time. With the help of these narratives and some quotations, I reflect on the complex evolving motives of the tool providers.

> Path 1: *From participation inspired by own use and semi-unemployment to participation inspired by family's bilingual background and future work prospects.*

An unemployed oil fluids technologist, a US immigrant, moves to Venezuela to live with his Venezuelan wife. The country's economic situation leads to unemployment. He starts a grocery business and starts using MS Office Excel for maintaining a simple inventory. Because of repeated errors in the program, he switches to Sun's StarOffice. Via this he hears about the open sourcing of the StarOffice code and the new OpenOffice.org project, and starts using OpenOffice.org instead. He offers multiple motives for using OpenOffice.org and participating in the project:

> ...the thing about an open-source thing is kind of a, in a sense of a hobby. I'm sure I spend more time at than my wife would prefer… for the little bit of time that I spend on it, I get an office suite that works and does everything I need to do…also everything else I use is basically GPL … the open source movement is still really a bunch of geeks and semi-geeks at heart… They're basically doing this because they waste so much time playing with computers anyway, that it just gives us some sort of focus… we came to look for things that did not have a purchase price. Mainly just because it's so much easier to download…

Among the unspecified urge to play with computers, most visible seems to be his use-value related need for a costless, easy to download and modifiable office suite "paid off" by means of reciprocity.

He starts contributing to Lingucomponent by porting a Spanish dictionary from Ispell to Myspell because he needs one. After this tool contribution, he founds the Spanish Native Language project, and now starts acting as a liaison between the English and Spanish-speaking people of OpenOffice.org. He is requested to work for Lingucomponent as a co-leader with the tasks of directing mailing list traffic, maintaining the project's website, and uploading dictionaries onto the website. He also actively speaks to different audiences in Venezuela about OpenOffice.org. Simultaneously he takes care of his wife's bilingual play-school's computer club, and does some technical translations. When asked about his future plans, he responds:

> … Set up some courses [related to Sun's StarOffice] and whatever to, to do something to generate some income… I suppose. But that's just basically outside of the OpenOffice thing…

This quote highlights an interesting evolving contradictory motive in relation to the "hobby-speech" identified in the first quote. While he explicitly rejects future work with Sun's StarOffice as not related to OpenOffice.org, one can ask by looking at his participation path, whether this recent development would

have been possible without his commitment and successful career in OpenOffice.org.

> Path 2: *Participation inspired by own bilingual background and occupation as researcher to participation inspired by his growing concern for minority languages.*

A doctor of (theoretical) mathematics works in the US at a department of computer science as a professor. He has also developed an interest in Natural Language Processing, and spends about twenty per cent of his working time programming. Because he is on sabbatical, he spends even more time programming. He characterizes himself as an "old-school" programmer who prefers not to use graphical interfaces. Hence, he does not use OpenOffice.org. He describes himself as peripherally involved, without any particular attachment to the OpenOffice.org project.

He starts working with Irish, his second language, by establishing an open source project for minority languages. **As a result of his own project, he contributes an Irish dictionary based on MySpell.** Further, he develops a command line grammar checker engine for minority languages with limited computational resources. He also develops a web crawler software tool for building minority language corpora automatically. Essentially his work entails "number crunching" on large data. He continues working with representatives of different minority languages, and has contributed seven MySpell spell-checking dictionaries. The intertwining and evolution of different motives can be seen clearly in his speech:

> … I believe, sort of the usual technology engineering arguments, that you produce better software. I'm also something of a radical with respect to free [software]…I have time to, I'm on sabbatical now so I have this year to do whatever I want. Write software… I feel like there's some moral obligation for academic people to release what they do as free software. In the same way that you publish your papers and people can use the results. And that's not really what happens… especially in natural language processing… people write…parsers and grammar checkers and machine translation and all that technology, since it's so hard to develop, people keep to themselves…it hurts minority languages and people that can't…that don't have the sort of economic resources to develop things…people who [I work with] are in Africa ..I mean they are lucky to have an internet connection, kinda puts it into perspective…I don't have any sort of direct interest in OpenOffice.org…I try and attract volunteers in my own projects.

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"The usual technology engineering arguments" as motives for choosing to develop open source could be seen as contemporary hacker-speech, often produced in the beginning of the interview. However, these motives get entangled with others like the values of freedom and sharing and the related problem of producing costly language technology. Moreover, the larger motive of helping those without the necessary economical resources, derived from direct contact with representatives of such countries, blends in with the more temporary motive of recruiting people.

> Path 3: *From use-inspired participation to family-inspired participation to dropping out.*

A software engineer and ex-missionary from of Hawaii works part-time on a university campus as a system administrator while finishing his degree. Now he works full time within the management information systems department. He uses OpenOffice.org (mainly Calc) in doing his job, and has developed "OpenOffice.org lib utility library"–a Perl module to be used for creating simple Calc and Writer documents from the web–in his own open source project. **He starts looking for something to spend his time on and finds a focus via his wife:**

> My wife dislikes me using computers all of the time even though she knows I have a degree in Computer Science. She decided to study Hawaiian and return to school to get a Hawaiian Studies degree, so I figured she would not complain about me working on a Hawaiian spell checker for OpenOffice.org.

He starts dictionary development, but quits because it turns out to be difficult: the existing Hawaiian word lists, which would make his job easier, are owned by the university, and hence cannot be shared. Moreover, he does not speak Hawaiian himself. He would have had to start from scratch. Developing the OpenOffice.org lib utility library on the other hand is easier to tie into his job, so he continues on maintaining that instead of developing the Hawaiian dictionary. He would also like to develop dictionaries for other Polynesian languages because students at his university come from over sixty different countries. He continues promoting, or "converting" (as he says), OpenOffice.org and educating people about it on his university campus. Here one can see how a use-value-related motive of extending the capabilities of the suite grows into a more general need to promote OpenOffice.org. The motive and focus for this general but unspecified need to do something is then found in family-relations. However, it fades away owing to obstacles.

Path 4: *Participation inspired by occupation as researcher, country's economical situation and own mother tongue to participation directly as part of his job description.*

An electrical engineer works as a researcher and teacher at a computer science department in a university in Brazil. **He attends a workshop organized by the Brazilian government, where he is told that a grammar checker would be of great benefit for Brazilians, Portuguese-speaking people.** He initiates a nine-member project, which is led by his professor at the computer science department. They share an interest in research concerning Natural Language processing and in Free Software philosophy.

For one year the university team works on the grammar checker without getting paid. Eventually the team gets funding from a governmental organization that supports technological projects. With new computers, the team is able to put more time into developing this important tool:

> …we are working in a university, in a public university. And these universities don't have financial support to keep computers and we are working with Pentium, about 10 years old Pentium. Could you imagine working, very, very low computer? And with this support we bought a computer, new computers and a great change to our project. Our dedication was improved, our dedication to our project…because we need relate this results to [research funder], our results of the project, research to [research funder].

His occupation as a researcher provides the ground for the motive of starting a new project, and hence helping his compatriots. The significance of the open source-policy taken by the Brazilian government in the emergence of this new research object should not be underestimated. The research team's volunteer working period is also motivated by the hope of eventually obtaining funding. Getting funding on the other hand changes the team's motive towards producing results for the sponsor. They also actively seek, without success, someone on the mailing list who could reprogram some OpenOffice.org code so that their tool could be integrated. Recruiting can be seen as a temporary motive for participating in Lingucomponent. Eventually they have to recruit a trainee student from their university to learn how to do it. They manage to release a version of their Portuguese grammar checker for Windows. Now they are working on a version for Linux.

Path 5: *Participation inspired by studies to participation inspired by need expressed by compatriots and spare time to participation inspired by future collaboration in work context.*

A computational linguist from Germany works for a small company that specializes in information retrieval (e.g. thesaurus search). The company uses the Apache "Lucene" search engine as the back-end for its products. He contributes to Lucene in his free time. He reads the OpenOffice.org German NL mailing list and finds that there is a need for an open source web-interface allowing people to collaboratively collect synonyms of the German language. As a student he has the time and starts his own open source project "Open Thesaurus", because he was familiar with MySQL, HTML and PHP, and because "nobody is going to do it if not me".

As a result of his own project, he contributes a German thesaurus licensed under the GPL to the Lingucomponent project. The starting point for him is that the source must be open if he is to contribute to it or use it. Simultaneously after office hours, he writes "LanguageTool", an English grammar checker that can be adapted for other languages. He ports LanguageTool to the Java programming language, and starts actively maintaining and developing it after a two-year pause. Meanwhile he is appointed 'content developer' in Lingucomponent. He speaks at the OpenOffice.org conference in 2005 about the linguistic tools of Lingucomponent. He also does bug-reports and fixes and helps the maintainer of the German spell checker in cleaning up the word lists. He would like to integrate a German grammar checker into OpenOffice.org. The intertwining of work and "hobby" can be clearly seen in this narrative and in the following excerpt:

> I prefer working mostly on my own and then integrate my stuff into other projects…the fact that you get to know people who have a clue about special topics is really useful. For example, the maintainer of the German spellchecker currently helps at our company with an important project. She also added support for German to my LanguageTool project. Also I'll give a talk at a German conference about computational linguistics. This might not have been possible without the fact that OpenThesaurus is integrated into something as well known as OpenOffice.org.

The motive of recruiting people with specific knowledge to his own projects as well as his company's projects can be identified. Moreover, his multiple parallel activities/technologies and people are linked to each other in indirect but inseparable ways transcending the boundaries of worker and volunteer.

Path 6: *Participation inspired by family-reasons and unemployment to participation inspired by compatriots and professional future prospects to participation as a job description.*

A doctor of civil engineering (geomechanics) from France decides that he does not want to pursue a career abroad owing to family reasons. He starts looking for a job in the software business because he has some experience in programming. He is employed for two years by a software firm. While unemployed he bumps into open source and OpenOffice.org. He joins the French Native Language project, and contributes an on-line line converter called "OpenOffice.orgconv", because others invite him to, and because he wants to improve his programming skills:

> When unemployed I started looking at OpenOffice and started programming and helping on the project [French NL].... "I started on the French lingua community. So, I started as a newcomer, so I asked questions and... How to install...And then some people asked: We need this, we need this. And I wanted to do some programming and I started look at macro and APIs. And so I understood some things so I began to help and said: Oh, I'll create this, I'll create this...And that's why I begin with it...

After this the leader turns to him with problems related to the installation of the French spell checker. He provides a solution by recoding some OpenOffice.org code and writing a dictionary installation macro ("DicOpenOffice.org") for OpenOffice.org. Then he proposes his engine on the Native Language Confederation list, where the tool is accepted as part of OpenOffice.org.

With the help of the Lingucomponent leader, DicOpenOffice.org is made a default tool of OpenOffice.org and hence can be used outside the French NL community. He uses the tool to verify that the dictionaries sent to Lingucomponent are installable. Eventually a software company that supports open source software employs him. His job is to promote OpenOffice.org and oversee its connection to the company's content management framework. Hence, he continues contributing to the French NL and via this to the Lingucomponent project:

> ...and now I have a new job I continue to program and to be involved in OpenOffice.org because it's a part of my job.

This last narrative showed how a change in professional orientation and succeeding unemployment leads this tool provider to volunteer and develop his

programming skills in OpenOffice.org, eventually obtaining an OpenOffice.org-related paid job.

7.3 Conclusions

This analysis aimed at developing a more detailed, dynamic and content-specific approach to studying open source contributors' motivation than has been the case in previous studies. The results of the analysis shed critical light on such simplifying explanations such as "hacker ethic" or "hobbyism" or the static intrinsic–extrinsic distinction in explaining the motivations of open source contributors. Instead of motive categories, we find complex and changing *patterns of motivations* that are tied to changing objects and personal histories prior to and during participation. Despite the fact that viewing individual motivation as a unique process is not new (e.g Vroom, 1964; Maslow, 1954), this analysis showed, that the process was not linear. It was the product of a combination of contingency and emergence as well as active seeking for new opportunities in personal and professional growth.

   The analysis of types of contributions showed that instead of working together on a common code base, as is usually the case in open source, the Lingucomponent contributors worked alone with their own code-bases or text-files. Hence, it is not enough simply to observe submitted code to the shared code repository. Only one Lingucomponent contributor submitted code to the actual code base of OpenOffice.org. However, a group of people making tool announcement on the mailing list seemed central to the project because their contributions added use-value to the OpenOffice.org office suite. Albeit most of these "tool providers" did not contribute code directly to the project's code base, their plug-in and independent tool contributions can be seen as essential for the development and diffusion of the OpenOffice.org suite. While the project's division of labour turned out to be highly specialized, this analysis showed that the contributors were attached to an expanding object of activity. They contributed to enhancing OpenOffice.org's language capabilities so that it can diffuse to countries and language regions lacking needed economic and /or (computational) resources. The collective object proved complicated and hard to grasp, because it was not a shared base of code (Lingucomponent module), but rather the emerging network of the open source language technology system (see Figure 6).

OpenOffice.org
Linguacomponent
module

OpenOffice.org
interface

Pug-in tools

Independent tools
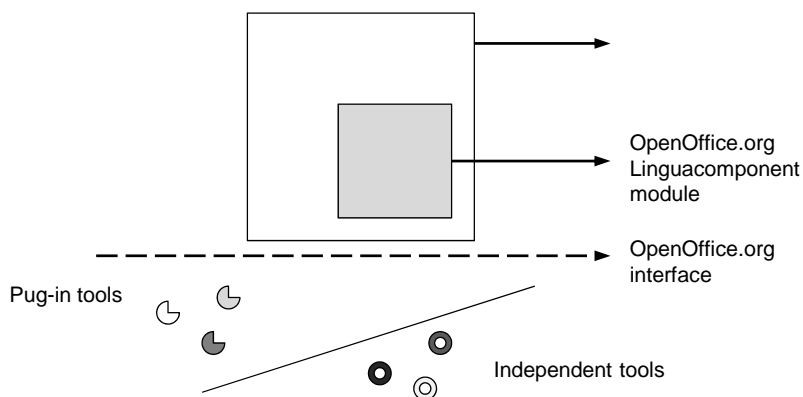
Figure 6. The relation between the tool providers and the core OpenOffice.org code: what is the shared object of activity?

The analysis of the tool contributors' personal paths of participation on the other hand showed that each had a unique set of motives related to their respective life situations: studies, profession as a researcher, sabbatical, unemployment, own use of linguistic aids, mother tongue/bilingualism, family reasons, and/or larger societal and economical concerns. My finding that personal need for software drives development is in line with earlier research (e.g. Weber 2004). This analysis shows that in some cases this motive was at play in the early stages of participation as a kind of entry point to the project (Shah 2006). Often, the need for linguistic writing aids was met by one's own contribution. This event made it possible to catch *motivation in movement*, the transition of this tool-motive into another, for instance helping native language compatriots while simultaneously rehearsing leadership skills and knowledge on OpenOffice.org.

To those who did not use OpenOffice.org, the point of entry was professional: the motives were to recruit people for one's own projects, to work on an emerging research object, to get funding, to publish results (moral and economic obligation), to produce linguistic aids for their compatriots and/or benefit languages and countries lacking computational/economical support. One tool provider wanted to enhance his programming skills and capabilities in the advent of unemployment and professional re-orientation, eventually obtaining an OpenOffice.org related job. Two tool providers indicated an unspecified need (passion/obsession) to engage, among others, in activities involving computers. In one case this unspecified need found its object via his spouse. Participation was in most cases related indirectly or directly to their occupation or field of research expertise, or resulted in an OpenOffice.org-related job. Indeed, the process of motivation is a messy thing that is hard to neatly reduce into

categories. Reflecting on the tool providers' patterns of motives indicates that human motivation is not reducible to "homo ludens", "homo economicus", or "homo sociologicus", but entails a complicated mix of all. The findings indicate that the boundaries between work and hobby within the individual's participation path are blurred and shifting. Consequently, the distinction between work and hobby seems artificial.

Open source motivation research that leans on predetermined motive categories such as intrinsic and extrinsic tends to reinforce existing hacker ethic discourses. Such categorizations leave no room for unexpectedness and contingency. Professional development often requires expanding and extending oneself across different social practices, thereby blurring and shifting the boundaries between work and hobby. More generally, temporal employment and project-like work challenges the individual to use all the means available in pursuit of his/her career. Doing something passionately and playfully, just for fun (e.g. Himanen, 2001), is a gross oversimplification of people's motivation. Presumably all work can be rewarding and fun but also entail periods of frustration. On the basis of the Lingcomponent case, the validity and usefulness of the concept "volunteer" in open source language technology development is questionable.

Although this study on volunteer motivation is limited by a small sample size, a focus solely on language technology, and the time-consuming difficulty of tracking biographical data, the results could be of value in formulating future survey questionnaires. However, many cases are not required to understand that motivation is a unique complex evolving process in which the material and the social are inseparable. Even if the results may not be generalizable inside OpenOffice.org, it could be that open source language technology development in general, especially minority language technology development, has the kinds of characteristics found in this study.

Further, the personal paths of participation showed that the contributors belong to many different communities simultaneously, which is in line with the idea of "multimembership" in CoP (Wenger, 1998). However, the peripheral participation of the tool providers in relation to the core Office.org development was not a preceding situation but a permanent state of affairs. It can be noted however, that these open source language contributors are not necessarily peripheral members in their other respective communities. For example, in their own development/research projects they may be core members and old timers.

Moreover, the analysis of the contributions and motivations of these volunteer tool providers indicated either a very loose connection or no direct connection with the OpenOffice.org product and source code, which highlights the complex relation between the community and the object of activity. Rather than seeing the Lingucomponent volunteer contributors as co-developers/contri-

butors, they can be viewed as "independent entrepreneurs" seeking to find a "collaborative community" of users and co-developers for their own projects and technologies. In this sense the Lingucomponent project can be thought of as highly individual and only potentially collective. However, the tool provider's tools complemented each other in the sense that the greater the number of language regions represented, the better access to and more extensive the use of OpenOffice.org around the globe. The mailing list as a publication forum can be seen as the main collaborative tool for conducting a search for complementarities.

8 USER FREEDOM OR USER CONTROL: THE DISCURSIVE STRUGGLE OF CHOOSING AMONG OPEN SOURCE TOOLS IN THE FINNISH PUBLIC SECTOR

While the previous analyses concentrated on the volunteer contributors of OpenOffice.org and highlighted the changing concepts of "user" and "volunteer", this chapter[50] explores the notion of 'end-user' in open source. It goes beyond the immediate boundaries of the OpenOffice.org project to examine the implications of global open source development to local activities, in the present case, to the Finnish Public Sector ICT decision-making. Let us now turn to the actual sites where qualitative data was collected. The start of the millennium marked the beginning of the open source "hype" in the media and in the Finnish public sector. The Ministry of Finance (MF) investigated the possibility of using desktop FLOSS for administrative purposes in 2001-2002. The Ministry organized a small-scale test project and three seminars for discussing the experiences of different organizations and branches of the administration. The Ministry of Justice (MJ) and the Finnish Meteorological Institute (FMI), among others, took part. After the project initiated by the MF, the MJ and the FMI continued exploring the possibilities of FLOSS use in their respective organizations. The city of Turku conducted a study on FLOSS at around the same time. The next sections briefly describe the studied public sector organizations and their decision-making processes concerning the (possible) FLOSS adoption. The narratives are constructed on the basis of interviews and additional historical documents[51].

The Ministry of Justice (M of J)

The M of J maintains and develops the legal order and legal safeguards and oversees the structures of democracy and the fundamental rights of citizens. The ministry is responsible for the drafting of the most important laws, the functioning of the judicial system and the enforcement of sentences and employs approximately 10 000 workers. Document handling is a central task in the MJ. While secretaries form the biggest user group, IT staff, judges and other clerical

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[50] With the permission of the Information Technology and People-journal, the analysis presented here is identical to the one that will is about to be published (Freeman, forthcoming).

[51] See Appendix 3.

staff also use office applications. WordPro was used as a text editor until the combined use of OpenOffice.org[52] (85 %) and Word (15 %) replaced it in 2007. The process from the initial idea to the final decision took over five years. The OpenOffice.org office suite has been installed on 10 000 computers, and hence represents by far the biggest transition to open source in the Finnish public sector. The IT manager and the office automation trainer were interviewed for this study.

The starting point for the MJ's inquiry was the practical condition that the existing text editor Word Pro was becoming out-dated and new possibilities had to be evaluated. "Petteri", Systems Analyst and project manager MF's OpenOffice.org investigation, actively followed new IT trends in the Finnish media and participated in the trial project organized by the MF in 2002. He started planning the pilot in 2005 assisted by the users' voice "Klaara", who is the MJ's office-automation trainer and has been working in-house since the time of punched-card machines. Petteri distributed OpenOffice.org CD-ROMs and Portable OpenOffice.org memory sticks in-house before the actual pilot project. Klaara was the first person to obtain these artefacts from Petteri who then encouraged her to redistribute them to anyone interested. He also distributed these tools to IT key people from different bureaus hoping they would further test them further. Petteri and Klaara can be regarded as the MJ's OpenOffice.org spokesmen. Both participated in a steering group that was set up to discuss the progress of the pilot. The implementation of the pilot involved a number of partners, whose services were bought from outside the organization. The steering group met seven times during 2006.

The final decision was postponed and proceeding with caution was preferred for several reasons. "User resistance" would need to be overcome, and time for research was needed because there were no best-practice examples available in Finland at the time. Being a pioneer was somewhat alarming. During the decision-making process, both the OpenOffice.org suite and the localized Finnish version underwent development. In addition, Sun and Novell agreed to provide support for OpenOffice.org, which was a welcome answer to the concerns over support brought up in the steering group. The steering group also found it important that OpenOffice.org sustainability was backed up by a reputable firm, Sun Microsystems. Compatibility with MS Office as well as adequate functionality was also discussed in the steering group. The reports claimed that the latter had been tested in the pilot project. The PDF converter was found so useful that OpenOffice.org would remain installed on the computers even if the

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[52] OpenOffice.org is the open source equivalent to Microsoft Word. It includes a set of applications such as word processing, spreadsheets, presentations, drawings, web publishing, email, scheduling, and database.

final decision had not been in favour of the major transition. The outcome of the pilot was a report, a user manual, and a question-and-answers manual, all publicly downloadable from the Internet.[53]

The Finnish Meteorological Institute (FMI)

The FMI is a research and service agency under the Ministry of Transport and Communications. The main objective of the FMI is to provide the Finnish nation with the best possible information about the atmosphere above and around Finland, to ensure public safety relating to atmospheric and airborne hazards, and to satisfy requirements for specialized meteorological products. A large proportion of the workforce holds a master's degree or equivalent. Altogether four people were interviewed: the IT manager, the manager of technical services, the IT-support person and the IT unit's communications officer.

The FMI staff is comprised of three main groups: programmer-researchers, meteorologists, IT/ support and software development personnel, and clerical administrative staff. The researchers have gained familiarity with UNIX from their university studies and many have followed the development of Linux from the very beginning (1991, version 0.1). They have generally had a free hand with respect to choosing software. Linux is used both on the server side and on the desktops of researchers. The clerical administrative staff prefers Windows and Word. The volunteer-based attempt to adopt open source had two distinct phases: the gradual dissemination of Linux from 1990 onwards, and the Thin Client[54] experiment that started in 2005.

The origins of open source in the FMI can be traced back to the 1980s. In those days "Jukka", a researcher, nowadays the FMI's IT manager, was one among others in the space research department who started using UNIX. UNIX was used in the universities before the adoption of Microsoft. Jukka heard about Linux via Helsinki University (Linus Torvalds) in 1990, tried version 0.65, and has been using it ever since. Since he was the head of IT back then, he was able to influence the direction of IT development and he used every opportunity to market Linux in-house.

Linux-based systems were and still are used for programming measuring devices such as space probes. Accessing source code was crucial and Linux was the only system in which the whole documentation chain was available at the time. "Katja", the manager of technical services and former IT manager and information systems manager recalled that the transition to Linux was not smooth. Not only was there an emotionally charged atmosphere between Linux

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[53] For a recent more comprehensive account of the adoption process, see Karjalainen (2010).

[54] Thin Client is a user terminal that can be run with different operating systems.

and Microsoft users among the IT staff, there was also controversy regarding the choice of Linux distributions. The divergent viewpoints were bypassed by conducting a SWOT analysis[55] in the IT management team, and by relying on the advice provided by external operating-system experts.

The Thin Client experiment started in 2005. Until then, most of the researchers had been using a typical PC environment connected to servers. Thin Client is a new user terminal that can be run with different operating systems. The FMI chose a Finnish solution known as "LTSP", which is a Linux-based simple terminal with no moving parts and no extra heat or noise. It offers users a set of open source software applications (e.g. OpenOffice.org, Firefox and Thunderbird) plus the proprietary MS Office and more memory space.

"Antti" and "Helena", both fairly new employees, were given the task of introducing Thin Client to the FMI's users. While Antti represented the technical viewpoint, Helena (M.A in education) acted as the users' advocate. Antti was in charge of IT maintenance and support, and his special task was supporting the LTSP Thin Client terminal. He started off with Windows-related work but now spends most of his time with Linux since it is more challenging to work with. Helena was recruited to the IT Unit from in-house personnel management to disseminate information about Thin Client because "she knows what questions to ask and she can understand the user's perspective better that any one of us", as Antti put it. Thin Client was marketed via personnel magazines and Introductory Thursdays, which is a tradition within the FMI for informing staff about innovations. A demonstration was set up in the unit's computer class to show how much less energy Thin Client uses: green values were used to motivate potential users, aware of the threats of global warming.

All the interviewees stressed that the word "project" was perhaps a misnomer for the events that took place since there was no planned pilot or comprehensive testing. After occasional system crashes, people were put off. In a subsequent follow-up email Antti announced that he was leaving the FMI at the beginning of 2008. This meant even more uncertainty regarding the TC experiment. Almost half of the 300 researchers and IT staff had adopted it by the beginning of 2008.

The Ministry of Finance (MF) and City of Turku

The M of F provides the macroeconomic and fiscal policy framework for the Finnish Government, drafts the annual Budget, and offers experience in tax

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[55] "SWOT" stands for "Strengts, Weaknesses, Opportunities and Threats. It is a well-known strategic management tool in evaluating businesses (http://en.wikipedia.org/wiki/SWOT_analysis).

policy matters. It also participates in the work of the European Union and several international organizations. It administers altogether the ICT units of the whole state administration covering some 120 000 workers with approximately 160 000 PCs and 4 800 different software programs[56]. Much of the ministry's work involves the production of reports of various different kinds. The MF's special expert, and member of the State IT supervising team "Kaarlo", was interviewed since he participated in more or less all the open source forums in Finland when open source became a media event.

The M of F was among the first to actively look into the suitability of open source for administrative use in Finland. This was quite natural since the MF is responsible for following up global policies and trends within the software market. A series of seminars were organized by Kaarlo and some of his colleagues in which open source was introduced to other public sector organizations and workers. Both the MJ and the FMI participated in the seminars. Kaarlo's report led to no action: the recommendation was that open source "is worthy of consideration, but that "generally open source development is hard to evaluate". Kaarlo explained that the transition to OpenOffice.org would have been next to impossible due to the complexity and sheer volume–4800 applications–of the software systems as well as the number of users, PC's, and agencies. The MF's interest in open source made it a more mundane issue in Finland. In the future, open standards, rather than the opposition between open and closed would be more important for State administration. Perhaps, had the timing been different with regard to the current state of the OpenOffice.org suite, it would have been considered more seriously

Two persons from **the city of Turku** were interviewed: "Erkki", head of the city's IT and "Pasi", an IT teacher from the educational branch. Both have followed the development of open source closely from the beginning of the new millennium. The City of Turku investigated open source during the years 2000-2001. The main reasons for the investigation was that Microsoft had made some changes to its licensing costs, and the Finnish version of OpenOffice.org had been published. The team responsible for the open source investigation was composed of three people (including Erkki). Erkki questioned the team's competence: persuading the management, the political decision makers and all the workers within the city administration would have required far more variety skill-wise: technical, economic, marketing and media skills. IBM and Fujitsu were consulted, but the three-person team did most of the work. The posting list

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[56] These numbers refer to all governmental bureaus in Finland in 2007 when the interviews were conducted. The situation now might be different since the number of employees has decreased from 250 000 to 90 000 (see http://www.valtiotieteilija.fi/node/111).

of the Finnish Linux User Group's (FLUG) was used for asking open source - related questions because it was responsive and fast.

The actual testing for the pilot project comprised two phases. The first was said to have involved a heterogeneous group of volunteer users. The second phase was unsuccessful since only few participated. The pilot report compared Windows and Linux. Erkki reflected that the section on Windows might have been too large. However, this was partly done on purpose because open source was unknown to management and users, and because they needed a reference point. The final decision not to adopt came in the beginning of 2004. Turku renewed its contract with Microsoft. The team was astonished since they had had management support almost until the finishing line. In the final meeting the top managers sat in silence.

Open source programs are nowadays quite widely used on the server side, but office software remains proprietary. All in all, Turku's inquiry received a lot of attention and Erkki gave presentations on many occasions in Finland and Sweden. Erkki has agreed not to give speeches anymore, but he does send pilot reports on request. Pasi reported that the educational branch concluded that "the de facto standard" within the software business is still mostly proprietary software, the only exception being Eclipse, which is an open source programming tool.

Four distinct and persistent discourses emerged in the analysis of the data. These were: (1) a discourse of economic-technical efficiency; (2) a discourse of governance and regulation; (3) a discourse of an idealistic open source user; and (4) a discourse of an ordinary office software user (See Table 5). The starting point for recognizing the discourses was the societal-level open source discourses introduced earlier and the methodological concept of dilemmatic discourse. The different discourses in the analysis were identified on the basis of the vocabulary they used, as well as the assumptions the vocabularies articulated. Hence, each discourse has a distinct vocabulary. The vocabulary was identified in many cases directly by looking at the use of explicit words (Billig et al. 1998, p. 22; Fairclough, 1992, p. 185).

Discourse 1 comprised all utterances in which words indicated quantities and speed (see first row, second column in Table 6). The name "economic-technical efficiency" is used because both economic and technical operate on a numerical level: FLOSS is used for reducing costs either directly by reference to money or indirectly, through a more efficient production process. Discourse 2 comprised opposing dilemmatic utterances used by same people in which words indicate technological neutrality on one hand, and technology as a control tool on the other (see second row, second column in Table 6). The name "Governance and Regulation" designates the fact that governing is always connected to a regulatory system, that is, they cannot be separated. Discourse 3 comprised utterances

in which words expressed passionate attitude towards disseminating open source (see third row, second column in Table 6). Discourse 4 comprised utterances in which words expressed the ordinary user and his/her IT skills and qualities in general (see fourth row, second column in Table 6). Interpreting the underlying assumptions within a discourse involved multiple levels of meaning making (Billig et al. 1998, p. 23; Fairclough 1992, p. 85), and it was done with the help of the theoretically derived intermediate concepts.

For instance, all the utterances in which the explicit reason for favouring open source was articulated had to do with efficiency; either direct monetary savings or faster use and development. This economic-technical efficiency discourse resonated with earlier literature, and the vocabulary used for instance in surveys (cf. Ghosh et al. 2007). However, all the other discourses and their respective vocabularies had to do with implicit reasons for favouring or rejecting open source. These involved articulations of the nature of technology in general and its intended uses ("governance and regulation"), and the qualities of different types of users ("typical users" and "idealistic users"). These three latter discourses express both implicit and explicit forms of control by means of open source technology (cf. Lessig, 2009; Winner, 1985;). More generally, each public sector discourse has contradictory and dilemmatic qualities (Billig et.al, 1998) thus reflecting the very nature of human thought processes and the manifestation of power struggles in speech. Common to all discourses is that they reflect a tension between, on the one hand, the ideal of open source as liberating the user, and on the other, the desire for better user control. The following subsections introduce the discourses through examples from the data. The discourses are summarized in Table 6. A summary of the central findings is offered at the end of the Findings section in Table 7.

Table 6. Four public sector ICT discourses

Discourse	Expressions frequently used in the discourses	Number of people, speech turns & individual utterances
1. Discourse of economic-technical efficiency	Cost-savings, costs, money, cost-based, cost-evaluation, licensing costs, being able to afford, budget, sum, sum of money, calculation, calculate, expense, statistics, Euros, data security, ergonomics, payment, exchange, free of charge, shortage of money, profit, estimates, economic information, more new products and new markets, expensive, availability percentage, easy access of code, ease of use, fast, broad functional aggregates, stability, stable, effortlessness, minimal data loss, load, energy consumption, more disk space, quality, cost benefit, consistent, personal wallet, faster bug fixing	10 P 49 S 133 U
2. Discourse of governance and regulation: Technological neutrality vs. Better governance by means of standardization	Open source is only a tool, Open source is just a tool, Open source & proprietary are alike, OpenOffice.org is a tool among others, equal competitors, the same, same philosophy, one and the same, a text editor is a text editor, the same as long as it works Standardization, centralized, management, one-fits-all approach, maintenance, governance, steering, control over user rights, better pilot planning and organization vs. ad hoc experiment	7 P 23 S 29 U 7 P 24 S 66 U
3. Discourse of an idealistic Open source user	Open source as a mission, Open source as a religion, to sell ones soul to Open source, Open sources are muddle-headed, propeller headed, freaks, open source believer, radicals, open source idealism, two opposing camps, to rant, blessing, abrupt differences of opinion, Open sourceers are charismatic people, expressers of opinion, emotional charging, Anti-Microsoftism: OpenOffice over Word, Linux over Windows, Linux people vs. Windows world, pioneers, competent, intrinsic interest, green geeks by definition	10 P 39 S 44 U
4. Discourse of the ordinary office software user	basic users, office workers, secretaries, judges, administrative users, clerical staff, summer workers, new employees, general users, teachers, user by definition resist, resistance was inevitable, the significance of pilot project in overcoming user resistance, basic users have no special needs, users are ignorant, make additional questions, an easy client takes whatever tool s/he is offered – no prior needs, easiest client is invisible, users' IT skills are generally poor, open source has not been explained to users, 'green values' sink in/work best for users, user are suspicious, users break things, reserved, in need of radical action, users should be educated (specific user needs vs. public needs)	10 P 34 S 58 U

8.1 Discourse of economic-technical efficiency

All the interviewees made utterances that could be interpreted as a distinct discourse of economic-technical efficiency. References to numerical, quantitative and performance-related qualities were made thus reflecting the potential power of numbers in decision-making (cf. Denis, Langley & Rouleau, 2006). Notions such as innovation and creativity (e.g. von Hippel, 2005) that would first appear to belong to a different discourse domain were used in justifying economic-technical efficiency arguments (Berry, 2004). The reading of the vocabulary used in the IT journals "Tietoviikko" and "ITviikko" on FLOSS in 2000-2005[57] shows that the speech of public sector actors on FLOSS resonates with the discourse of economic-technical efficiency.

This discourse category is large in terms of individual utterances because many of the speech turns/utterances were short and could mostly be directly identified:

> The arguments were at first cost-based, because cost-benefits were indisputable especially in server solutions and because cost-efficiency was easily attained on that side. (Petteri)

> They (users) ask why open office and not the office-package (Microsoft), so I say that 7 million euros...would you take 7 million euros in to your text-editor, or do you think about children and the elderly. So one can see how people start thinking like just a moment, really. When I say that it is out of our tax money. It has been calculated; it was around 7 million. (Klaara)

Petteri, like all the interviewed IT mangers, followed IT trends and directly drew on arguments presented in the IT media. However, in the second quote an attempt is made to widen the discourse by reference to social welfare in justifying the cost savings argument to users. Nevertheless it ends by using the vocabulary of the economic-technical efficiency discourse.

There were also some more dilemmatic and indirect expressions that needed careful reading. The next quote is an example of one of three dilemmatic passages found within the economic-technical efficiency discourse:

> …we used Linux-based systems for programming space probes because they were the only system in which the whole documentation chain was available at the time. UNIX licences cost about 100 000 $ for academic

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[57] Low cost, reliability, security, transparency, efficiency, innovation, creativity, quality, licensing and functionality were among the vocabulary presented in the media.

needs and other systems were not available. Back then openness and sharing of ideas were the backbone of the scientific approach. This is a supporting principle for me. My ideas about open source software come from Richard Stallman's idealistic viewpoint, which I share. IT magazines have been very conservative and have–except, in recent years– lagged behind with [FLOSS] development. Even today very few people see how openness is an essential structural factor…If [openness] absent business becomes clumsy, expensive and slow. A diversiform IT environment makes it impossible to rely on one supplier. Knowledge about technical solutions have to be available free of charge. This is how innovation is created, and via that new products and a market. This can be understood in a different way too. If we have N building blocks, combining them makes~$N \times N$ products. Combining three~$N \times N \times N$ products. Free information means access to components through which ones own innovativeness produces new products. There can be a lot more products in a free capitalist paradigm. (Jukka)

It starts with a direct reference to licensing costs as the reason for starting to use Linux in FMI. Then it uses a different vocabulary (openness, freedom, exchange of ideas, creativity, transparency, access and innovation) to explain the advantages related to FLOSS. The speaker was the only one who made explicit reference to academic needs or to the philosophy of the FLOSS-advocate Richard Stallman. The Free Software Foundation initiated by Stallman emphasizes that Free software is a matter of liberty, not price, and that to understand the concept one should think of free as in free speech, not as in free beer. A closer look at what first appears a kind of "empowerment/freedom discourse" (Benkler, 2006; von Hippel, 2005) is in fact used inside the economic-technical efficiency discourse frame. Here freedom to interact with resources seems to imply better access to resources and hence better return on investment.

8.2 Discourse of governance and regulation

The discourse of governance reveals how the "politics" of technology is inscribed in public sector actors' speech. Characterized by implicit and explicit expressions of control, the purpose of open source translates into something very much the opposite of what has been indicated by the idealistic discourse on open source. The contradiction between technological neutrality and technology as a means for better user control, are two sides of the same coin, i.e. of regulation and control. This discourse category emerged from the literature on political embeddedness of technology (Lessig, 1999; Benkler 2005; von Hippel, 2005; Berry & Moss, 2007). Altogether eight out of the ten interviewees made

utterances that could be categorized as belonging within this discourse domain. The expressions seemed to fall into one of two distinct and contradictory themes: technological neutrality vs. better user management by means of technology. The expression of technological neutrality can be seen as contradicting the technology-as-politics view (Winner, 1985). The same people expressed both themes, and thus provided an insight into the dilemmatic nature of human thought (See Billig et al., 1988). First, some examples of the technological neutrality theme are presented:

> …OpenOffice is only one tool among others. (Petteri)

> I think it is the same whether we write with that (OOo) or word pro or something else, there is nothing there in that sense. (Klaara)

> It's the same whether OpenOffice or Office... (Kaarlo)

> An operating system is an operations system, that's it, there is nothing peculiar about it. They have similar kind of philosophy…the same scheme in all, same principles. (Erkki)

The vocabulary in the above excerpts indicates that software technology is seen as merely a practical and technical matter of fact; open source tools are no different from proprietary ones. Software in general seems to be viewed as free from politics and ideologies (Winner, 1985; Berry & Moss, 2007). In the next example, technological neutrality is presented from a slightly different perspective:

> It (Linux) didn't need any (marketing), our department's management wasn't at all interested in it. Really it was the same, and it's good in fact, and that's how management is, as long as it works…the less the IT staff is seen around the better it is really for high-level management, so they don't come and bother them with coding stuff. But I don't personally have passion for anything, so my point of view is similar to our steering group's that is all the same as long as it works. (Katja)

The speaker positions herself within this technological neutrality discourse with reference to the steering group that she is part of. This excerpt portrays top management as nonchalant with respect to software policy, i.e. software decision making. As long as the IT staff is out of sight, top managers do not have to take any particular stance on open source, and the IT staff is left in peace to do whatever they see as appropriate. This discourse does not seem to resonate with

Lessig's (1999, pp. 58–60) quest for transparency in IT governance by means of open code.

The interviewees also contradicted themselves by simultaneously engaging in a management-by-means-of-technology discourse. In contrast to the previous open source-neutral assumptions, the following excerpts indicate a quest for better (and easier) maintenance of user desktops by means of standardization[58]:

> An attempt has been made to narrow it (the selection of software) down. So in fact the aim is to standardize it clearly. On both sides, open source and MS Software, you get the particular packages, and that's ok then…so this is also a way in which we search for standardization and you can't bring it if you don't have any tools...of course you can download from the internet, but it might be that this too will be restricted somehow. At least from the point of view of maintenance, they will not be maintained. (Katja)

> LTSP solved the problem of the centralized maintenance of a Linux environment. (Jukka)

> Now that the general theme of data administration is one fits all, workstations will be standardized as far as possible and with as few right of access for the user and this is how we'll be able to keep things together…this has been the concept thus far. But FMI and Helsinki University are somewhat different environments. But there too it could be possible, one could try to implement the one fits for all thinking, but they have clearly gone in a different..but we, most of the state government actors, are those who implement the same for everyone with no exceptions… (Kaarlo)

All the speakers drew on what can be called a vocabulary of governance. The first two speakers from FMI imply that Thin Client was in fact intended as a vehicle for better desktop maintenance. The third speaker emphasized the need to think in terms of a more general one-fits-all approach to data administration. By providing a set of predetermined software applications and hindering the downloading of others, the aim of desktop standardization is to make things more manageable for IT staff. Standardization would seem to contradict the idea

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[58] "In the context of social criticism and social sciences, standardization often means the process of establishing standards of various kinds and improving efficiency to handle people, their interactions, cases, and so forth. Standardization in this sense is often discussed along with (or synonymously to) such large-scale social changes as modernization, bureaucratization, homogenization, and centralization of society." (http://en.wikipedia.org/wiki/Standardization)

of the user's freedom to select his/her own software tools in the spirit of open source (see Benkler, 2006; Lessig 1999, von Hippel, 2005). The next excerpts provide examples of indirect and dilemmatic statements concerning standardization and user freedom:

> They (researchers) do write code. And that is perhaps our biggest challenge, how to maintain… If they are coded in a different style we can't maintain them and then the poor researcher has to maintain it for the rest of his/her life and cannot pursue his/her brilliant career…So researchers indeed get rid of routine tasks, then of course, the older ones, they might not be so enthusiastic, but rather maybe tend to favour routine control too, or I don't know if this is the situation, this could be a guess, but it is easier if you know that stuff. It might be that other things are done too, but one nice thing is that you know that you can handle it from the beginning to the end...(Katja)

> The organizational culture here is very free. You wouldn't believe how free it is. If someone wants to use something, the aim is always to try and provide him/her with the opportunity…I can't imagine any other place where the culture is so free with respect to software. And this of course adds to our workload, in both good and bad ways. (Antti)

The speakers are concerned with the free and volunteer approach to software selection and development in FMI, a theme that persisted throughout the interviews. FMI's researchers want and are allowed to construct their own (re-) programmable software toolkits. The IT manager Katja's dilemmatic utterance seems to indicate a back and forth movement between better user-control on the one hand and the liberation of the researcher from routine tasks despite the fact that the researcher might want to continue being in control of his/her software. Antti's speech opens up an interesting dilemma concerning the implications of user freedom to IT support: user freedom can be interpreted as the IT support person's ball and chain.

8.3 Discourse of the idealistic open source user

The discourse of the idealistic open source user illustrates how the individual preferences/motives as well as the institutional position of IT-skilled IT staff can potentially influence the way open source is furthered in-house. This discourse portrays the open source user as a technically competent anti-Microsoft missionary, who is eager to make a change by infiltrating open source whenever he has the chance. When all the interviewees spoke about this type of a user

they made reference to knowledgeable IT users such as IT staff, IT management and FMI's researchers. The first excerpt shows how a vocabulary of "religious faith" is drawn on in talk about the idealistic open source user:

> We have this chap Petteri, who has sold his soul…he never hid it from anyone, but on the contrary, has wanted to from the start that everyone knows, I was the first one to (obtain an OOo cd) when he started disseminating this thought here… so everyone has obtained one, and here it is, disseminate…and now he is operating so fast with this OOo that these people are a little rattled, so to say…(Klaara)

The speaker refers to the M of J's open source advocate who relentlessly furthered his mission in-house. He even started training OpenOffice.org use before the actual decision was made, and at times his enthusiasm had to be checked.[59]

The second speaker used to work at the University of Helsinki and happened to sit in the room next to the one occupied by Linus Torvalds, the creator of Linux. However, he was not interested in Linux then nor has he become an enthusiast since. He contradicts the other speakers by distancing himself from "them", the "open source believers" and sees the "religious approach" to software as a threat to high-level decision makers.

> I have experienced open source believers as a direct problem here, those who say that it has to be this unconditionally and they fight for that open source. (Kaarlo)

The third speaker, who has tried to further open source in the educational sector, positions himself on the side of the Linux religion:

> I think that it is a matter of religion, either you are on the side of MS or Linux. I don't really know if there is any other reason...yeah it's (open source) the thing of us freaks... (Pasi)

The fourth speaker refers to a motto that greets him on his home computer:

> Once I had my home is my castle, no windows or gates! (laughter). You don't have to see it purely as antipathy towards some big global corpora-

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[59]This appears also in a comment in the minutes of a steering committee meeting: "Petteri should be reminded that no final decision has been made yet." The comment referred to a sentence in the pilot report Petteri had written, which stated that "large scale adoption will take place in 2007…"

tion, but as it is, so that things can be thought of in a different way. (Erk-ki)

The previous sarcastic utterance targeted at Microsoft's monopoly, is explicitly tuned down in the second sentence. However, the word "but" refers back to the initial sarcastic remark, hence making it hard to ignore open source as ideology.

Finally, the last speaker aligns himself with Linux indirectly by a reference to the Microsoft Windows operating system. His Linux preference is motivated by his need to develop his IT skills:

But the Windows-side has been dropped out, luckily…so one hasn't had to do any of that Windows stuff… because I have found it way too easy. It's not at all challenging, if I do Windows stuff. (Antti)

Half a year after the interview, the speaker reported that he was leaving his position as the organization's Thin Client expert hence jeopardizing the whole TC experiment. Whose interests are the speakers primarily furthering–their own or others? Open source software seems to enter public sector organizations via one person, the IT manager. Whether idealistic or counter-idealistic, the way IT managers discursively represent open source will reflect also their personal motivation and thus their interests to further the idea in-house. One can ask whether all "successful" implementation attempts require a dedicated open source missionary. Moreover, the discourse indicates that the use of open source on a conscious level, as ideologically embedded technology, is still limited to the technically competent user. This example indicates the power a single skilled user has on the selection and use of open source-based tools.

8.4 Discourse of the ordinary office software user

Interestingly, an ordinary office software user discourse could also be identified in the public sector actor's speech. The discourse refers to a way of speaking about the "typical" user in general, whether open source or proprietary. It was used in justifying the need felt by the IT management and the user representatives to "educate" and "overcome the resistance" of the less skilled user by means of pilot projects. Paradoxically, inscribed in this discourse was also the idea that users do not need to be informed about the differences between open source and proprietary tools, and that the purpose of a pilot may in fact be to serve as a tool for overcoming management resistance.

All the interviewed people took speech turns and made utterances, which could be understood as a distinct office software user discourse (see Table 6). People used nouns such as basic users, office workers, secretaries, clerical staff,

summer workers, new employees, general users and teachers when talking within this discourse. Examples of the indirectly observable assumptions related to the typical user are given below.

The typical office software user appears in the interviewees' speech as ignorant and in need of education:

> The attitude has been positive…the migration to OpenOffice.org has not caused any wonderment in SmartSuite users. Yes we have had some negative comments too, but in these cases it has been a question of pure ignorance. (Petteri)

> On average people don't know how to use the products (office software). I mean really. I come across it constantly. I just now cursed a report as I was correcting it. So one can see that people don't know how to use those products. (Kaarlo)

An ideal user on the other hand is passive, conformist and quiet:

> And then for new people, if we have had new employees or summer workers or suchlike for them we have given TC's. So they are the easiest clients. They take whatever tools they are given and they come from the real world…so they are more satisfied and in fact the most invisible users, they don't argue with it. They use it with content and get on with it. And then they don't have any old needs since they come in as new. (Antti)

The user is also spoken of as someone who does not need to be informed about the chosen tools, and thus the below examples can be interpreted as an implicit form of forced use:

> The users of the machine can and must be categorized. In administration work a text editor and browser are enough. In such cases open source use would be almost trivial if management dared to commit them selves to the environment. (Jukka)

> It (open source) has not been explained. (Antti)

> I would have imported OpenOffice.org–software into all TC computers and MS software out, so that people would have learned to use it…it does not matter what hardware you use. (Helena)

Further, the typical office software user appears in the interviewees' talk as someone who by definition resists and has to be overcome if one is to pursue open source in-house. Pilot projects and training were seen as the necessary means for overcoming "resistance" on part of the users. The next excerpts illustrate dilemmatic discourse between two people in MJ on the nature of the pilot:

> 150 typical users from 4 bureaus were taken into the pilot and they were given a one-day training session and the OpenOffice.org installation (or more correctly, they did the installation in the presence of an expert who gave his/her support). OpenOffice.org was in use as a normal tool during the pilot. All the questions were written down and they were used as a basis for the publication (questions and answer's manual)…(Petteri)

Klaara's version was different:

> Yes. Pilot group. Well, yeah, Petteri says about a hundred, it was not perhaps–well, now this is being taped–it was not about a hundred, but we were in that classroom, and there were people from a few bureaus, there were several of them…and I participated in a couple of them [training sessions]…in reality that is what Petteri thought when he talked about a hundred people, so he thought the whole bureau when in fact there were two persons from the bureau, and I asked Petteri that he ask how many here have really used it [OpenOffice.org]. Since there is not much writing done here. So it's not enough that you use Open Office, if you do not really do anything with it. The fact that you write on a small scrap or piece of paper does not count as using… (Klaara)

However, in a subsequent clarifying email he stated that in addition to "typical" users, there were also more knowledgeable users:

> Also some of our own IT support staff from the information technology centre participated in the training. They often have very good basic knowledge on information technology. In the beginning participation was moderate, in the end quite poor. (Petteri)

The excerpts indicate a contradictory view over user involvement in terms of the number of pilot project participants. Petteri said that it involved 150 users from all the different departments of the MJ. The official reports and the minutes of meetings confirm this view. If two volunteers from around ten different bureaus participated in the pilot, the total is twenty participants. This is only a

fifth of the numbers implied by other sources. How representative was the pilot if most of the participants (IT staff) did not even use a text editor in their daily activities?

A similar kind of contradiction was found between Turku city's open source report and its IT manager's talk. The report claimed to have done extensive testing with a "heterogeneous" user base, while the IT manager's utterance reveals ambivalence regarding the meaning of "extensive testing" and "heterogeneous":

> We did not exactly get a real test, in the sense that some basic users from some administrative person would have tried it out (Erkki)

Other contradictory themes within this discourse concerned the focus of in-house training and OpenOffice.org manuals. MJ's IT manager was in favour of a generalized approach where the whole set of OpenOffice.org applications was taught to everyone regardless of their specific work tasks. The office automation trainer on the other hand opted for a focused training scheme and an internally useful manual with the emphasis on document "styles" since they form the main requirement of the major "user group"–the secretaries of staff. The OpenOffice.org manuals however were written with a wider audience in mind:

> The manuals provide a good example of how a user organization can give back to the open source community and avoid being a free rider. (Petteri)

The dilemmatic utterances indicate how the good intention of giving back to the open source community by providing publicly available user manuals for generic users may not have necessarily advanced the special needs of MJ users. Who the user is and what it means to use would seem important issues to consider when introducing new technology into an organization (e.g. Hasu & Miettinen; 2006). The controversial utterances raise questions concerning the justification of the pilot. What was the role of the pilot in the decision making process? The steering groups' minutes indicate that the decision-making was postponed because they wanted to see the results of the pilot, thereby pointing to the importance of the pilot.

In the FMI, the importance of the pilot was indirectly mentioned. Instead of a user-initiated selection of software tools, a project-like "imposed" approach would have been preferred:

> I would have wanted that this would have happened in a more project-like manner so we would have gone systematically through all the open

source alternatives that we will take. Now we have in fact chosen those
that people (researchers) have evidently experimented and used. (Klaara)

The researchers-users seemed the only users benefiting from the Thin Client
since they had had the freedom to select their own tools based on their own
needs. However, the utterance above indicates that the user's point of view
would not be so important after all. With reference to the other non-coding-
users, one is tempted to ask whether the Thin Client was in fact open source in
disguise. Furthermore, on can ask, whose tools pilots are in technology imple-
mentation. What are pilots for? Do they serve the purposes of managers or
steering groups or potential users?

Table 7. Summary of main findings: discursive dilemmas in FLOSS adoption

Economic-technical efficiency discourse	Governance and Regulation discourse	Idealistic user discourse	Typical user discourse
FLOSS use is related to direct monetary savings or indirect production savings – FLOSS is a vehicle for maximizing 'user innovation'.	F LOSS is viewed as a neutral tool while it is simultaneously viewed and/or used as a tool for better user control.	The FLOSS idealist is a strain for high-level management, yet it is through such idealists that FLOSS gets disseminated in organizations.	The office software user in conceived as ignorant and in need of education with respect to software, while it is simultaneously wished that they would stay that way because silent users are easier to handle. The ambiguity of ICT pilot projects: a tool for including the user's point of view, or overcoming user resistance, or convinc-ing the management and the steering group? The ambiguity of the 'typical user': a generalized user or a user with specific needs?

8.5 Conclusions

This chapter set out to explore the complexity and variety of argumentation
within four Finnish public sector organizations on the topical issue of FLOSS
adoption. It explored the relation between the "global" open source community
and "local" user practices. The purpose was to see how the ideals of user inno-

vation, democracy and transparency resonated in actual user organizations. It focused on the often complex and contradictory argumentation of a spectrum of different Finnish public sector actors, interviewed on the topical issue of open source adoption (including OpenOffice.org and Linux). The starting point was the observation of the somewhat idealistic tone in favour of FLOSS within academic discourse, especially in the writings on the liberating, democratizing and empowering potential of FLOSS to the user. Instead of taking sides on the subject matter, the purpose of this analysis was to critically examine how these ideals are re-echoed in actual discursive practices. The analysis focused on public sector actors' discourse about FLOSS thus exploring the social aspects of technology use. The critical discursive approach with the emphasis on the dilemmatic aspects of social thinking and power relations enabled a more multi-faceted interpretation of FLOSS in the public sector to emerge. Moreover, close reading of the interview data allowed inferences to be made about sensitive aspects of power in ICT implementation, which could have potentially faded away unrecognised when treating a more extensive corpus of data.

The societal-level discourses identified in the literature–"better quality software faster" (Raymond, 2000), "transparency in society by means of open code" (Lessig, 1999) "user freedom and ethics" (Stallman, 2003; Benkler, 2003) and "user innovation" (von Hippel, 2005)–, indicate that there is no unitary FLOSS discourse as has been earlier suggested (Berry & Moss; 2007). Further, when these are contrasted to the identified public sector discourses, an even more complex reality unfolds. My analysis showed how people tended to simultaneously draw from and contribute to a variety of different socially embedded discourses thus making the either-or dichotomy of technical efficiency versus freedom and ethics too narrow an interpretation. Further, the values attached to FLOSS in public sector practice show that ICT management have to make decisions in a world penetrated by profoundly dilemmatic and contradictory discourses. Not only are these actors influenced by different specific societal-level FLOSS discourses; they also engage in other more general organizational ICT discourses. And it is in this *dilemmatic discursive space* where different competing rhetoric collides.

Four main discourses were identified: (1) an economic-technical efficiency discourse; (2) a governance and regulation discourse; (3) an idealistic FLOSS user discourse; and (4) an ordinary office software user discourse. The identified discourses with their distinct vocabularies and assumptions indicated a profound tension between the freedom to choose, use and develop one's desktop in the spirit of FLOSS on one hand and the quest for better and more efficient desktop control and maintenance by IT staff and users' advocates on the other. Hence, on a more general level, ICT managers have to struggle with and balance between two contradictory discourses and forces that seem to permeate the

whole society: freedom and control, change and stability. How much freedom to give the user while still remaining in charge of a high level of complexity?

The economic-technical discourse indicated traces of the pragmatic "better quality software faster"-argument. In this sense the societal-level discourse was used as a resource and successfully translated into public sector discourse. This indicates the power of numbers (e.g. Denis et. al., 2006) in the Finnish public sector ICT decision making, understandably so, since there could be millions of Euros at stake and decisions have to be made within budgetary frames.

The discourse of governance and regulation exhibits a dilemma in the way the IT staff spoke about the politics of technology in general: on the one hand it was neutral, "just a tool", and on the other, a means for better user control. Here, the view of technology as neutral can be seen as a manifestation of implicit power (Winner, 2009). On the level of discourse, FLOSS tools were not distinguished from proprietary ones: they too could be used for desktop standardization. User freedom in selecting and developing software was spoken of as problematic for maintenance. In this sense standardized FLOSS was used as a control tool in disguise: as a means for achieving better user control by attempting to reduce users' freedom to choose what programs to use and develop. Surprisingly, and contrary to the societal-level transparency by means of open code-discourse, FLOSS can be used for "hidden" control purposes by IT staff.

The discourse of the ideological FLOSS user showed how the individual preferences of the competent IT manager may influence the way FLOSS is "missioned" in-house and how FLOSS use on an ethically and morally conscious level continues to be marginal activity. The idealistic user was seen as an obstacle in assessing the needs of the ordinary users and convincing high-level management while simultaneously regarded as the necessary moving force in the infiltration of FLOSS. In this sense, the societal level freedom and ethics-discourse translated into the public sector, not as a positive value, but as a negative effect (Berry & Moss, 2007).

The discourse of the ordinary office software user showed how IT staff talked about and talked to the user when justifying their role as experts. Ordinary users were seen as a source of problems and as obstacles that have to be dealt with through e.g. pilot projects while simultaneously acknowledging the importance of meeting real "user needs". Although this study is limited in not including different "ordinary" users' points of view, it was possible to infer the existence of certain underlying power struggles from the IT professionals' and user advocates' views. The slight difference between the two groups, the IT managers and the user advocates, manifested in the way the "user needs" were portrayed. User advocates saw the user as a specific person with specific needs while the IT managers tended to see the user as a generalized other, thus complicating the definition of "user". The societal-level discourse of innovation by

users, albeit acknowledged on a rhetorical level, seems to go unnoticed in practice.

As shown in the analysis, discourses of technology can be powerful devices in sustaining power relations and "stabilizing" myths. The empowering potentials and democratic values, articulated initially by contemporary FLOSS spokesmen, quickly diffused to the academic research literature on open source. However, the critical discourse-approach with the emphasis on FLOSS as a socio-technical system, made visible the tension-laden nature of FLOSS decision making in particular, and ICT implementation more generally. The asymmetry between the layperson (the ordinary user) and the expert (IT staff) manifests itself in discourse in a way that calls for critical re-evaluation of the language used in ICT implementation and support. After all, the IT deficiencies and needs of the ordinary users are a prerequisite for the profession of the IT expert. By implicitly attempting to control the user, ICT staff makes itself indispensable or in Callon's (1986) words, an "obligatory point of passage". The fear of loosing this position could contribute to the way the IT staff spoke of the "user".

FLOSS is a contradictory phenomenon with respect to the public sector decision-making environment, its actors, and most importantly, the user. Based on the argumentation put forward by the public sector actors, I argue that a more refined and sophisticated conception of the user is needed, that is, an exact understanding of whom the actual users are. It seems that a discourse of the "real" participating end-user is missing, although research, including the participatory design approach, has encouraged the inclusion of the end-user in design processes (e.g. Whitaker, Essler & Östberg, 1991). One reason for this missing discourse may be in the way the competent ICT user, typically IT staff, "owns" technology implementation, and the language used for appraising it. The findings also indicate that the concept of user in FLOSS is radically changing and needs to be carefully re-examined.

The contradictory discourse on user involvement in pilots called attention to the role of pilots in technical decision making more generally: are they a formality and a tool for communicating with the management, a tool for overriding the user's point of view, or a tool for overcoming real user resistance by meeting real user needs? More specifically, whose tools are pilots or FLOSS tools? What does "successful implementation" mean–successful from whose point of view? These questions direct attention to the nature of artefacts in ICT. It then becomes important to consider *Whose artefacts?"* as a heuristic tool for drawing attention to the power relations and ownership of cultural artefacts including language in technology implementation. Since pilot projects and their results are extensively used in ICT implementation, it would seem valuable to examine their significance to actual user activity.

The Finnish ICT public sector discourses made visible the problematic IT staff–end-user relationship as well as the extended developer-user relationship. The authoritative positioning of the IT staff in relation to the "users"–"typical users" (office workers) and "ideological users", researchers in the meteorological institute, –indicates that IT staff can be seen as a new mediating layer in the FLOSS developer-user relationship. Further, the ideological versus typical users underline the division between developer and end user hence reinstating the developer-user gap in technology production. It also raises the question of skills and motivations: are end-users really interested and capable of participating, and how should open source take this gap into account?

Taken that FLOSS is a developing phenomenon, and that fact that the data was collected as early as 2007, public sector FLOSS and ICT discourses may have changed. However, it is precisely this that makes it even more important to pay attention to language use in technological decision making. Is there a way to break away from the contradiction of freedom and control expressed in the discourses of governance and the ordinary user? Could the user benefit from IT staff that would be sensitive to user advocates and actual users' viewpoints? Moreover, are we witnessing a problematic IT staff–user relationship more generally?

9 AUTHORING COMMUNITY: THE STRATEGIC CONSTRUCTION OF OPENOFFICE.ORG

This chapter explores an important yet understudied dimension of community life in online open source projects, namely community management through web page writings. While earlier research on open source leadership and governance has contributed to our understanding of mechanisms of collective technical decision-making (Berdou, 2007; Crowston, Wiggins & Howison, 2010; Siltala, 2011), there has been little if any studies on non-technical community management. In the OpenOffice.org project, the Community Manager constitutes the link and connecting tissue between the firm and the volunteers. Like an author of a novel, the Community Manager attempts to write the community into being and directs his texts at particular audience(s). The practice of authoring, whether intentional or not, involves a guiding hand in charge. Thus, defining the community by writing involves a strategic, reflective and imagined component. He draws from actual observed discussions as well as from open source theories as he constructs the OpenOffice.org community. This is not to say that other community members, including volunteers, would not engage in defining community on the project's mailing list discussions. Indeed they do, as was the shown in Chapter 6. The difference here is that the Community Manager is paid to do just that; by imagining a unified yet ambiguous community he articulates an "espoused theory" (Argyris & Schön, 1974) of community.

The following analysis underlines the power of written digital print in the construction of an imagined community. Hence, the exercise directs attention to the power and politics inherent in language use, specifically in the present instance, to questions of organizational image building by rhetorical means, targeted at specific audiences. This chapter draws attention to the emergence of new but underexplored managerial practices of building hybrid open source collectives by highlighting the role and centrality of texts in articulating the evolving purpose(s) and identity (ties) of the OpenOffice.org project. It also underlines the relation between changing language and the changing object of OpenOffice.org.

The task at hand is to study the manifestations and dynamics of the hybrid OpenOffice.org community through the OpenOffice.org Community Manager's written speech about its central members on the project's website during 2000-2007. The analysis starts by examining the OpenOffice.org Community Manager's use of the notion of "community" and related key membership concepts thus focusing on issues of identity and inclusion. As we will see, a central tension throughout the writings is regarding OpenOffice.org as similar to Linux

while simultaneously portraying the project as a new type of open source project. Closely related to this tension is the gradually deepening distinction between "developer" and "(end) user". Further, the Community Manager's writings show how the OpenOffice.org hybrid organization evolves and struggles in balancing between being represented as the controller or "protagonist" (Dahlander et al., 2008, p. 117) of a community on one hand, and as an equal member or the "community" on the other. Hence, a movement between the quest for control and the thriving for true collaboration is visible in the Community Manager's texts.

Because the OpenOffice.org project was too large for one person to study as a whole–tracing all 100 sub-projects and their inter-linkages in depth would be a mammoth, if not impossible, task–I sought to find a level of analysis that would somehow reflect the collective as a whole. Since the OpenOffice.org home pages act as a kind of public interface or "door" to the overall project and community, the texts on these pages reflect the developmental trajectory of the OpenOffice.org project as part of the larger societal-level change related to the software industry.

The "Wayback" machine[60] was used for gathering historical data on the evolution of the OpenOffice.org project's front page /homepage from its inception in 2000 to 2007. The Wayback-tool makes it possible to track longitudinally the development of the OpenOffice.org project web pages. Altogether 360 modifications to the front page were tracked and saved in a file. I read all 360 different updated and modified front pages, and took notes of all significant modifications to the pages from the point of view of community articulation. These included for example the way in which the purpose and definition of the project changed trough the years. The project seemed to struggle with the words "free" and "open", and "developer", "hacker" and "user" thus implying the difficulty of describing the hybrid project. However, I realized that to focus on these modifications would not suffice as empirical evidence. I had to find another corpus of data within. However, this preliminary reading provided a sense of what might repay closer study.

The hypertext links on the front page had to be examined and evaluated for their relevance to the topic of community. This led to an interesting set of data, namely the Community Manager's writings about the community to the community (see Figure 7).

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[60] See http://www.archive.org/web/web.php.
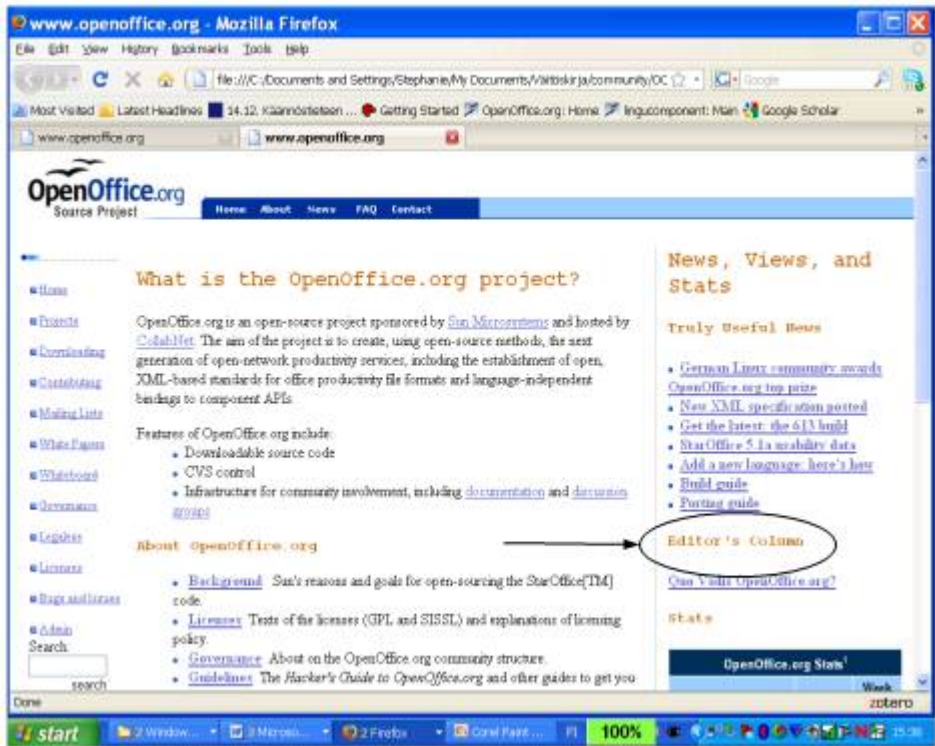
Figure 7. Finding the appropriate set of data from the OpenOffice.org web pages – the Community Manager's texts

The OpenOffice.org Community Manager was a central character in the project. He was first employed by Collabnet, the provider of the OpenOffice.org infrastructure, and later by Sun Microsystems (referred to as "Sun" in this chapter), the initiator of the project. After that he was employed by Oracle, who acquired Sun in 2010. He described his work on the latest update of the web page as follows:

> My overall title is Community Development Manager, which is shortened to "Community Manager." It's a term that includes strategy planning, project management, political and technical coordination, business development, and marketing. Plus a lot of other stuff too tedious to bear mention. Periodically, I write articles on open source and OpenOffice.org, and I present on OpenOffice.org and open source at major conferences. I am employed by Oracle.[61]

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[61] See: http://www.openoffice.org/lspintro.html.

He holds a PhD in English, and is also interested in the political economy of information. He took part or followed most English and Spanish-speaking mailing list discussions in different subprojects, and wrote articles on the projects' web pages. His task was to stay tuned to the overall project and try to keep the different parties satisfied. I am aware that the diary-like writings of a single person do not represent OpenOffice.org project co-ordination as a whole, since there are also other official governing bodies (see Chapter 5), and sub-project leaders who take care of project-specific management. However, since the Community Manager participated in the formal governing bodies of OpenOffice.org and led and co-led some sub-projects, he is bound to bring this knowledge into his reflections. Further, some one might even argue that these writings could be thought of as the writings of a peer academic. In this sense, one might argue, managing a community full time means researching the community and forming an espoused theory for others to follow. What the writings do provide, is a window into community management concerns related to the hybrid nature of the project: the articulation of the community and its raison d'être.

What was first named "Editor's column", changed to "Open Views" and then to "Community articles, opinions and interviews", after which it gradually faded away to reappear as the Community Manager's personal blog. This data set comprised 81 separate editorials, ranging from 1 to 3 pages each, amounting to a total of 260 pages. When I asked what the reason for this shift might be, he answered in an email in 2010:

> I dropped it, mostly, as community blogs took over what I was doing and did it better. That was more or less my intention all along, and until that happened, I was happy to write periodic articles. But there is no need now. That said, I still do engage in (indulge?) interviews with key members.

After two rounds of data reading a tentative word search was conducted to gain an idea of the frequency of the use of certain words that seemed to reappear and persist in the Community Manager's writings. The word "community" for example was used 500 times in the chosen texts, indicating its importance in articulating the OpenOffice.org project. "Community" is often used as a generic rhetorical "buzz word" but what is meant by it on each occasion can be determined only by examining the context of its use. Hence, the concept of community cannot be understood without reference to its central members or without a perspective of change.

A necessary step for the analysis of the community articulations was to focus on the agentive subjects in the sentences of the texts and the attributions given

to these subjects. Specifically, I scrutinized all the paragraphs in which the word "community" appeared in order to understand what was meant by it. This provided me an initial insight into the multiple meanings of "community" and the significance of relating "community" to its central community membership categories. I was also able to gain insight into the intended audiences (see Figure 8 for an example).

All the uses of the word "community" were categorized by analysing the paragraphs in which they appeared. The words "developer" and "user", and "Sun Microsystems", appeared frequently in the paragraphs in which the word "community" was used, and thus were considered the central community membership categories. Also special attention was paid to how the Community Manager used personal pronouns when including and excluding members, that is, defining the community and himself. Thus, each paragraph in which the word community and its defining central membership categories and sub-categories appeared constituted the unit of analysis. In this way it was possible to infer who the specific audiences were at each point in the texts (Park, 1982, p. 250; Hodge & Kress, 1988, p. 256). The paragraphs were then compared longitudinally to grasp the changing meaning of "community" through its changing community membership categories.

Figure 8. An example of the uses of the word 'community' and membership categories by the Community Manager on the web site in January 2001

The preliminary analysis was needed for finding a focus for subsequent analysis. The following analysis is based on the frequencies of the central community membership categories in the Community Managers' writings between 2000 and 2007. The community membership categories provide an overall picture of the changing identity of the project, which reflects a central tension in the Community Manager's writings. Traditionally open source contributors, such as those associated with the famous Linux project, were user-developers: programmers who developed software for other programming skilled peers and themselves. However, with the emergence of hybrid end-user oriented open source projects, a re-differentiation seems to have taken place: developers and users are reassigned into different categories. The historical change in the object of open source production from programmer to end-user software has given rise to a tension related to the project's identity, central in the analysed data. The focus is thus on the ways in which the central members of the community are spoken of.

Table 8. Frequency of the central community membership categories identified in the Community Manager's writings

Searched word	Late 2000–2002 34 articles	2003–2004 32 articles	2005–early 2007 15 articles	*Total frequency per 81 articles*
Developer	154	87	83	*241*
User	168	14	196	378

Non-sun / Volunteer contributors

Sun (Microsystems)	87	69	44	*156*

Sun Microsystems

As table 8 shows, the word "developer" appears quite steadily throughout the Community Manager's writings when seen in relation to the number of texts written. "Hacker" is included in the developer category. It was used only a few times and almost disappears from the vocabulary as the years go by and the number of texts diminishes, indicating a change in discourse. "User" is used throughout the texts more than the word "developer". The marked decrease in the occurrence of "user" in 2003–2004 could be due to the nature of the articles: this is the most vibrant period in which contributors, termed "developers", were interviewed by the Community Manager, although interviews as a form of inquiry had begun earlier and continued after this period. The word "end-user" as part of the "user" category is used throughout 2000–2007 with a slight increase toward the end of the project when seen in relation to the number of articles written. The reference to "Sun" decreases by half toward the end of the

examined period. These changes hint at a change in the developer-user relationship of hybrid open source: from hacker to end-user-oriented open source software production.

Words/concepts however are by no means simple and unproblematic–they should be treated as part of the larger "text" they inhabit (sentences, paragraphs and the historical context of writing). Hence, I studied the context of the writing, the word's relation to the surrounding piece of text (e.g. Shotter, 1993). For example different wordings can be used to refer to the same entity, i.e. community membership category.

Table 9. Distribution of community membership sub-categories developer and user

Main category	Subcategory	Frequency	Total sum
Developer	Hacker	14	*241*
	Professional developer	30	
	Extension developer	12	
	Sub-Project team or leader	60	
	The open source developer community	28	
	Anyone interested	56	
	Mailing list activity	41	
User	Groups of Native Language Speakers	45	*378*
	End-user	27	
	Consumer	14	
	Public Sector Organization	181	
	Anyone interested	83	
	Number of downloads	28	

Table 9 illustrates the distribution of the sub-categories of the community membership categories "developer" and "user". A microanalysis of the sentences and paragraphs in the Community Manager's writings made it possible to infer what sub-categories were included in each community membership category. As an orientation to the following analysis, Figure 9 summarizes the multiplicity of uses of the term "community" found in the analysis.

Hacker

The Open Source Developer community

Anyone interested

Professional programmer → Sun's engineer

Software Companies

Developer

Extensions developer

Project team or leader

Public Sector Organizations (Universities, Schools, Cities, Governements)

Mailing list activity

Community

Anyone interested

Groups of Native Language speakers

Public Sector Organizations (Universities, Schools, Cities, Governements)

User

End-user

Consumer

Number of dowloads and mailing list activity

'I', The Community Manager (Collabnet, Sun, ?)

Figure 9. Variety of meanings of community in the Community Manager's writings

As one can see in the figure, the word "community" can mean a variety of different things from vague and ambiguous entities to specific mailing list discussions and individuals. The word "community" can refer to different things in the same paragraph, and in different texts written at different points of time by the same person. In order to understand the changing meanings of these ambiguous words/concepts and their relation to the development of the open source production more generally, a more detailed discursive-rhetorical analysis is needed. The distinct yet problematic community membership categories that emerged from the analysis are examined from the point of view of who is included in the community and who is being recruited or influenced.

Three distinct community membership categories exemplifying the changing rhetoric on the developer-user relationship in hybrid open source were found in the Community Manager's writings: "volunteer contributors", "Sun" and "I", the Community Manager. The title of each changing membership category portrays a specific dilemma related to the hybrid nature of the project. The first dilemma deals with the changing meaning of the word "volunteer" in OpenOffice.org: the qualities, skills and motivations of the desired groups of people needed for the project. Are they "hackers", "Real-life developers", "users" or

"end-users"? The second dilemma deals with the problem of whether "Sun Microsystems/Sun engineers" belong to the community. The third community membership category "I" makes visible the Community Manager's changing self-positioning as he balances between Sun, the volunteers and himself: whose representative is he?

An important methodological issue is that although the word "category" implies stability, it is argued that categories should be viewed dynamically, internally as well as in relation to each other. Firstly, the fact that each category is dilemmatic in nature alone makes it dynamic. Secondly, studying categories historically over time breathes life into them. Thirdly, bringing the identified categories into dialogue with each other makes their boundaries porous and partly overlapping, indicating movement. These distinct, yet fuzzy and dilemmatic community categories indicate a managerial struggle concerning organizational and community boundaries and identities: who to include and who to exclude in the OpenOffice.org community. The challenge of presenting these community membership categories historically was solved by *writing the process through the categories*–first, treating each social category separately as a process, and finally comparing them as a whole. Throughout the analysis inverted commas are used when referring to the actual words used by the Community Manager in his writings.

9.1 Changing community membership categories

9.1.1 Volunteer contributors: hackers, real life developers or end Users?

As will be demonstrated, a fundamental dilemma related to this social category is advancing the image of the OpenOffice.org volunteer community as an entity devoid of a distinction between developer and user while at the same time discursively reinstating the division. "Developer", "user" and "end-user" are well-established categories in everyday discourse as well as in academic writing. But what exactly is meant by these rather ambiguous categories? Contradictory expectations and realities inhabit the problematic and vague categories of "developer" and "user", used by the Community Manager, thus highlighting a foundational problem of hybrid open source: to what extent can OpenOffice.org be called a grassroots programmer-to-programmer open source project? Throughout the Community Manager's writings OpenOffice.org is compared to "the open source movement" and the exemplar hobbyist project "Linux" while simultaneously portrayed as "a new era in the open source movement". Who is

the "developer community" when it is claimed throughout the texts[62] that people with programming skills are badly needed? How is the relationship between developer and user articulated?

From hobbyist hackers to professional software developers

Let us start with the use of the category "developer": the meanings attached to this category vary historically and in situ. In the beginning of 2001 the explicit aim of the project is to become a "developer community" or "a collaborative, global network of hackers, developers and idealists". What do these different groups mean and why are they distinguished? At this point no explanation is given for the use of these labels. However, the link to the "Hacker's guide" on the front page provides an indirect meaning of "developer":

> YOU are encouraged to become part of this new community. The success of this project depends on people like you getting involved: providing feedback, fixing bugs, making contributions, becoming a committer, and eventually (if you're up to it) becoming a well-respected core contributor.

The first, singular and plural pronoun "you" invites the reader to participate, making it feel like someone is directly addressing "me" while simultaneously designating "anyone". However, a closer look at the sentences following "you", indicate that it means a programmer following the ideal path of a Linux developer. It is important to bear this in mind because Linux is used as a reference point throughout the studied writings: the Community Manager draws on contemporary open source discourses when articulating the identity/identities of the project. Contemporary writers define hackers as hobbyist, idealist programmer-developers who join because they have a desire to solve aesthetic coding problems motivated by a personal need for working software. In these early writings developer-users (those who are simultaneously developers and users) can be seen as the primary intended audience.

Later the same year this conception of community is challenged by juxtaposing the earlier defined hacker-hobbyists developing software for programmers and so-called "real life developers" developing software for users and business purposes:

> (Developers on the mailing list) are very concerned with and interested in how the user will actually benefit from what they are doing. And it also shows that the developers are by no means blind to the commercial and

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[62] This is also a recurrent theme in all the sub-projects studied in this work.

real-world elements of the projects they work on. (Community Manager, January 2001)

A division between the "developer" ("they") and the "user" starts to emerge. The "developer" is discursively repositioned from being a hacker, the "mythical" "lonely cowboy" working in solitude for him/herself, to a commercially rooted developer developing for "the other". An explicit request "we need your contribution" is sent to the vague audience "Open Source Community" and "programmers". A search for the phrase "we need" indicating "we need programmers" yielded 49 hits across the studied texts, which itself implies that getting volunteer programmers to join "the core", is difficult. How can volunteer programmers be attracted to develop something that they do not themselves use?

> But X responded–and for this I thank him!–in a way that went straight to the heart of any Open Source project and certainly to the heart of ours: "OpenOffice.org isn't really an open-source project, and definitely not from the developer base point of view, having only one non-Sun committer. Well, this doesn't sound nice when taken on the face value. Yes, the code definitely is free, but the developer community and structures associated with that just haven't developed yet…(Community Manager, March 2001)

The above statement by Sun's developer and OpenOffice.org release manager was published by the Community Manager in one his texts. Here the previous notion of "developer community" is contested by highlighting that the majority of the "developer base" in fact comprises Sun's engineers.

In late 2001 "developer community" expands to include "users", "end-users", "anyone", "everyone", "all", "the world", "remarkable talents", which makes the notion of developer even more vague. The difference between a "user" and an "end-user" is not made explicit.

In the next excerpts "developer" seems to occupy at least two different meanings, which contradict each other:

> With the creation of the two new Whiteboard projects in the last couple of weeks, Groupware and User FAQ, the OpenOffice.org community seems to have entered into new territory. I don't know if we have attained "critical mass"--I don't know quite what that would mean--but it does seem as if the community has passed a milestone...and that's not just because the code is so vast and powerful or because the developer community (which grows increasingly large) spans the globe and includes re-

markably talents or because users, both individuals and groups, all around the world are continually expressing real interest in the software. (Community Manager, May 31 2001).

We move further away from a retail model, in which there are customers or clients who might complain about issues and there is an 'us' and 'them,' and closer to a true, Open Source model, in which everyone is involved (how impossible is this? A quest for a "we") (Community Manager, July 2001)

The interest the world shows in OpenOffice.org reflects a revolution that Sun has brilliantly captured: Communities are turning from Microsoft..among them, the city of Turku, in Finland... (Community manager, October 2001)

Who is this community? Basically, any user of OpenOffice.org, including, of course, the project leads and their team members, but also endusers. (In fact, it was Linus Torvalds' brilliant observation that in Open Source projects the distinction between a producer and consumer–between a developer and end user–vanishes, for all are committed to working on the product and project. (Community manager, December 2001)

In the first quote, the "OpenOffice.org community" seems to indicate two new projects, Groupware[63] and User FAQ (Frequently Asked Questions), both initiated to benefit the user. Then the "developer community" is equated with "remarkable talents", referring to hackers. After this, the city of Turku[64] is used as one exemplar of a "community" choosing OpenOffice.org instead of the "evil" Microsoft, used as a reference point by the Community Manager throughout his writings. The last two excerpts depict the "community" as an entity free of the division between developer and (end) user by reference to the famous Linux project. The difference between Linux and OpenOffice.org, however, is that while Linux developers are also users of the product, in this case the Operating System, OpenOffice.org developers do not necessarily use the Office application.

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[63] The Groupware project was studied in Chapter 6.

[64] The case of Turku City was studied in more depth in Chapter 8, which deals with "end-user" FLOSS in the Finnish public sector.

User-contributors and non-contributing users from different backgrounds

Just before the beginning of 2002 the idea of the Native Language Project is pursued and discussed by the Community Manager: whether such a project would result in internationalization or fragmentation. English being the dominant language of OpenOffic.org, the idea of a Native Language project is to form language groups and localization groups offering "users", "end-users" or "visitor with different languages" resources and versions of OpenOffice.org in their native language. Non-coding "users" would now be able to participate in the development of OpenOffice.org by providing contributions e.g. in the form of discourse in their native language. The Community Manager advanced that the problem of going international has its downside; different native language groups may not be able to communicate with each other, thus raising the question of a shared identity.

The next excerpt highlights how the relationship between the "user" and "developer" is redefined and how the so-called "participatory community" is extended through the Native Language projects and the Marketing project to embrace corporations and governments:

> Two key projects are the Native-Lang category (an ensemble of projects) and the Marketing Project, which have altered the way an Open Source project's technology is communicated. Because of Native-Lang, we can coordinate the way users and developers learn of OpenOffice.org and offer to new users and developers the model of a participatory community. OpenOffice.org is not just a product but a process and a relation to a product; the Native-Lang projects help to further that idea. Native-Lang works in complement with the Marketing Project, which recognizes the importance of communicating our message the form that is understood by corporations and governments. (Community Manager, November 2002)

The vague "we" and "our" in the above sample could mean anyone, but it also could refer to "I the Community Manager + other managers" since "we" is used as a distinct entity in the same sentence with "users and "developers". This could be understood as a new "managerial" community membership category distinguished from the categories of "volunteer contributors" and "Sun" (this will be elaborated later on).

Throughout 2003 and 2004–in the diminishing personal writings of the Community Manager–the nature of the OpenOffice.org community is rearticulated by re-emphasizing the (end) user point of view:

The applications are now not only robust and safe but very easy to use–gone are the days when open source meant only what geeks use. (Community Manager, January 2004)

(OpenOffice.org) is very much an end-user's application, too. It is very easy to use and with our latest release, it is even better–more features, more compatibility, more robust. There have been well in excess of 20 million downloads, at least 15 million since 1 May 2002, when we released 1.0. (Community Manager, December 2003)

By "community" I do not mean only volunteer hobbyists. Most of that community is actually composed of professionals who rightly see in OpenOffice.org business and social opportunity. (Community Manager, August 2005)

The way in which the word "hacker" ("geeks", "volunteer hobbyists") is used has radically changed. In the beginning it was used in a very positive sense, while now it seems to be something to dispense with: the audience has changed from the hacker to professional developer to user to end-user. Public sector organizations are invoked to participate as consumers, users and developers. In the earlier writings "end-user" seemed almost synonymous with "user", but here "end-user" seems to actually mean "consumer"[65]; someone who just uses but does not in any way participate in the development of the product.

When compared to earlier articulations and references to Linux, the following reflective piece of text from the end of the year 2004, illustrates the discursive shift away from OpenOffice.org as an open source hacker project like Linux to OpenOffice.org as something closer to the "real world", somewhere in between a company and professional community:

The goals of the project were those touted by advocates of OSS in 1999–2000, before the collapse of the dotcom bubble: OSS would get us to market faster and better because the open-source community of developers would be attracted to the project and devote their energies and time because they wanted to, because they had an itch to scratch. OpenOffice.org has succeeded in ways that have transcended expectations for Open Source development and brought them more in line with the new, real world of the 21st century. To be sure, a community of developers has

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[65] The reference to the number of downloads (230 million.) does in fact point to this conception.

formed; equally, the office suite OpenOffice.org has developed faster and is better because of community development. But OpenOffice.org is not like Open Source endeavors such as Linux or Apache or many others. OpenOffice.org is also sponsored by a major enterprise, which continues to lead development, and that sponsorship has affected our trajectory and successes. In summary, we have benefited by the sponsorship and have thrived by the implicit guarantee that a major corporation is backing development of the product. (Community Manager, April 2004)

In 2005–2006 the audiences are separated clearly into "developers" (programmers) and "localization" (users) and "end-users" of OpenOffice.org (also on the front page icons) with the aim to "make it better for end-users". Democracy, and Open standards as the means for achieving it, is underlined as a core value of contemporary Open Source. The problem for volunteer programmers has been accessing the technical "core" of the project due to the massive code base. Hence, a new project called "Extensions" is established with the aim of making it easier for developers to participate:

> The SDK (Sun's Developer Kit) has been further added to, as has the apparatus for extensions–all of which make it easier for developers to work on the code and contribute to the project. We've always had the capability of accepting extensions, plugins, what have you; it's just easier now... (Community manager, September 2006)

Extensions are programs that can be added to the OpenOffice.org application, but they are not part of the actual codebase. A new category "extensions developers" starts to emerge in the Community Manager's texts.

"Developers" are also articulated throughout 2000–2006 by reference to mailing list traffic. Email traffic is presented as indicative of a community by wordings such as "many community members", "developer engagement measured by mailing list posts and downloads", "community measured by downloads", "very lively discussions…animated the project's discuss-list", "as evidenced in the mailing list discussions" and as "a community that is powerfully engaged", to cite a few. Simultaneously it is emphasized that open source is more than individuals downloading source code and working on it alone. For example, in 2002 the community is articulated as 1 million "downloads" and 60000 "joiners"; in 2005 as 60 million "downloads" and 100 "language projects". In 2006 the community is equated to "350,000 registered community members and is approaching at least 50 million (and probably twice that) us-

ers[66]." The power of numbers is apparent. However, one cannot but question what community membership actually means here and what purpose the use of the notion of "community" serves.

Table 10 below summarizes the analysis of the changing uses and meanings of "volunteer contributor" through the community membership categories of "developer" and "user". The first column on the left presents the three different meanings for volunteer contributor; the second column illustrates the typically used wordings for each specific meaning; the third characterizes the change in the meaning during 2000–2007. The last column links the changes in meanings to specific events and processes in the production of open source that the Community Manager's writings refer to. In this way, the table illustrates the relation between the community membership categories extracted from the writings of the Community Manager and actual socio-historical events occurring "outside" OpenOffice.org.

Table 10. The changes in the uses of community member categories, and important events in the development of software production to which to Community Manager refers to

Variety of meanings for " volunteer contributor"	Typically used wordings	Changes in the meaning of volunteer con-tributor between 2000–2007	Events and processes in the production of software to which the writings refer to
First meaning: The Mythical user-developer	Key spokesmen: Richard Stallman", "Eric Raymond", "Linus Torvalds" Synonymic expressions: "Hackers, "Mythical hackers", "lonely cowboys", "Geeks", hobbyists, remarkable talents, "Linux developers" , volunteers Functional changes: "Individuals downloading source code and working on it alone", "people fixing bugs and submitting patches", "enough eyeballs all bugs are shallow", "gone are the days when open source meant that only geeks use it", "a community of passionate users and develop-ers"	From reference to hackers as intended audience to hackers as a past trend in open source develop-ment	The development of UNIX in the local Berkley University researcher-developer networks (1960–70) Richard Stallman , The Free Software Foundation and the GPL (1980's) The development of Linux in Internet-mediated globally distributed user-developer networks (1990's) Apache HTTP server project (1996) The free software desktop environment project 'GNOME' (1998)

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[66] OpenOffice.org Windows 2000/XP/2003/Vista users in 2010: 2,707,277. Windows users constitute the majority of OpenOffice.org "users" according to (+) statistics (should there be a source for these stats?

			Community-driven Linux distributions (Debian, Gentoo)
Second meaning: Professional Developer	Required skills: "technically oriented", "programming skilled" (Hybrid) affiliation: "non-Sun committer", Mac Developers", Netscape developers, volunteers Commercial rhetoric: "real-life developers", "commercially oriented", "the maker of the product", "developers who could form working groups, teams, team members New global membership rhetoric: "cities", "governments", "schools, "the public sector", "countries", "the world" "every curve of the globe", "the US", "here, on this side of the Atlantic", "the Western World", "the other side of the world", mailings list discussions ,	From hobbyist hackers to professional software developers in software companies and in the public sector	The emerge of hybrid firm-community open source development: Mozilla web browser project initiated by Netscape in 1998 OpenOffice.org office suite initiatied by Sun Microsystems in 2000 (acquired by Oracle in 2010) Commercially packaged Linux distributions: e.g. Fedora (Red Hat) 1993, openSUSE (Novell) 1994, Ubuntu (Canonical Ltd., 2004), and Mandriva Linux (Mandriva 2005)
Third meaning: User	Required skills: "people who actually use", "not technically oriented", Native Language speakers Synonymic expressions: "end-users", "consumers", "the user of the product", "Real users", "visitors" New global membership rhetoric: cities", "governments", "schools, "the public sector", "countries", "the world" "every curve of the globe", "the US", "here, on this side of the Atlantic", "the Western World", "the other side of the world", "number of downloads"	*From User-contributors* from different backgrounds and use contexts to *non-contributing users*	Public sector and open source The city of Munich migrates to OpenOffice.org and Linux The city of Turku is considering OpenOffice.org (cf. chapter X)

New membership rhetoric: can global players be members?

As one can see by looking at the second column in the table, the Community Manager writes about the OpenOffice.org community in a new way, which I have chosen to name "new membership rhetoric". It transcends the boundaries of the main categories of "developer" and "user" in ways that embrace the

whole world, making it a powerful tool for invoking a multitude of audiences. Typically used wordings like "the world" or "every curve of the globe" are so all-encompassing that almost anyone could be thought of as a member. But how likely is it that these incomprehensibly large social entities could make up a community predicated on trust, collaboration and shared identity. Moreover, "number of downloads" and "mailing list discussions" are also part of the new membership rhetoric, where the emphasis is not directly on people (users and developers), but on the technology that indicates their existence. The connection between downloads and an actual user is not very strong in the sense that, again, there is no much information about how people use the application they have downloaded[67]. We do not know for example whether they have downloaded, but do not use; whether they use it only for certain tasks, or whether they use it as a tool at work. The same goes to the "mailing list discussions": we do not know who discusses, who stays quiet and whose voice is being heard. However, such homogenizing words are very powerful in creating an image of a global community.

9.1.2 Sun Microsystems / Sun's engineers: part of the community or not?

This ambiguous social category exhibits a persistent boundary struggle between representing Sun as a distinct entity in control of the community on the one hand, and as an equal OpenOffice.org community member on the other. The attributes and wordings the Community Manager attaches to Sun vary in meaning. At one point Sun seems to mean the owner and dictator of the project, on another Sun Microsystems is presented as a background supporter. On other occasions it is merged into the OpenOffice.org community as a contributor. The movement between these meanings accentuates the potentially problematic relationship between the company benefitting from the project and the potential volunteers contributing. How to promote the work of the company without giving too much prominence to its existence? In other words, how to present hybrid open source so as to make it a question of true collaboration and not one of exploitation?

   The next excerpt highlights how a distinction between *Sun* and the OpenOffice.org *community* was made at the beginning of the project in late 2000 just after the launch of the code on the project's website:

   Welcome to the OpenOffice.org Source Project. OpenOffice.org is the open source project through which Sun Microsystems is releasing the

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[67] For a notable exception, see http://silvonen.wordpress.com/.

technology for the popular StarOffice(tm) productivity suite. Open-Office.org is a new project that Sun is launching and will be sponsoring and participating in going forward. We have found that Sun recognizes Open Source software is more than a license; it's about a community, and they are using the tools and expertise at CollabNet to help create, nurture, and grow a vibrant, active community around OpenOffice.org.

"Sun" is presented as an active doer and benefactor of the OpenOffice.org project. OpenOffice.org entity is discursively separated from Sun and portrayed as Sun's vehicle for developing its commercial closed product StarOffice; OpenOffice.org is defined through reference to Sun. However, the use of the indefinite article "a" in front of the word "community" in this context indicates that a community has yet to be formed; Sun's desire and vision is to build such an entity. However, in contradiction, the plural "we" points to some other entity than Sun and "they" to Collabnet, leaving the signified partly open. In this sense "we" seems to indicate that a community exists somewhere. The use of the plural and vague "we" could make joining the project more appealing to a reader considering whether to do so or not. This segment of text exemplifies Sun's dilemmatic relation to the "community", which itself at this point is unclear: how to represent Sun in relation to the potential volunteer collective?

In later writings in 2001, the Community Manager specifies the vague entity called "Sun" to mean "Sun's engineers". Sun as an actor is distanced from the project. Sun's engineers are presented as a distinct social category, "the core", to which programmers or "contributors from outside the current team and outside Sun" are invited to join. At his point the knowledge of the huge code base resides with Sun's engineers, some of who have been tinkering with the same code base (known as StarOffice) from the very beginning when the German company StarDivision first owned it. These engineers also work with the latest version of Sun's StarOffice, which utilizes the code developed in the OpenOfficr.org project. The word "core" points to the technical core of OpenOffice.org code, thus indicating that Sun's engineers are part of the OpenOffice.org community. Further, the OpenOffice.org "discuss" mailing list"–the only general mailing list at the time, also used by Sun's engineers–is often equated with "community". Since these identifications are in contradiction to the earlier articulation of Sun's engineers as a distinct entity belonging to Sun, the boundary between Sun, Sun's developers and community remains unclear.

In late 2001 Sun reappears as a more vague entity in the Community Manager's writings. He underlines that Sun is contributing extraordinary amount of time and energy into guiding the community thus seeking to reassure doubters that the project has not gone astray, and seeking to affirm that there is indeed a

distinct and an active community out there. This resonates with some contemporary criticisms by open source advocates in the media about the nature of the OpeOffice.org project, whether it is a "real" open source project owned by volunteer developers or one owned by Sun and its engineers. As one can see from the wordings used to refer to Sun in Table 11 the question of ownership is by no means clear.

In 2002–2003 the distinction between volunteers and Sun is re-instantiated and Sun's power over the project and product is downplayed. It is emphasized that the project is "a community project" since "we have reduced the number of paid managers both on CollabNet's side and Sun's". The writings are increasingly in the passive voice or we-mode where the editorial "I" and "Sun" are not so visible. The discursive category "Sun" has a rather low frequency in the writings. Sun is discursively distanced from the project by presenting "OpenOffice.org*" as an active doer, an entity in its own right:

> OpenOffice.org needs your participation. Yes, we are big and getting bigger. And yes, the code now works. But this last year, for all our successes, has only been a start. What we need now is to establish clear resources that will allow users of whatever background to build the project efficiently and take it to the world. (Community Manager, November 2001)

What does OpenOffice.org mean here? The use of the first person possessive pronoun *"your"* can refer to the volunteers already engaged in the project or potential readers /contributors–"users of whatever background". The first person plural "we" (and possessive "our"), can be interpreted in an exclusive manner, others and me minus you, or inclusively, you plus me and others. "We" can also mean me, the manager, plus Sun or me the manager, Sun and volunteers.

Throughout the first three years when writing about Sun (or other categories as a matter of fact), the Community Manager compares Sun to Microsoft, who is presented as the bad "other": the enemy and commercial competitor–the one outside the "open source world". In doing so, Sun as an entity is included in the larger open source movement. However, the use of wording like "Sun/OSS collaboration" draws distinction between Sun and the Open Source Software community thus indicating a rather different viewpoint. The next excerpt highlights this distinction:

> For the 11 languages, Sun will continue to pay for contractors, and their work will be reviewed and added to by the communities. No one is taking advantage of anyone else; there is no corporate exploitation. The idea is

to be truly collaborative and to prevent confusion and duplication of effort. (Community Manager, September 2005).

The fact that it is deemed important to underline and tout the collaborative nature of Sun and the volunteer community itself indicates that the "true" nature of this collaboration has been questioned by some instance.

Table 11 summarizes the different uses of community membership category "Sun Microsystems". The phases are partially overlapping. After the year 2004 Sun as a membership category is scarcely used.

Table 11. Variety of definitions for "Sun Microsystems" and related expressions in different time periods

The strategic player 2000–2001	The core developer 2000–2004	The collaborative partner 2001–2004
Sun's OOO", "Sun's entry into the open source movement", "The company open sourcing its property", "the sponsor", "Its' Open Source venture", "dialectic strategy", "a dialectic relation with the governing body", "a sign of corporate reach"	"The OpenOffice.org Sun core team", "paid developers", "Core work", Sun's engineers, "Sun's developers from Germany and the San Francisco Bay area"	"A hosting company", "the corporate backer", "Collaborative Community", "A communal and collaborative enterprise", "the Sun/OSS collaboration", "the dialectic relation with the community members", "Sun (in conjunction with others)" , "the contributor", Sun's bold offerings to community

New corporate rhetoric: from strategist and core developer to collaborative partner

In Table 11 we can see the emergence of a new corporate rhetoric, a new way of speaking about corporate involvement in open source. Through the establishment and development of the OpenOffice.org project, Sun is discursively positioned and repositioned first as a strategist and a core developer, and later, as a collaborative partner. The typically used wordings for Sun as a collaborative partner emphasize the ideal of community and collectivism while simultaneously differentiate between the corporate and the community by the use of the word "dialectic". The Community Manager defines dialectic as a two-way dynamic relationship between two independent and mutually dependent entities by saying that "the desires of each are not identical but can only be realized together". The dilemma here seems to be that whilst Sun is presented as the "core developer" and "contributor" within the community, it is simultaneously presented as a distinct entity, separated from the community. Such ambiguity leaves room for interpretation depending on the audience invoked and the

persuasive purposes of the writer (Eisenberg, 1988). For example, the rhetorical use of Sun as a collaborative partner may be used because the community or some other instance questions the very collaborative nature of the project. Sun as the core developer may be used to reassure about sustainable development, or to make a point of Sun as a community member to win over more support. Sun as the strategist may be used against Microsoft or help building an image of the company as a forerunner in the software industry.

9.1.3 The Community Manager: whose representative?

As the earlier community categories indicated, the Community Manager's texts reflect his complex position, first as Collabnet's employee, and later as Sun's employee; both as an OpenOffice.org "community" member; and as a distinct individual representing himself. Wordings like the personal pronouns "I", "Me", "My", "We", and other subject positions such as "Editor", "Collabnet", "Sun", "spokesmen like me", "a mediator", "Community Council", "Manager", "User", "in between Sun and the community", "leader, "a managerial and technical infrastructure", "a novel managerial approach" and "an Open Source advocate", are used by the Community Manager in situating himself within the OpenOffice.org "community". The multiple positions adopted linguistically by the manager show how managerial identity is constructed, deconstructed, and reconstructed.

Further, the changing titles of the Community Manager's writings echo the reflective and strategic nature of managerial authoring. The next excerpt shows how the personal pronoun "I" and "my" are used strategically to make it clear that the Community Manager is responsible for the views presented. The Editorial "I" is separated from "Sun" to better position the Community Manager as a mediator. Also visible in the next two excerpts is the contradiction between claiming not to know what the community's views are and then claiming to know those views:

> I'd like to clarify the purpose of the Editor's Column. The articles that comprise "Editor's Column" do not seek to represent Sun's view, and I don't know about OpenOffice.org's views, as it's not clear that one can easily synthesize the disparate views of an open-source community as such into something coherent enough to fit into a column. Rather, the purpose of the column is to focus on issues that the community has found interesting, as evidenced by discussions in the mailing lists, or might find interesting, because they relate to Open Source, its communities, and important spokespeople. (Community manager, February 2001)

Calling these articles "Editor's Column," has been, I realize, a mistake. My suspicion is that by using the word "Editor," I have left the unfortunate impression that these are editorials. They are not. As I stated *earlier*, my intention in these columns is to provide the community with news, views, and positions it might find of interest. eg. "when I learned of *Sun's decision* to hand over further development of the port to the Open Source community, specifically OpenOffice.org, my feelings were mixed. (Community Manager, March 2001)

Soon after, the name of the column was changed from "Editor's column" to "Open views". As one can see, the choice of the title for the column is not irrelevant. The change emphasizes a shift from the rhetoric of a top-down process to one of a bottom-up open participatory process. The change in rhetoric can be seen as a vehicle both for encouraging people to participate as well as for creating an image of OpenOffice.org as an "open" open source project. Moreover, in the last sentence using the pronouns "I" and "my" indicates detachment from "Sun".

In the beginning of the project the Community Manager reassures the reader that there is "a dialectic relation between the community and the formal governing body while simultaneously stating that no such formal body exits[68]:

Last week, I *suggested* that an open-source community exists in dialectic relation with the governing body (or whatever body articulates the rules and road maps). But the nature of a dialectic is that it is not static: power shifts incessantly, the goals of any open-source community never purely rest with the governing body but can always be contested by an active community. However, the OpenOffice.org community is not quite in the same situation as, say, *Mozilla.org*, on which I briefly touched last week. Rather, as Brian Behlendorf (co-founder of Apache) wrote in response to a message, "there are no 'OpenOffice[.org] Foundation board members' yet; Sun (in conjunction with others) is still working to determine the best way to create a legal entity around OpenOffice.org that answers to the community." This is not to say that there is no guidance or planning. There is: Sun and CollabNet (who hosts the site) continue to devote an extraordinary amount of time and energy to guiding the community. It is just that there is so far no formal governing body. (Community Manager, March 2001)

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[68] The "community" at the time comprised 30 people participating in the mailing list discussion.

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As a response to the Apache-project's founder's comment, we can see how the Community Manager moves between "I", the unique person referring to his own words by reframing his message, and as a representative of Sun Microsystems and Collabnet by justifying the non-existence of a formal governing body while simultaneously reassuring the reader that work towards this is being done. At this point the "dialectical relation" seems to be wishful thinking and an act of managerial justification:

> Open Source is more than a culture: it is a dialectical strategy by which developers are given enormous power and opportunity that requires a novel managerial approach. (Community Manager, February 2001)

The "novel managerial approach" can refer to himself or to Sun. The next excerpt from around the same period shows the justification of leadership via a personal-ideological stance toward Microsoft:

> Microsoft's conception of a community without a leader-a confused, anarchic group-will only reduce to chaos any enterprise…. This conception is laughable… From Microsoft's perspective, a community is a more or less a passive thing, not unlike a Hollywood audience, eager to buy more, however stupidly.... This conception is of course absolutely contrary to Open Source, which conceives of the community as actively engaged in constructing the software (Community Manager, May 2001)

The next excerpt four years later illustrates a change in the Community Manager's use of language in positioning himself from a "manager" to a "spokesperson". Contradictory to his earlier statement about the necessity of leadership, he underlines the so-called self-organizing nature (independence and initiative of self-selecting volunteers) of open source projects in contrast to the companies:

> Keep in mind that an Open Source project is not like a company, where the executive allocates resources (employees) and something is done by executive will (employees work on what he or she wants). It is a bazaar, where individuals, groups, act on the basis of their own desires and abilities. Things can be stated as being important and really desirable-but who states them? The community of users and developers, though there may be spokespeople, such as myself, who articulate community desires. And who will end up doing them? The developers, working with all other contributors...(Community manager, April, 2004)

The use of "we" in the next excerpt refers to OpeOffice.org management since we includes "I" the Community Manager. "Developers" ("you") is presented as a distinct category:

> Last year we heard, clearly and loudly, that a major shortcoming of the project was that it was notoriously difficult for developers to work on the code and get their patches accepted. We heard you (Community Manager, September 2006).

In 2006 the Community Manager gradually distances himself from the texts, and only writes so called birthday reports. In addition to the multiple affiliation-related positions depicted above, the *author-manager* also takes the reader through different genres of writing. As exemplified earlier, at the beginning of the project in 2000–2001 he wrote so-called "Editorial columns", then renamed these "Open views" and later "Community Articles: Opinions, Interviews and Analyses". The writings in 2003–2004 were mostly interviews with key project contributors, occasional analyses of the OpenOffice.org project and conference reports. The interviews concerned issues from personal motivation to project organization and recruiting. These interviews portrayed the community mainly as a small team of contributors working on a specific problem. The columns were more in a passive or we-mode where the editorial "I" and "Sun" were less visible: editorial power was given to contributors. 2005–2007 comprised a diminishing collection of texts–editorial analyses, interviews and conference reports–finally reappearing as his personal Blog[69], hypertext-linked on the OpenOffice.org website. This remediation illustrates the dynamic nature of managing and the intertwining of the social and the technological: new technologies can open up new use possibilities for managing communities; blogs as personal diaries can be used for organizational purposes as well. It also exhibits the multiple writer positions adopted by the Community Manager in the course of authoring community: Editor, Reporter, Interviewer, Analyst and Blogger, to name a few.

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[69] The Blog is named "ooo-speak: Mostly on OpenOffice.org, FOSS, and everything else". This corpus of data has not been analysed here because it is not directly linked to the OpenOffice.org project and because it would have been too laborious a task in addition to what has been already been analysed here.

9.2 Conclusions

This chapter approached "community" from the point of view of the Community Manager. It analysed the Community Manager's use of the word '"community" and related membership categories that appeared in his writing on the project's web pages during a period of seven years. The changing community membership categories showed how the meaning of "community" moved between vague and powerful all-encompassing definitions comprising the whole world to precise articulations of individuals and groups. The variety of meanings and reference groups attached to the notion of "community" showed how complex and fuzzy the community is, including the community itself.

In fact, the word "community" is used both for speaking about the unknown or desired as well as the known actual communicating people. In this sense the changing community membership categories provide a historical account of the Community Manager's changing "object of activity" (Leontjev, 1978; Engeström, 1987). Further, it seems that the use of the word "community" serves the purposes of both creating an image of a homogenous collaborative entity predicated on trust and familiarity as well as enabling a view of a heterogeneous ensemble of people belonging to a multitude of smaller sub-communities.

The findings imply that the word "community" can be seen as a strategic resource for orienting toward multiple goals and appealing to multiple real and imagined audiences, from hackers, professional developers, advanced users and non-contributing end-users to the whole world. Indeed, in these texts, the Finnish public sector was also included in the notion of community. When contrasted with the previous three empirical analyses (chapters 6,7 & 8), a slightly different picture emerges: a community that is in fact very dispersed. As the case of the Finnish public sector discourses for example showed, no direct link to the "global OpenOffice.org community" could be found.

The Community Manager's texts can be seen as a new managerial tool for reflecting on the nature of the OpenOffice.org project. The nature of these web-texts can be thought of as more intentional and reflective than oral ad hoc communication. It is therefore necessary to understand that this activity is strategic in nature and that a central skill in the management of online communities concerns *writing*. While articulating the community to a multitude of audiences, the Community Manager also articulated himself: who he is as the Community Manager and in what ways he is needed. The Community Manager's ambivalent and ambiguous position in the community manifested through his texts. On the one hand, the one-way communication of the webpage texts allowed him authority over defining the community. On the other, not knowing who the actual readers are could in fact turn the authorial position into an

imaginary one. Either way, the texts provided him with a space for managerial identity work.

In this sense managers can be seen as rhetorical beings arguing with themselves and others (Cunliffe, 2001, p. 361). Hence, also in the open source communities, managerial authoring a takes place. This strategic aspect has not been highlighted in the open source literature on community building thus far. However, it has to be noted that the activity described here is only a part of what the Community Manager does.

The findings indicate that "community" is a constantly evolving concept, demanding sense making also by managers. Hence, it can be argued that there is no community as such without someone articulating it. It could be maintained that keeping a community alive requires that someone articulate it on a regular basis. In contrast to the idealistic notion of a self-organizing bazaar (cf. Raymond, 1999), I propose that the management of online hybrid open source be seen as involving also a dynamic strategic practice of *authoring community.*

If OpenOffice.org is thought of as a global world community, as indicated by the Community Manager in his texts, what would this mean in terms of social categorization and membership: does "the world" fit the notion community membership? Is the word "community" an apt term for talking about a loosely connected or non-connected ensemble of people? The "new global membership rhetoric" of the Community Manager highlights the ambiguity, and hence the strategic power of the concept of community. One cannot but ponder whether the rather abstract notion of community has suffered from inflation with the emergence of the new global membership rhetoric, as evidenced in the analysis. Can there be a shared identity between people who do not speak the same language? Is communication/common language a prerequisite for a "community"?

All in all, due to its ambiguity, the concept (global) "community" can be seen as a strategic resource for orienting toward multiple goals and appealing to multiple real and imagined audiences, which is why it is useful to study its changing use and meanings (Eisenberg, 1984; Skinner, 2006). Further, the tension-laden, changing community membership categories presented in this chapter evolved around the developer-user relationship, indicating a change in open source production. As the global hybrid rhetoric found through the analysis indicated, Sun's role and position in the project changed from strategist to core developer to collaborative partner depending on the audience that was being addressed. The dynamics of hybrid open source was enacted through the simultaneous inclusion and exclusion of Sun in the community leaving the relationship open. The analysis made visible the dilemma of whether OpenOffice.org is a prototype open source project or whether it represents a new era in open source development.

10 DISCUSSION AND CONCLUSIONS

By reframing common and axiomatic knowledge on the open development model of FLOSS, this study contributes to the theoretical discussion of "communities" in general and "virtual communities" more specifically. The investigation sought to understand how the changing structure and membership constellation of the hybrid OpenOffice.org community, specifically the relation between volunteers and the sponsoring company and the relation between developers and users, has been linguistically constructed. Furthermore, it attempted to find ways to characterize and define internet-mediated "virtual" communities and to understand how they differ from hierarchical forms of knowledge production on the one hand, and traditional face-to-face communities on the other. The purpose of this chapter is to redeem these promises by re-examining these issues in the light of the results of this study and consider what conclusions can reasonably be drawn.

Answers to the specific research questions have already been given in each empirical chapter. Therefore I will first briefly summarize the empirical findings (section 10.1). Second, I discuss the changing developer-user relationship in hybrid open source by drawing some overall conclusions that cut across the analyses (section 10.2). Finally, I discuss what contribution of my research results and conclusions make to the methodological and theoretical discussion of the concept of "community" (section 10.3.)

10.1 Summary of empirical results

Chapter 6 on the OpenOffice.org Groupware community concluded that Sun Microsystems and volunteers failed in their aim of collaboration in the OpenOffice.org Groupware project. Despite the enthusiastic idea-generating users and potential testers on the mailing list, collaboration between the firm and volunteers was not possible without both the firm's source code and the volunteer programmers–both of which were necessary for the realization of open development. The failure to form a "collaborative community" (Adler, 2006), and the compromising of openness and transparency in decision-making processes, led the "hybrid community" to split into two: the volunteers "we" and the firm "them". As the contra-positioning analysis showed, the community boundaries became clearly established by linguistic means. The project ceased to exist because sufficient dialogue between the volunteers and the firm was not established.

Chapter 7 on the motivations of volunteer contributors concluded that their unique patterns of motivations were tied to changing objects and personal histories prior to and during participation in the OpenOffice.org Lingucomponent project. The motivations indicated that the boundaries between work and hobby are blurred and shifting. Rather than seeing volunteers in open source language technology development as a unified community, they can be better understood as *independent entrepreneurs*, with *mobile membership*, in search of a collaborative community. The concept of a "volunteer" in open source language technology development can be questioned.

Chapter 8 on the selection of FLOSS tools concluded that the decision making and implementation discourses regarding open source of the Finnish public sector ICT organizations were profoundly contradictory. The interviewees' speech indicated a tension between the freedom to choose, use and develop one's desktop in the spirit of open source on the one hand, and the striving for better desktop control and maintenance by IT staff and user advocates on the other. It is argued that the link between the "global OpenOffice.org" and local end-user practices are very weak and mediated by a problematic IT staff–(end) user relationship. The findings call for critical evaluation of language use in ICT decision-making, especially language concerning the user.

Chapter 9 on the Community Manager's changing community membership categories concluded that *authoring community* could be seen as a new hybrid open source community-type of managerial practice. The analysis showed how complex and multi-layered the OpenOffice.org community was, and how contradictory the Community Manager's position between the firm and the volunteers was. In addition, and in contrast, to the idea of self-selective and self-organizing open source community (e.g. Raymond, 2000; Crowston & Howison, 2005), it is argued that to continue to exist, the hybrid open source community also requires that it be articulated on a regular basis. Hence, also communities too can be authored. Based on the analysis of the changing community membership categories, it is maintained that due to its ambiguity, the word "community" can be a powerful tool for building a sense of a common purpose. The Community Manager's *new global membership rhetoric* and *the new corporate rhetoric* can be seen as strategic resources for orienting towards multiple audiences.

The empirical chapters approached the problem of "community" from four complementary perspectives and from complementary angles, tools of analysis and sets of data. Together, these reflected the temporal sediment of the research process. Given that the open source phenomenon is a rapidly evolving phenomenon, it has been a research challenge to stay aboard and get work published with as little delay as possible. Although the data of this study might now seem out-dated, the microanalysis and the results are longer lasting. In fact, it can be

argued that any new hybrid open source community will face challenges and issues of the kind described in the empirical chapters: how to keep the process open and transparent, how to recruit and motivate individuals, how to present the "community" so it appeals to outsiders and potential newcomers. The findings may also be of interest and of practical value for community management in online projects.

While clearly I am unable to predict what the consequences of the texts are, either for the readers or for the Community Manager himself, "authoring power", like "community", is simultaneously real and imaginary: it is realized in the relation between the writer and the reader. Further, it should be noted that when discussing the OpenOffice.org community, I was referring to the activities of its two sub-projects and the Community Manager's authoring practice. In the present case, the Finnish public sector meant key-actors from four organizations only. It is, of course, possible, if not likely, that a somewhat different picture might emerge if some other sub-projects or public sector organizations were to be studied; however, some generalizations can be offered and discussed.

10.2 Changing developer-user relationships in hybrid open source

The claim that open source development erases the problem of the user-developer relationship in technology development (e.g. von Hippel, 2005; Tapscott & Williams, 2007) is not so straightforward when considered in the light of the hybrid OpenOffice.org community and public sector end-user organizations studied in this book. The contemporary open source discourses are indeed dynamic and contradictory. The analyses showed the multiple meanings of "developer" and "user" in hybrid open source communities, and in so doing illuminated the changing relations of technology production and use in the open development model. The assumption that the developer is simultaneously the user (e.g. Raymond, 1999; Weber, 2006) no longer seems valid.

Instead we seem to be witnessing a movement from hacker ethic and bazaar governance to more professionally and strategically regulated open source communities. This movement, however, does not mean that hacker projects are a thing of the past and that people do not engage passionately and for fun in their work. It is just that in reality the situation is far more complex and the open development model seems to have branched into multiple directions. Also, what needs to be emphasized on the basis of the Lingucomponent and the Groupware projects is the, often-neglected, issue that *open development is not collaborative from the start*. Collaboration starts only after an individual or small group of individuals have produced something that can be used and tested. As Raymond (1999) has stated, for the Delphi effect or principle of

localized variety to work properly, working code is needed for others to engage in the development process.

Indeed, even the core-periphery distinction associated with open source development seems too crude (Moon & Sproull, 2000). The core-periphery division tends to reinforce the assumption that power lies in the centre (Berdou, 2007). In light of Crowston & Howison's (2005) four-layer structure of open source communities–core developers, co-developers, active users who contribute and a large pool of passive users who do not contribute–we see an even more complex and dynamic structure unfolding. On the basis of my empirical studies, I have distinguished between *six different user categories:* 1) the Groupware project's idea-generating user, 2) the Lingucomponent's independent plug-in and extensions tool provider, 3) the Community Manager, 4) the typical office software user, 5) the ideological researcher-user and 6) IT staff. My analysis specifies and brings additional content to Crowston & Howison's structure. The idea-generating user and the independent plug-in and extensions tool provider could be perhaps seen as co-developers. However, in Crowston & Howison's four-layered structure, users are divided into active and passive groups, and co-developers are not users. In contrast, in my study, Groupware idea-generating users can be regarded as co-developers. This raises the question of whether passive users can be seen as "community" members at all. Furthermore, I would add IT staff and the Community Manager to the four-layer structure. These new layers in the developer-user relationship could be described, following Stewart and Hyysalo (2008, p. 296), as new "innovation intermediaries categories of "producer" and "consumer" or "developer" and "user"", and who mediate the use-supply axis, creating spaces and opportunities for technology adoption (p. 296).

Clearly, the idea-generating users were not users in the practical sense of being able to test programs in practice. Their contribution was discursive in nature. Rather, they imagined themselves as needing certain features in the future and hence remained only potential users. One is tempted to ask when does a user actually become a user–before, while or after using the technology? The independent or plug-in tool providers were simultaneously volunteers and professionals, thus transcending the categories "developer", "user" and "volunteer". The problematic IT staff–end-user relationship as well as the extended developer-user relationship was visible in the public sector. The IT staff mediated the user-developer relationship by authoritatively positioning themselves in relation to both the (end) users–typical users (office workers) and ideological users (researchers in the meteorological institute). The problematic IT staff–end-user relationship raises the question of skills and motivations. Are end-users really both interested in, and capable of, participating, and how should open source take this gap into account? The Community Manager's community

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membership categorization activity shows how central to the community the ambiguous and changing categories of developer and user were. The editorial "I" of the Community Manager added yet another membership category which did not fit neatly into the core-periphery relation of the bazaar model since he was not a core-developer.

As the cases studied here have proven, the categories of "developer", "user" and "volunteer" in open source are internally changing, thus reflecting a change in the conceptual system of open source. One may even ask whether we are witnessing a return to the developer-user paradox, in which different interests collide. As Farr (1989, p. 28) has proposed, it is important to acknowledge, that when "practices are constituted by concepts, we remind ourselves how very much language is "in" the political world and how decisive this is for our understanding of it". Hence, it could be argued that the changing categories and related vocabularies–the conceptual system of hybrid open source–reflects the community that uses it, and simultaneously contributes to its re-construction and redefinition. I argue that the concept of "user" in open source is radically changing: it seems that "user" represents a kind of middle category between "developer" and "end-user", pointing to a technically capable, advanced user contributing by generating ideas and/or by providing translations in their native language. We can ask whether the concept of lead user (von Hippel, 2005) "fits" these categories.

In sum, based on the empirical findings of my study, four kinds of dynamics in the discourse concerning open source communities can be distinguished:

1. A movement from communities characterized by hacker ethic principles to the professionalism of volunteers and the participation of firm's representatives and developers,
2. a movement from community members characterized as user-developers and module maintainers to a variety of users such as idea-generating users, independent plug-in and extension tool providers, typical (end) users and ideological researcher-users, as well as mediating IT staff and management,
3. a movement from self-organizing bazaar governance to a combination of volunteer-based participation and self-selection of tasks, and the work of professional project leaders,
4. a movement from a community characterized by the values of user freedom, empowerment and transparency to: a) a compromise between openness and hierarchical decision making processes, such as became visible in the Groupware project, and to b) a tension between the user's freedom to choose software on one hand and the striving for better

desktop control and maintenance by public sector IT staff and user advocates on the other.

10.3 Contribution to the methodological and theoretical discussion of community

Online-communities with blurred boundaries fundamentally disrupt "traditional" bounded, stable and physically place-based ethnographic research characterized by enduring, interactive and holistic participation in the lives of the people under study (Newman, 1998, p. 259). It has been questioned whether Internet-discussion groups can be even called "communities" in the first place (Hine, 2008, p. 259). I argue that they can and should since the Internet is so much a part of people's daily lives, and to a growing extent *an important medium for professional development*. Obviously, Internet communities differ from place-based communities (Brint, 2007), and researchers of social media should be aware that accounts of online communities are necessarily partial (Hine, 2001, p. 8). The perspectives on community that I have proposed are not then all-encompassing truths about life in the target community, but more like glimpses of momentarily exposed forms of community; in other words, they are partial truths (Newman, 2001). Indeed, the challenge of doing ethnography on and about and through the Internet is to explore the making of boundaries, especially between the "virtual" and the "real", between online and off-line (pp. 64–65), and also locating the site(s) (Hine, 2001; Newman, 1998).

With regard to the discursive-rhetorical approach used and further developed in this study, the intriguing question is whether this investigation could be called an *online ethnography of texts and writing*. This is in line with Hine's (2001, p. 50) idea that:

> We tend not to see texts as transparent carriers of meaning intended by their authors… Using the Internet then becomes a process of reading and writing texts, and the ethnographer's job is to develop an understanding of the meanings, which underlie and are enacted through these textual practices.

In the present study, it could be argued that the "online ethnographic object" of the researcher was a variety of community-produced texts, understood as historically evolving cultural artefacts. Does the non-participant observation of mailing lists for lengthy periods, and tracing and following community members' participation paths on the Internet, count as any kind of ethnography? One of the characteristics of ethnographic research is that being in the field and observing one thing leads to questions about another thing (e.g. Hine, 2008, 259). The

evolution of this study demonstrated this quality since the element of change was present in both the texts and the analyses. The online and offline texts came in different genres and complemented each other: mailing list discussions, anonymous and authored web-page writings, diary-like blogs, and researcher-initiated email and phone interviews[70], and the researcher's reflections on entering the field. The textual and asynchronic nature of Internet research also demanded *sensitivity and patience* with regard to "doing things with words" (Austin, 1962), that is, being in contact with the field through the act of writing.

The discursive-rhetorical approach developed here is particularly well suited for studying texts and writing. The methodological tool-kit or "theory-methods package" (Clarke & Leigh Star 2007; Fujimura 1992) developed and utilized here could be used more generally for analysing membership and contributor participation in other open source projects, Internet-mediated peer-production collectives, and even communities in general. The data, methods and theory triangulation (Denzin & Lincoln, 1994, p.73) provided a rich and versatile research design for understanding the large and complex OpenOffice.org hybrid community.

In the present case, community became visible through discourse. The Open-Office.org community could be seen simultaneously as a way of communicating community and a way of organizing an evolving structure for its development: hierarchies and structures (relations of power) were created through discursive acts. I propose that *discursive action* can be seen as a specific type of online community engagement. The community manifested itself in multiple ways: emotionally motivationally, professionally, practically, politically, rhetorically and strategically: the community had multiple dimensions and it was simultaneously real and imagined.

On a more general level, this study showed that communities are searched, contested, constructed, authored, broken, rebuilt and sometimes even lost. In essence, the problems of boundaries, motivation, image building and recruiting–community management issues–are problems any community could potentially face. In order to be alive, Internet communities need dialogue. Since the issue of power was not present in the community concepts utilized, I would like to propose the idea of *community authorship* as a way of highlighting power relations in communities: who can, is willing and motivated, and has the skills and power to participate?

With respect to the different concepts of community used here, it must be noted that each one was useful and that none of them alone would have provided sufficient sensitivity for interpreting the empirical data. However, in order

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[70] Code building can also be thought of as a distinct discourse genre. However, due to the lack of code contributions in the studied sites, this form of text was not analysed.

to make empirical use of the concept of "collaborative community", I needed the concept of "communities of practice" in order to render the boundaries visible and the concept "object-oriented activity" to see what was hidden, missing or scattered within the community. Moreover, the concept of a "collaborative community", with trust and openness as its core values, are clearly ideal states that are rarely achieved in real life, as my studies showed. The "collaborative community" simultaneously subsumes high individualism and high collectivism. Although the findings point to this, the "collectivism aspect" remained more imagined or more like a state to be achieved.

Initially, inspired by the studies of Ratto (2003) and Tuomi (2004), my goal was to study the construction of the OpenOffice.org code by volunteer contributors. However, it turned out that the volunteers in the target OpenOffice.org sub-projects did not substantially contribute to code construction. In studying the motivations of volunteers (chapter 7), I started with the assumption that a shared object of activity (i.e. code base) could be found. However, I quickly realized that the volunteers' contributions and motives either lacked connection or were very loosely connected to the overall OpenOffice.org product. Hence, the object of activity was not helpful in trying to understand the motivations of the volunteer participants. The volunteers' discussions on the mailing lists dealt primarily with the problem of community, probing such issues as identity, project ownership and volunteer programmer recruitment. I used "the object of activity" for understanding larger historical changes in open source activities (Figure 1). The notion of the "runaway-object" (Engeström, 2008) is appealing when interpreted in the light of the recent vicissitudes of the OpenOffice.org project (see Epilogue). The concept also provides a fruitful way of characterizing the relationship between the concept of "community" and "object". Shifting the focus from "object" to "community" and paraphrasing Engeström (2008), I propose that the OpenOffice.org project studied in this book could be better characterized as a *runaway community.*

"Communities of practice" can be critiqued for its one-way structure of periphery to core because there were many more participatory layers in between. Legitimate peripheral participation usually proceeds from periphery to core; in the present case, however, some people stayed on the periphery and some will start from the core. Also the idea of mastering skills gradually by socialization is problematic since newcomers are forced to find out for themselves, as pointed out by Takhteyev (2009b), or they are altogether neglected on the mailing lists, as one of my studies showed. The fact that one can be a skilled old timer in one community and simultaneously a peripheral member in another is in contrast with the idea of legitimate peripheral participation (Lave & Wenger, 1991) and the core-periphery distinction evident in open source. It could be argued the core-periphery distinction in mobile and multimembership open source com-

munities is in fact a dynamic two-way relation. The concept of "imagined community" on other hand was a prerequisite for coming up with the idea of community authorship because it guided me to thinking about the intended audience(s) of web-page writings in general. However, what was missing in the community concepts that I drew on, and what I have hopefully managed to elaborate, is that the construction process of the actual rhetorical and discursive community tends to remain hidden. Community needs living discursive and rhetoric content for it to "be". When taken out of such a context, the concept of community is emptied of its meaning. In fact one could even ask whether community is something that is ever fully realized but is instead something we are constantly striving to attain. An underused theoretical resource in this study was the primary contradiction between use-value and exchange-value (Engeström, 1987) that became visible in the licensing issues of OpenOffice.org and splitting up of the Groupware communities.

Ian Burkitt (1999, p. 14) has proposed that we are thinking bodies through the idea of three relations of thoughtful human activity. The first types of relations are "relations of communication", describing the positioning of the individual within a social group and the reflection of that position back to the individual through the use of socially constructed symbols, signs and language, giving place and meaning to the person's identity. The second types of relations are "relations of power" referring to the "formation of social structure including inequalities that have arisen between individuals in their positioning in the social structure". The third type of relations are "relations that transform the real" and describes the "positioning of the social groups and social individuals within them to the non-human world", that is, material objects and events (Burkitt, 1999, p. 14, see also, p. 69–79)[71]. When my approach is evaluated against these propositions, it is clear that I was unable to take into account the fact that the community members' bodies made their participation possible. Given that local coding activities are also important in open source development (Takhteyev, 2009a), the lack of face-to-face observational data may well count as the biggest limitation of this study. Should Internet research include the study of "relations that transform the real" or should we just accept that Internet communities, like the one studied here, have emerged into being without the majority of its members being aware of each other's bodies? In this sense, we could argue that the mediated nature of community life on the net is as real as communities based on face-to-face interaction (see also Castells, 1996; Rheingold, 2000; Delanty, 2010). I argue that that in online communities lacking

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[71] These are based on Norbert Elias' (1991) three principle co-ordinates of human life: the shaping and positioning of the individual within the social structure, the social structure itself, and the relation of social human beings to events in the non-human world (Burkitt, 1999).

face-to-face communication, the act of imagination is even more central. If we follow this line of thinking, it could be suggested that in order to grasp the "real" meaning of community life on the net, we should pay even more attention to the imagined, expressed in discursive encounters between community members.

EPILOGUE

Who and where is the OpenOffice.org community today? The unpredictability and dynamics of the open development model and community are evident in the events that took place after I had left my research site and my dissertation for pre-review.

Oracle announced on June 1, 2011 that the "hybrid" open source community OpenOffice.org that I had been following for seven years had been turned into a community-driven project. The Oracle Corporation contributed the whole of the OpenOffice.org code and project to the Apache Software Foundation, which provides organizational, legal, and financial support for a broad range of open source software projects. The development process of the Apache Foundation is characterized as "meritocratic" and "collaborative".[72] "Apache OpenOffice.org" is now an Incubator project with 79 volunteer developers contributing[73] to it, while the pragmatic Apache License makes it possible for individual volunteer contributors and commercial contributors to collaborate on open source development.[74]

Anticipating Oracle's announcement to hand the code over to the Apache Foundation, a truly "community-driven incident" took place earlier on September 28, 2010. A group of OpenOffice.org volunteers formed a new group "The Document Foundation" by forking the OpenOffice.org code and naming it "LibreOffice". The fears that Oracle might discontinue OpenOffice.org or place restrictions on it as an open source project were offered as the main reasons for taking this action.[75] The statement on the project's website underlines that openness, transparency, and valuing people for their contribution–the community's core values–are best achieved through an independent self-governing democratic foundation.[76] To date, the Document Foundation has 300 volunteer developers contributing to it.[77] The LGPL license, which made the forking of the code possible in the first place, is used in the project.

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[72] http://www.marketwire.com/press-release/statements-on-openofficeorg-contribution-to-apache-nasdaq-orcl-1521400.htm.

[73] http://incubator.apache.org/projects/openofficeorg.html.

[74] http://www.apache.org/foundation/.

[75] http://en.wikipedia.org/wiki/LibreOffice.

[76] httpp://listarchives.documentfoundation.org/www/announce/msg00000.html.

[77] http://blog.documentfoundation.org/category/announcements/.

Thus, what I knew as the hybrid OpenOffice.org project has now split into two (competing) community-driven projects, of which the Document Foundation and its product LibreOffice seem to have attracted the most volunteers. Both projects have volunteer developers who are familiar to me, some of whom I have even interviewed. The difference between the community-driven projects seems ideologically rooted. Only time will tell which of the projects will succeed and whether there are enough volunteers interested in developing these products. I cannot help but ask the intriguing, yet provocative question: Did the volunteers win the battle against the firm or was this line of development Sun Microsystems' intention all a long? Did the firm compromise the espoused core values of the "community"–openness, transparency and recognition–as the case of the OpenOffice.org Groupware project showed or did the OpenOffice.org Community Manager in his strategic writings of the "community" anticipate the new community-driven organizational model? If I were to continue my work on this topic, I would eagerly follow both community projects. What the transition of the OpenOffice.org project from a hybrid to community-driven project has shown is that Open Source Software Development has a truly runaway character.

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APPENDICES

Appendix 1

The Joint Copyright Assigment (JCA)

OpenOffice.org Open Source Project Joint Copyright Assignment by Contributor To Sun Microsystems, Inc. ("Sun")

Full Name:_____ (the "Contributor")
E-mail:_____ Mailing Address:_____
_____ Telephone:_____
Facsimile:_____ Country:_____

1. Contributor owns, and has sufficient rights to contribute, all source code and related material intended to be compiled or integrated with the source code for the OpenOffice.org open source product (the "Contribution") which Contributor has ever delivered, and Sun has accepted, for incorporation into the technology made available under the OpenOffice.org open source project.
2. Contributor hereby assigns to Sun joint ownership in all worldwide common law and statutory rights associated with the copyrights, copyright application, copyright registration and moral rights in the Contribution to the extent allowable under applicable local laws and copyright conventions. Contributor agrees that this assignment may be submitted by Sun to register a copyright in the Contribution. Contributor retains the right to use the Contribution for Contributor's own purposes. This Joint Copyright Assignment supersedes and replaces all prior copyright assignments made by Contributor to Sun under the OpenOffice.org project.
3. Contributor is legally entitled to grant the above assignment and agrees not to provide any Contribution that violates any law or breaches any contract.
Signed:_____ Date_____ Printed Name:_____ Please fax a signed original of this assignment to Fax: +1-408-549-9923
- or - Mail a signed original to: Eric Renaud OpenOffice.org/Sun Microsystems 4120 Network Circle, USCA12-105 Santa Clara, CA 95054 USA - or - Scan a signed original and email to Copyrightfax@sun.com

Appendix 2

Interview Themes and Spesific Questions/ Stephanie Freeman/14.01.2005

Theme 1. Professional expectancies and other related interests

1. What is your education and working history?
2. What do you hope to get out of OpenOffice.org and Lingucomponent/Bibliografic/Groupware, professionally?
3. What do you hope to do in the future?
4. How would you describe your computing skills?
5. Where and how did you acquire your computing skills?
6. How did you get involved with OpenOffice.org?
7. What does 'OpenOffice.org' mean to you?
8. How did you get involved with your project?
9. What does your project mean to you?
10. Do you have any other parallel spare time activities apart from your project?
11. Could you describe how you got involved with these other activities?
12. What about people – with whom do you collaborate in these activities?
13. How do you divide your time between these different activities?

Theme 2. Recruiting and guiding newcomers

1. How would you describe the OpenOffice.org "recruiting strategy"?
2. From your point of view, who would be the potential OpenOffice.org contributors?
3. Why do you think someone would want to join OpenOffice.org?
4. From your point of view, what would be the best way to attract newcomers?
5. What different places do you look/have looked for newcomers?
6. In your experience, what kind of problems emerge when trying to recruit newcomers?
7. What kind of technology is used in recruiting newcomers?
8. How would you describe the process of entering a new project?
9. In what ways have you helped newcomers?
10. Why do you want to help newcomers?
11. Are there any means for guiding newcomers and are they sufficient?
12. How can you tell that someone is a 'newbie'?
13. What are the most typical problems newcomers face when they enter the project?

14. In what ways do you think newcomers need to be helped out?
15. If I was interested in joining your project, what kind of instructions would you give me?
16. What kind of tools have been developed to aid newcomers?
17. Do you know any people who have left your project. Is so, why have they left?

Theme 3. The role of the Community Council in the development process of the Lingucomponent project

1. How does the Community Council work from your point of view?
2. How does the Community Council participate in the decisions of your project?
3. When Sun closed the code for Glow, people where not happy: they were not informed by the Community Council -so you no about this? What do you think?

Theme 4. How and by what means the Bibliographic project works

1. How is the contribution of an individual dealt with in your project?
2. What are the most important tools used in the project?
3. What is your contribution?
4. What is a valuable contribution?
5. In what ways have you participated?
6. What are the next steps and how would you like to participate?

Theme 5. The meaning of 'Free Software and 'Open Source Software development' in OpenOffice.org

1. What the 'open development model' means in your project?
2. How does the OpenOffice.org 'child work spaces' differ from what is called a 'branch'?

Theme 6. The selection and use of programming languages in OpenOffice.org

1. Do you see any problem because people are excluded due to the programming languages – is it a big loss?
2. Your point of view on using "closed programming languages" in developing open source software?

Theme 7. The dual-licensing strategy in OpenOffice.org

1. Could you tell me about the OpenOffice.org Dual-licensing scheme GPL +LGPL and SISSL ?
2. Have you signed the Joint Copyright Assignment?
3. If not, why?
4. The community manger Louis suggested moving to GPL and some other commercial license at the OpenOffice.org 2004 conference – what do you think of his suggestion?
5. Do you see any problems related to combining a commercial and GPL license?

Theme 8. The significance of the OpenOffice.org annual conference

1. Have you participated in the annual OpenOffice.org conference?
2. If you have, why?
3. What do you learn or hope top learn?
4. What sessions did you attend?
5. Who did you meet there?
6. If not, why?

Theme 9. The roles of developers and users in OpenOffice.org

1. In the OpenOffice.org 2004 conference "Townhall meeting' there was a discussion of different groups of people. Denise Cooper tried to count how many 'developers', 'users', 'end-users' etc..were at the meeting, which turned out to be difficult as people didn't really know which group they belonged to. How many different groups do you see in OpenOffice.org?
2. Are there any conflicts between different groups of people?
3. On the OpenOffice.org front page is the following mission: "To create, as a community, the leading international office suite that will run on all major platforms and provide access to all functionality and data through open-component based APIs and an XML-based file format." How would you comment on this?
4. Is it possible to have a 77 subproject 'community'?
5. What does it mean to be a 'community'?
6. To what community/communities do you feel you belong?
7. When does one become a member of the 'community'?

Appendix 3

List of historical documents used in constructing the narratives regarding Finnish public sector organizations and their decision-making processes

1.Tietoja valtion tietohallinnosta ja tietotekniikasta 2000. Information Technology within the government 2000. Valtiovarainministeriö.

2. Valtion tietotekniikan rajapintasuosituksia.Valtiovarainministeriön työryhmämuistioita 27/2001. Valtiovarainministeriö. Hallinnon kehittämisosasto.

3. Suositus valiton tietojärjestelmien koodin ja rajapintojen avoimuudesta. Työryhmämuistioita. 23/2003.Valtiovarainministeriö . Hallinnon kehittämisosasto.

4. Valtioneuvoston kanslian tietohallintostrategia 2004-2008. Valtioneuvoston kanslian raportteja. 8/2004. Valtionneuvoston kanslian raportteja 8/2004.

5. Valtionhallinnon johtoryhmän pöytäkirja 8.3.2002. Valtiovarainministeriö.

6. Tietoja valtion tietohallinnosta ja tietotekniikasta 2006. Tutkimukset ja selvitykset 5a/2007. Valtiovarainministeriö . Hallinnon kehittämisosasto.

7. Karjalainen, M. (2005a). Oikeusministeriön hallinnonalan toimisto-ohjelmaselvitys: Lotus SmartSuite, Microsoft Office, OpenOffice.org (Office Software Evaluation for the Administrative Sector of the Ministry of Justice: Lotus SmartSuite, Microsoft Office, OpenOffice.org). Ministry of Justice, Operations and administration 2005:4, ISBN 952-466- 238-8, 35 pages (in Finnish), 11 March 2005, URL: http://www.om.fi/Etusivu/Julkaisut/Julkaisusarjat/Toimintajahallinto/Toiminnanjahallinnonarkisto/Toimintajahallinto2005/1145624743414 .

8. Karjalainen, M. (2006a). OpenOffice.org versio 2. Kysymysten ja vastausten käsikirja (OpenOffice.org Version 2. Handbook of Questions and Answers). Ministry of Justice, Operations and administration 2006:19, ISBN 952-466-383-X, 73 pages (in Finnish), 18 May 2006, URL: http://www.om.fi/Etusivu/Julkaisut/Toimintajahallinto/Toiminnanjahallinnonarkisto/Toimintajahallinto-2006/1149508969631.

9. Karjalainen, M. (2006b). Oikeusministeriön OpenOffice.org-pilotoinnin loppuraportti (Final Report of the OpenOffice.org Pilot of the Ministry of Justice). Ministry of Justice, Operations and administration 2006:29, ISBN 952-466-393-7, 78 pages (in Finnish), 12 October 2006, URL: http://www.om.fi/Etusivu/Julkaisut/Julkaisusarjat/Toimintajahallinto/Toiminnanjahallin nonarkisto/Toimintajahallinto2006/1160733641585.

10. Loppuraportti OpenOffice-työaseman ja Linux-käyttöjärjestelmän soveltu-vuudesta kaupungin työasemavaihtoehdoksi.Turun kaupungin tietotekniikka-osasto, projektipäällikkö Eija Onnela. 17.12.2001.

11. Varteenotettava vaihtoehto – avoimen lähdekoodin käyttö julkishallinnossa. Turun kaupungin kanslia. Tietotekniikkapalvelut. Eija Onnela. 14.8.2003 v 1.2

Minutes of meetings, the Department of Justice:

Tietohallinon yhteistyöryhmän kokous 22.2.2005.

Tietohallinon yhteistyöryhmän kokous 25.1.2006.

Tietohallinon yhteistyöryhmän kokous 25.10.2006.

Tietohallinon yhteistyöryhmän kokous 7.3.2006.

Tietohallinon yhteistyöryhmän kokous 28.3.2006.

Tietohallinon yhteistyöryhmän kokous 29.5.2006.

Tietohallinon yhteistyöryhmän kokous 4.9.2006.

Tietohallinon yhteistyöryhmän kokous 26.9.2006.

Tietohallinon yhteistyöryhmän kokous 24.10.2006.

Appendix 4

List of used abbreviations

CHAT = Cultural Historical Activity Theory

CoP = Communities of Practice

GPL = General Public License

LGPL = Lesser General Public License

FAQ = Frequently Asked Questions

FLOSS = Free /Libre Open Source Software

FMI = The Finnish Meteorological Institute

ICT = Information and Communications Technology

IM = Instant Message

JCA = Joint Copyright Agreement

MF = Ministry Of Finance

MJ = Ministry of Justice

ODM = Open Development Model

OS = Open Source

OSI = Open Source Initiative

PC = Personal Computer

SISSL = Sun Industry Source License

TC = Thin Client