

The Sociability of Free Software

A GNU Look at Free Software Identified Businesses as Social Entrepreneurships

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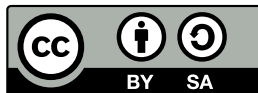
Abstract

This research strives to address the gap in the literature surrounding companies which identify with the philosophical values associated with the Free Software movement, which have historically been associated with Open Source businesses. It investigates whether ethically-motivated Free Software identified companies resemble social entrepreneurships. This work also examines whether there are significant differences between the business practices of Free Software identified companies, Free Software, and Open Source enterprises in order to assess if it is appropriate to address them as a group.

The study is based on seven case studies, and includes one company which is a Free Software business, but does not identify with the Free Software philosophy, as well as one company which is ethically-motivated but identifies with Open Source rather than Free Software.

The results indicate that there is good reason to believe that adherence to Free Software philosophy creates socially-aware businesses, which may be social entrepreneurships. No problems were discovered with the practice of grouping together Free Software and Open Source companies in the study of business practices, provided that a broad definition of success is used.

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List of Abbreviations

FLOSS Free/Libre and Open Source Software

FS Free Software

FSF Free Software Foundation

FSi Free Software identified (company)

OS, OSS Open Source (Software)

OSI Open Source Initiative

1

Introduction

Software developers are drawn to Free and Open Source Software for a variety of reasons, including idealistic beliefs, according to Hars and Ou, Elliot, and Gacek and Arief, and others (as cited in Schofield & Cooper, 2008). The ideological motive has been less studied than altruistic or economic motives, and the businesses these individuals found have attracted even less attention.

What if these businesses are distinct from the Open Source businesses which have been widely studied, but having something in common with another category of business: the social entrepreneurship? This is the question raised by this paper.

1.1 Problem Statement and Research Question

At the turn of the century, it was difficult for people to accept that there could be sustainable Free/Libre and Open Source Software (FLOSS) businesses (Feller & Fitzgerald, 2002). That it is possible is now evident, given the success of high-profile companies such as Red Hat, which prospered both before and after the collapse of the IT bubble in 1999. In addition, there have been several notable

acquisitions of FLOSS companies by well-known software and hardware firms such as IBM and Novell. It is now generally accepted that it is possible to have a viable business which relies on FLOSS. Krishnamurthy (2005, p. 295–296) concluded: “We are increasingly finding that open source software communities are awesome competitors. They are able to compete with large companies on equal footing and even defeat them.” Research has moved from asking whether it is possible to make money with FLOSS to what successful strategies can be implemented on top of FLOSS (Daffara, 2009b).

The vast majority of this body of work has looked at Free *and* Open Source software companies or only Open Source companies—not Free Software companies. The extent of the difference between Free Software companies and FLOSS companies varies depending on the definition of the FLOSS company, but even with the most restricted definition, Free Software businesses have fewer business models available to them. The main distinction, however, may be the ethical perspective of the founder(s). In general, people who identify with Free Software see freedom as a non-negotiable component of their activities, whereas Open Source practitioners downplay the concept of freedom (Ghosh, Glott, Krieger, & Robles, 2002).

Such a strong ethical orientation in a founder may make a difference in a company, especially when it comes to defining what constitutes success. One term which is frequently used to describe companies which consider mission pre-eminent is social entrepreneurships. This study will first consider whether there is any merit to the idea of understanding Free Software identified (FSi) businesses as social entrepreneurships, and whether this has the potential to inform understanding of what constitutes a successful business. This link would greatly contribute towards addressing the gap in literature surrounding Free Software

businesses. This paper will also examine whether there appears to be a difference between the practices of successful Free Software companies and the FLOSS companies described in earlier literature.

In summary, this research will address the following questions:

Can the success of FSi companies be understood through the lens of social entrepreneurship?

Do the practices of a successful FSi company differ from the practices of successful FLOSS businesses identified in earlier literature?

1.2 Purpose and Relevance of Study

Ghosh et al. (2002) showed that the FLOSS community contains people who identify exclusively with the Free Software movement, and do not see themselves as part of the Open Source movement. It has also been established that developers have a range of motives for participating, and some are driven by Free Software ideology (Ghosh et al.). Relatively little is known about the extent to which people in either of these two groups (which may significantly overlap) are similar to or different from the community as a whole. In the area of FLOSS businesses especially, people adhering to a Free Software ideology are ill-represented, perhaps because these views are, for the most part, not involved in the creation of the larger companies¹; because they are a minority within the community (and perhaps an even smaller minority in business); or because they are sometimes seen as hostile to business². Whatever the reason, Free Software business has not

¹Small businesses are less likely to be the focus of empirical research, although they form a large part of the economy (Walker & Brown, 2004).

²This oversimplifies the issue. According to Stallman (1999, p. 61), “The Free Software philosophy rejects a specific widespread business practice, but it is not against business. When

attracted the attention of researchers.

Because so little attention has focused on issues which are particularly relevant to Free Software companies, practitioners are eager for research as opposed to anecdote³. Hang et al. (2005) noted that explanation models are needed, especially by small companies. This paper therefore contributes to the understanding of Free Software businesses faced with the challenges of maintaining both vision and financial success.

FLOSS research is enriched if a link is proposed to another area of research which has hitherto been overlooked. Although social entrepreneurship is also a young field, researchers have tackled many of the same questions which are considered in FLOSS. Thus, social entrepreneurship literature may provide a rich source of existing theories on the challenges faced by Free Software businesses.

Free software has rarely been studied separately from Open Source software. By examining the business side of just one of these movements, and contrasting it to what is known about FLOSS companies, this research takes a preliminary step towards determining if Free Software has been rightfully lumped with Open Source as a single phenomenon. It is possible that this grouping is a cause of the lack of consensus in the field.

1.3 Outline

The thesis began with an introductory chapter. The second chapter details how key terms—such as FLOSS, FSi, and social entrepreneurship—should be understood in the context of this research.

The work continues with an in-depth review of several aspects of FLOSS and businesses respect the users' freedom, we wish them success.”

³One of the respondents cited this as a motivation for participating in this research.

social entrepreneurship which are related to the research questions. Because no extant literature directly relates to the topic, the review attempts to draw a circle around the focal point, touching on all the subjects which have some relevance.

The following chapter, chapter 4, introduces the research method and sample design. It also describes how the data was collected and potential limitations of the research design.

In the subsequent chapter (chapter 5), each case is described independently, and the key facts of the case are explained. Next, the results of a cross-case analysis are reported. The details of the cases were examined collectively in order to expose patterns and differences. The details were addressed in light of the research questions and prior literature.

Finally, in chapter 6, the findings were discussed. The limitations of the work are highlighted, and further avenues of research are proposed.

2

Definitions

Because there is confusion and a lack of consensus about what constitutes a FLOSS business and what are the hallmarks of a social entrepreneurship, it is necessary to eliminate ambiguity before proceeding to the literature review. First, the terms Free Software and Open Source are defined, and relationship between the two concepts is briefly described. Next, the meanings of FLOSS business, Open Source business, Free Software business and Free Software identified business are expounded. The chapter concludes with an explanation of what characteristics of social entrepreneurship are relevant to this research.

2.1 Definition of Free and Open Source Software

The terms *Open Source software* (OS or OSS) and *Free Software* (FS, also known as *libre software*¹) are well defined (see appendices A and B), the former by the Open Source Initiative (OSI), and the latter by the Free Software Foundation

¹Libre is used to eliminate the ambiguity that exists in English over the term free. It should be understood in the context of freedom, rather than free of charge.

(FSF). Within Free Software there are different types of licenses, such as copyleft licenses² like the GNU General Public License (GPL), and the permissive licenses such as the BSD and MIT licenses. There are some differences between the philosophies which inspired the licenses. Copyleft licenses require derivative works to be released under the same license, whereas permissive licenses make no such restrictions. Developers who prefer permissive licenses see them as offering greater freedom, because they allow users to do anything with the software, provided it is attributed (Montague, 2008). Copyleft proponents believe that creating proprietary software is an exercise of power rather than a necessary freedom; proprietary software should therefore be resisted (Kuhn & Stallman, 2010).

Free and Open Source software can be seen as two movements within a single community (Stallman, Ghosh, & Glott, 2002; Stallman, 2002; Perens, 1999) and there is consequently a significant amount of overlap, with many software licenses fitting the definition of both Open Source and Free Software. In earlier literature it is common to find the term Open Source (and its abbreviations) used with the intent of describing both Free and Open Source software. Some practitioners still use the term Open Source in place of Free Software or FLOSS because their clients are more likely to have heard of the term. The use of Open Source in place of FLOSS is accurate in terms of licensing (see figure 2.1 on page 8), but neglects to acknowledge the ideological differences between the two concepts³. As researchers may be using the term to describe the software model (i.e. the license), the development model, or the business model (Daffara, 2009b), more recent works have tended to adopt inclusive acronyms in order to include both movements when referring to the entire community. *Free/Libre and Open Source software* (FLOSS), *Free/Open Source*(F/OS), and *Free and Open Source software*

²Also known as ‘share and share alike’ or ‘*quid pro quo*’ licenses.

³More on these differences can be found in section 3.1.3 on page 20.

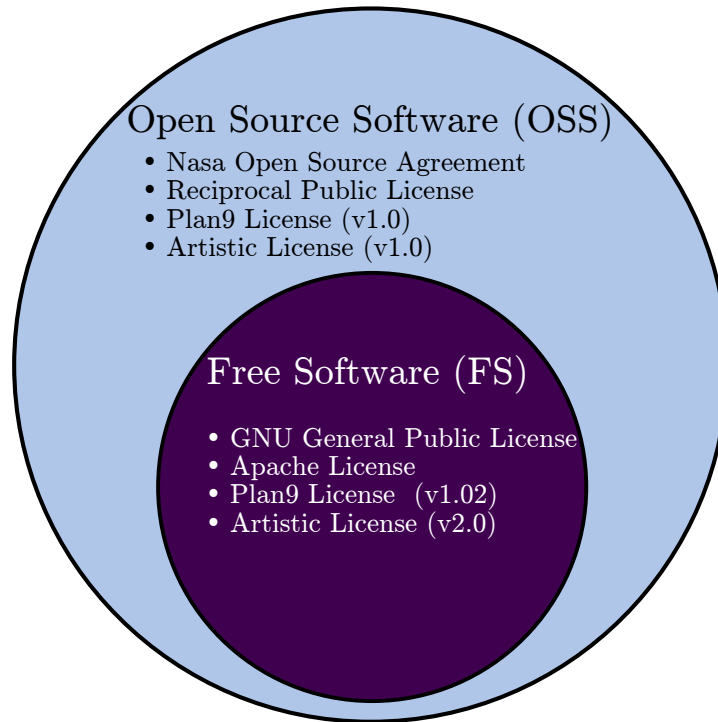


Figure 2.1: Euler Diagram of Free Software and Open Source Licenses (Selected)

(FOSS) are the most common of these terms⁴. OS/FS is sometimes used to mean ‘Open Source or Free Software,’ and should be seen as two terms rather than a compound term⁵.

The convention for this paper is to use FLOSS⁶, except when the intention is to refer to *only* Open Source software, or when quoting an author with a preference for one of the alternative terms (FOSS or F/OS)⁷.

⁴All three terms may be used interchangeably.

⁵This can be seen in Ghosh et al. (2002), which uses FLOSS in other circumstances.

⁶This term was introduced by Ghosh et al. (2002) and is more commonly used in Europe.

⁷Direct quotations involving the literature which refer to FLOSS using the archaic OS or OSS have been modified to ‘[FL]OS[S]’ or ‘[FL]OSS,’ except where the original author’s intent was clearly to refer to only Open Source or Free Software and to change the term would be to change the meaning.

2.2 Definition of Free Software Identified

Business

This research is concerned primarily with Free Software and Free Software identified businesses. However, the closest literature relates to Open Source and FLOSS businesses, so it is necessary to define all four concepts, and their relationship to one another.

What distinguishes a Free/Libre or Open Source company from other businesses? Although Free Software and Open Source are clearly delimited, the meaning of FLOSS company is much more vague. There are no authoritative definitions provided by the community. Researchers rarely state it explicitly, so it is left as an exercise for the reader to infer the author’s working definition. Judging by the wide range of business models proposed (which are listed in Appendix F), the term can be very inclusive or extremely limited.

An example of the variation in interpretations can be seen in three sample definitions. C. Rossi and Bonaccorsi (2006) proposed: “We label as *Open Source* the companies that supply, in various ways, Open Source-based products and services to their customers. It is worth noticing that this definition holds even if firms’ offering includes also proprietary solutions” (p. 90). By contrast, Rosén (2008) studied software product vendors which “base their products on Open Source Software” (p. i). Another study stated: “As the commercial exploitation of Open Source software itself is restricted, commercial business models use Open Source to promote the sale of complementary services and products” (Kooths, Langenfurth, & Kalwey, 2003, p. 5)⁸.

⁸The first rendering is quite broad, but would restrict accessorizing; the next potentially rules out companies which offer services instead of products; while the final denotation allows loss leaders but prohibits dual-licensing.

The most liberal position argues that there are no pure Open Source businesses, but businesses that use Open Source extensively, those that rely on it for advancements in their own products, and ones which run on Open Source software but don't sell or service Open Source code. This view has been put forth by the analyst Koenig (2004), and practitioners Simon Phipps and Tim O'Reilly (as cited in Vance, 2006; Phipps, 2006; Farber, 2006). Given that Gartner estimates that 100 percent of companies today use FLOSS (as cited in Daffara, 2009b, p. 39), every company would have an equal right to claim to be Open Source. Such an observation is meaningless as a definition, which is perhaps the point of those who feel that Open Source is not a business model in and of itself, but part of perhaps every business model.

Clearly, mere usage of FLOSS is not a distinguishing feature. Contributions to FLOSS projects is also an inadequate criterion. Because many projects use collaborative development models where users drive development, such a definition would also include companies outside the information technology (IT) field (Daffara, 2009b). While some researchers (e.g., Feller & Fitzgerald, 2002; Spiller & Wichmann, 2002) are clearly interested in including companies which sell accessories closely related to FLOSS⁹, a definition based solely on contributions would also include companies which are primarily *users* of the software, and for whom FLOSS activities are incidental. An example would be a fashion company which contributes an Italian translation to the FLOSS ERP system it uses; it is obviously not an Open Source company except under the all-inclusive interpretation.

Particular business models have also been criticized as incompatible with the concept of an Open Source business: dual-licensing and open core (e.g., O'Grady,

⁹O'Reilly, a publisher, is a frequently cited illustration of such a company.

2010b; Wayner, 2010). Application vendors making their offerings available over the web (Web 2.0), such as Google and Twitter, are sometimes included (O’Grady, 2009) and other times excluded (Moody, 2010) in community discussions on Open Source companies. For the purposes of this paper, a definition close to the middle of the spectrum is sufficient. This would include the controversial business models, but exclude usage as the sole criterion, as this makes the definition too broad to be useful. *The Open Source company, as used in this research, derives the majority of its revenues through one or more of the revenue sources described by Daffara (2009a), which are listed in appendix F¹⁰. Since FLOSS incorporates both Free Software and Open Source, and Free Software businesses are a subset of Open Source businesses (see figure 2.2), the term *FLOSS business* should be seen as interchangeable with the term *Open Source business*.*

Free software business is not a widely-used term, and offers a useful point of departure from the confusion surrounding the boundaries of Open Source companies, especially when a narrow definition is desired. According to Daffara (2009b), “The critical differentiator is provision of Free Software downstream to customers. In other words: Free Software companies are companies that have adopted business models in which the revenue streams are not tied to proprietary software model licensing conditions” (p. 39). This eliminates all models which incorporate proprietary software into products and sell the products as a primary source of revenue. Richard M. Stallman, founder of the Free Software movement, has made it clear that companies which base their business on proprietary software which works with Free Software should be viewed by the community as proprietary companies rather than Free Software companies (Stallman, 1999).

¹⁰This statement should be seen as a characterization rather than a robust definition, as a definition would accommodate business models yet to be developed. The use of a characterization is consistent with how Open Source businesses are described in other research.

There are two aspects of this definition which are problematic. First, it is not explicit whether *all* revenue streams must be free from proprietary licensing conditions, or whether only a proportion (possibly the majority) must be. For instance, if a company produces custom software on demand, and encourages clients to agree to the work being produced as Free Software, but is willing to accept the occasional proprietary contract, would that company fall within the scope of the Free Software company as defined by Daffara? Based upon the obvious similarities between the definition and the copyleft philosophy espoused by Stallman, and the author's clear desire to narrow the definition, it may be assumed that the intent was to require all revenue streams to conform to the restriction.

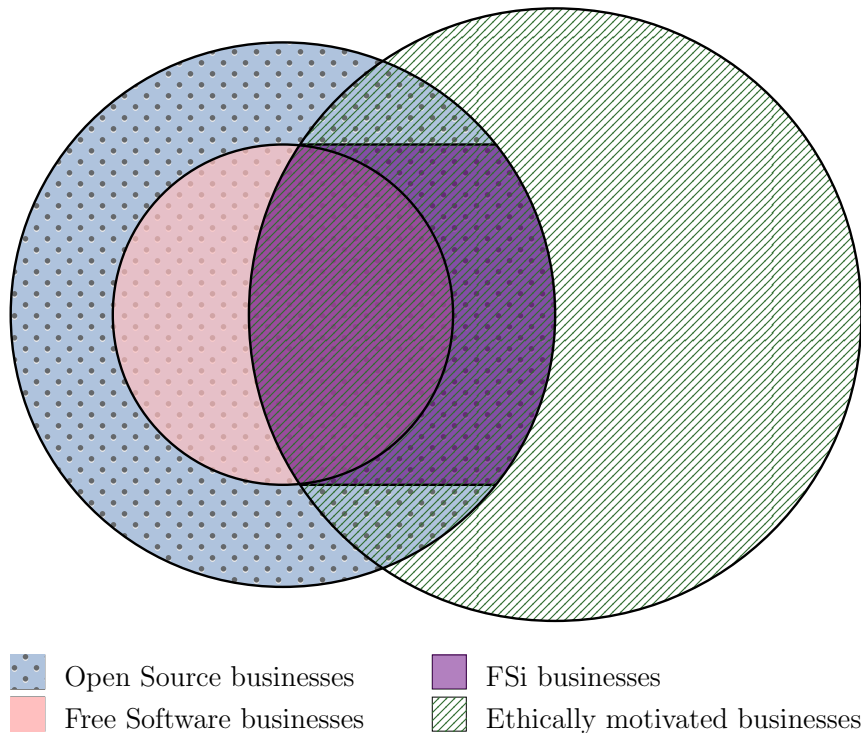
The second problem is that the definition does not indicate whether the business may have other revenue streams which are completely unrelated to software. Without this limitation there is the possibility of misinterpretation, potentially allowing the inclusion of companies which use or contribute to Free Software but which do not produce services or products which rely on Free Software. It is clearly Daffara's intention to exclude companies which derive the bulk of their revenues from other sources. Both usage and contributions were rejected as adequate criteria before the definition was proposed. This additional restriction is also taken as part of the definition in this study.

Because this paper is concerned with companies which are likely to be motivated by the values behind Free Software, the term Free Software company is preferred to Open Source company because it limits the population, excluding businesses which are definitely not the focus of the research. In the absence of a definition derived from within the community, Daffara's definition is adopted with the two caveats mentioned.

However, this definition is weighted toward one philosophical school of thought, namely the copyleft view. It does not incorporate the permissive standpoint. Free Software and the Free Software movement are more closely identified with the FSF and Stallman, who coined the term Free Software. It is therefore not unexpected that Daffara’s definition of a Free Software business has this bias towards Stallmanism¹¹. A business following a permissive Free Software philosophy may have a business model indistinguishable from the Open Source business, but it does not stem from the same philosophy, and a term is needed to differentiate it from Open Source philosophy, which groups it with other businesses following a (different strand of) Free Software philosophy.

The term *Free Software identified* (FSi) company is introduced in this paper to express the difference between a company’s philosophy and its business methods. The definition of Free Software company introduced by Daffara (2009b) excludes business practices which accord with the permissive Free Software philosophy, but which are viewed as unacceptable within the copyleft tradition. The definition also encompasses businesses which use a business model compatible with copyleft Free Software, but do so for pragmatic, economic, or other reasons unrelated to idealism. *A business is described as a Free Software identified company when the company pursues a Free Software philosophy in its business practices, and the philosophy is adopted largely due to idealism.* Figure 2.2 demonstrates the relationship between the different definitions offered in this section.

¹¹This term is actually used, somewhat jokingly, within the community.

Figure 2.2: Euler Diagram of FLOSS Businesses

2.3 Definition of Social Entrepreneurship

The definition of *social entrepreneurship* is anything but straightforward (Sullivan Mort, Weerawardena, & Carnegie, 2003; Martin & Osberg, 2007; Zahra, Gedajlovic, Neubaum, & Shulman, 2008; Neck, Brush, & Allen, 2009). Appendix C shows a selection of definitions. Cook, Dodds & Mitchel, and Wallace define social entrepreneurship as applying business skills in the non-profit sector in order to earn income (as cited in Weerawardena & Sullivan Mort, 2006, p. 22). Another school of thought uses the term to describe activities which are innovative and have a social objective. Dees & Anderson, and Emerson and Twersky suggest that these activities can be carried out by commercial ventures or non-profits (as cited in Austin, Stevenson, & Skillem, 2006, p. 2). A hybrid form involving cross-sector partnerships has also been proposed by Sagawa & Segal, and Waddock (as

cited in Mair & Marí, 2006, p. 37).

Despite this range of definitions, there is general acceptance that social entrepreneurship entails “an innovative use of resources to exploit opportunities that meet a social need in a sustainable manner” (Sud, VanSandt, & BauGous, 2008, p. 203). Innovation and social value are key concepts in the definition of social entrepreneurship for many researchers (e.g., Sullivan Mort et al., 2003; Austin et al., 2006; Weerawardena & Sullivan Mort, 2006; Leadbeater, 2007; Zahra et al., 2008), while others focus on social objectives and re-investing surplus (e.g., Harding, 2006; Bartlett, 2003) For some, mere social value is insufficient: catalytic changes must result from the social entrepreneur’s activity (Waddock & Post, 1991; Roberts & Woods, 2005; Martin & Osberg, 2007). It is even possible to see a conciliatory approach, which allows for *either* social value or catalytic changes (Mair & Marí, 2006).

In the catalytic change approach, a business can only be identified as a social entrepreneurship *ex post* (Martin & Osberg, 2007), which presents difficulties for the researcher trying to focus on young companies. This definition of social entrepreneurship is also the most limiting; all but a small fraction of socially-minded enterprises meet the criteria. Concepts which are present in other definitions of social entrepreneurship, such as the primacy of social change over profit maximization, are acknowledged under other names, such as *social service provision* in the work of Martin and Osberg.

It is the relationship between social good and profit maximization (and its role in FSi businesses) which is under investigation in this paper. The question of whether this concept is best termed a social entrepreneurship, social venture, or something else is beyond the scope of this research. Definitions which express the centrality of the social mission weakly (e.g., the Social Enterprise Coalition’s

“business trading for a social purpose” (as cited in Alter, n.d., Definitions section, para. 5)) risk including companies which engage in morally dubious business practices but also engage in socially responsible activities such as philanthropy. Other definitions introduce additional requirements, such as a risk tolerance (Sullivan Mort et al., 2003) or transformative change (Roberts & Woods, 2005), which are neither necessary to determine whether FSi businesses can be understood in the context of literature about organizations which are motivated by a desire to promote social good, nor accepted by all researchers in the field. A composite definition, which falls within the psychological characteristics school of thought, as described by Cunningham and Lischeron (as cited in Sullivan Mort et al.), is adopted in order to limit the discussion: *“Social entrepreneurship is any attempt at new social enterprise activity or new enterprise creation, such as self-employment, a new enterprise, or the expansion of an existing social enterprise by an individual, teams of individuals or established social enterprise”* (Harding, 2006), *which is “distinguishable by the primacy and centrality of the social mission”* (Sullivan Mort et al.).

3

Literature Review

This review of FLOSS literature provides background on the developers who participate in FLOSS and their motivations for doing so. The possible connection between developers' motivations and the ideological differences between Free and Open Source is examined, and the parallels to social entrepreneurship are introduced. The next section describes company motivations and explains to what extent they resemble the individual motivations previously described. Further information about businesses which is relevant to the second question is presented, namely possible business models and business practices which are viewed as successful. Finally, the review returns to the first question by exploring how success should be defined.

In the second section, social entrepreneurs are considered. The vagueness of the term 'social entrepreneurship' is expounded upon, in order to demonstrate the potential problems with placing Free Software in a social entrepreneurship context. Alternate terms in use in the literature are also suggested. The earlier topic of what constitutes success is revisited, in order to allow comparisons between Free Software and social entrepreneurship conceptions of success. The

measures that increase the likelihood of success are also of interest, as they may be compared to the suggestions given to FLOSS businesses. The section concludes with an examination of what is currently known about the intersection between IT and social value.

3.1 Free/Libre and Open Source Software

FLOSS is a relatively new research topic, but in the early decades of computer science exchange of software source code was the norm, although the term ‘Free Software’ was not used before the GNU Manifesto appeared in 1985¹. It was not until the popular computer-oriented press started writing about Linux and Apache in the 1990s that the topic came to the notice of researchers outside computer science departments. Academic literature on FLOSS first began to appear circa 2000. Detailed histories of Free and Open Source software have been recited so frequently (e.g., Nadan (2002); Lerner and Tirole (2002); Wichmann (2002); Kooths et al. (2003); Van Wendel de Joode et al. (2006); Rosén (2008); Daffara (2009b)) that it is no longer necessary or useful to repeat the basic facts. Appendix D provides a limited timeline for reference.

3.1.1 Demographics of Developers

Early research focused on the character of the FLOSS developer: what sort of person is he², and what are his motivations? Through this early research the FLOSS developer emerged as much more likely to be a professional than a student (depending on the source, 65% to 80% Feller and Fitzgerald (2002) and Ghosh

¹‘Open Source’ was not coined until circa 1998.

²FLOSS developers are overwhelmingly male: 98.9% in a study conducted by Ghosh et al. (2002), as opposed to 75% of all software developers (in 2009) (Ashcraft & Blithe, 2010).

et al. (2002), respectively), with a relatively high proportion (14%) being self-employed (Ghosh et al.). Literature in the second half of the decade looked at the growing phenomenon of developers creating FLOSS as a component of their paid employment (Matusow, 2005; O’Mahony, 2005; Bessen, 2006)³.

3.1.2 Motivations of Developers

Initial investigations into the motivations of FLOSS developers were anchored by the anthropologically-influenced works of Eric S. Raymond, whose seminal *The Cathedral and the Bazaar* (1999b) used a participant-observation approach to provide one of the first mainstream conceptions of FLOSS subculture. Raymond placed FLOSS in the context of a ‘gift culture⁴,’ where status can be gained through competitive generosity. The relevance of this approach has been confirmed by researchers, but it offers an incomplete explanation (Choi, Kim, & Yu, 2009). Other motivations put forth through the narrative mythology of the community—such as the hacker ethos⁵ (“scratching an itch”), the scholarly view⁶, and political conviction (limiting the power of proprietary companies)—have also been observed (O’Mahony, 2005; Ghosh et al., 2002; Luthiger & Jungwirth, 2008; Lerner & Tirole, 2002). In addition, more self-interested motivations such as improving job opportunities are present (Ghosh et al., 2002; Lerner & Tirole, 2002). Appendix E provides a detailed list of motivations found in literature, while figure 3.1 on page 21 contains the results of one study and indicates the prevalence

³For a more complete summary of the state of FLOSS literature, refer to M. A. Rossi (2006).

⁴In the essay *Homesteading the Noosphere*, which appeared in *The Cathedral and the Bazaar* (Raymond, 1999b), not to be confused with the essay *The Cathedral and the Bazaar* (Raymond, 1997) (which was also published in *The Cathedral and the Bazaar* (Raymond, 1999b)).

⁵The hacker ethic includes the pursuit of work which is intrinsically interesting, and freedom (Feller & Fitzgerald, 2002).

⁶In which FLOSS is seen as part of the academic tradition of open science, which stretches back to the mid-sixteenth century (Vujovic & Ulhøi, 2006).

of each motivation.

The range of motivations has contributed towards the division of FLOSS research into two main schools of thought (Choi et al., 2009). The first group takes the anthropological approach, and looks at motivations linked to reciprocity, kinship, and gift economies. The second view, which is demonstrated by researchers such as Iannacci, and Lerner and Tirole, is influenced by traditional neoclassical economics and understands the extrinsic motivations such as private reputation development within this framework (as cited in Choi et al., p. 523). The difference in findings could be due not only to both types of motivations existing in the community, as was suggested by Choi et al., but also the result of researchers focusing on different segments of the community (i.e. Open Source alone, or Free/Libre and Open Source software).

3.1.3 Ideology and Social Entrepreneurships

Ghosh et al. (2002) examined both motivation and movements within the FLOSS community. Forty-eight percent of the sample identified with the Free Software movement, and 32.6% with the Open Source movement, with the rest expressing no preference. While more than half of those studied found little difference between the movements, approximately 30% observed fundamental differences (Ghosh et al.). People who identified with Free Software were more likely to see this distinction (Ghosh et al.; May, 2006). They made up 18% of the total sample (Ghosh et al.). Unfortunately this study did not indicate whether there is a relationship between identification with a movement and specific motivations⁷.

⁷It is unclear whether this information was available to the study authors. A sample of the questionnaire posted to developer groups (given at <http://www.flossproject.org/floss1/stats.html>) includes questions about community, but not motivation, suggesting that these questions were asked at different times, to different samples.

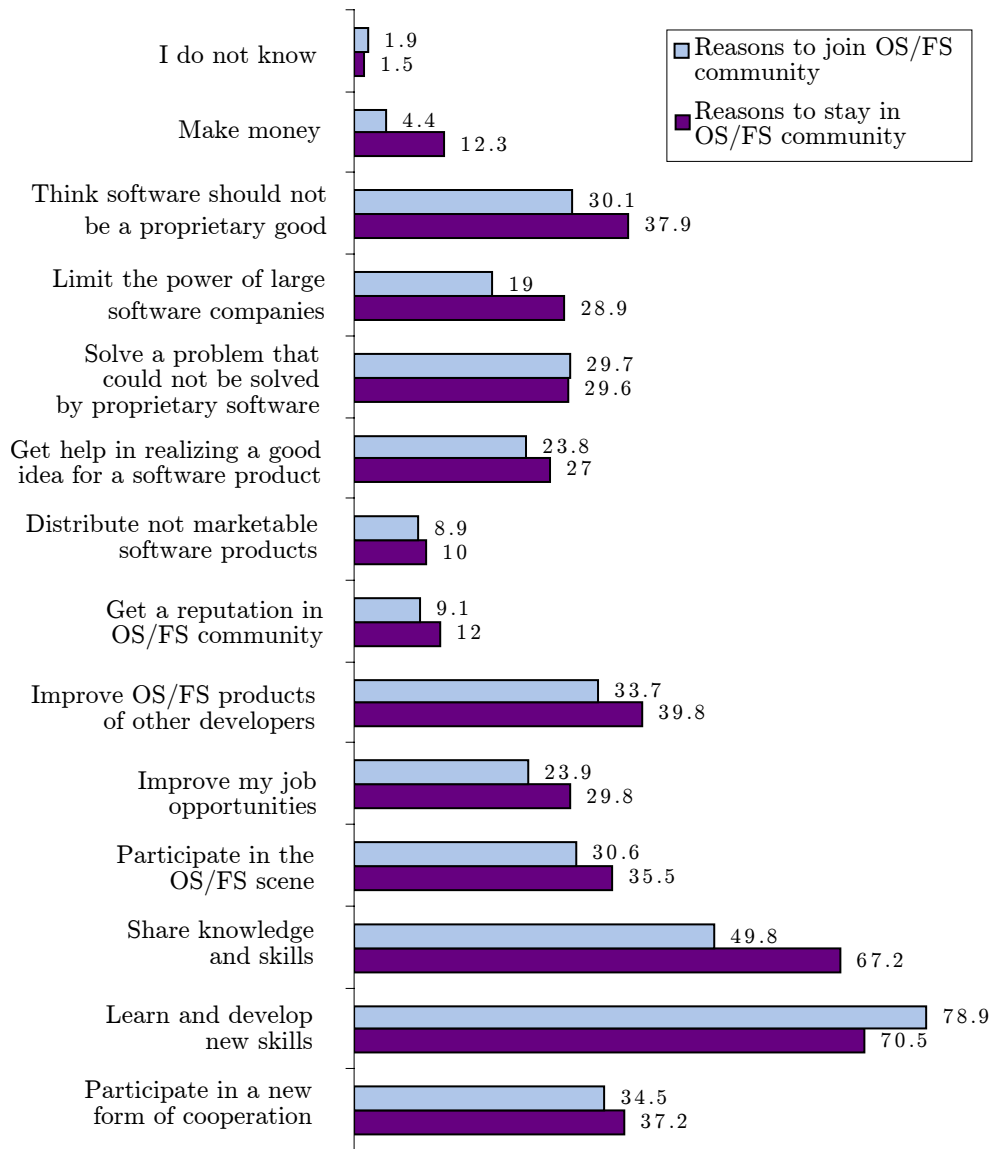


Figure 3.1: Reasons to Join and to Stay in OS/FS Community (Ghosh et al., 2002, p. 45)

Open Source focuses on the practical benefits of access to source code, whereas Free Software is “a politicised critique of software ownership based on its utility; software should not be owned because like language, it is foundational to the society that uses it” (May, 2006, p. 132). Free Software is evangelical about giving the user certain freedoms (which are listed in appendix B), which “contain ethical issues, aspects of responsibilities and of convenience” (Ghosh et al., 2002, p. 51).

The ethical issues involved in Free Software differ depending on the guiding philosophy. One of the main points of difference between copyleft and permissive approaches is the answer to the question “Is it morally justifiable to restrict the freedom of another in order to ensure that the overall freedom of the community not be compromised” (Chopra & Dexter, n.d., “A Dilemma and its resolution,” para. 2). In the permissive school of thought, the answer is ‘no.’ True freedom permits all forms of use, even incorporating the software into proprietary products (Beppu, 2002) without contributing anything in return. Such ‘free riding’ is perceived as neither helping nor hindering (Reese & Stenberg, 2001). The voluntary cooperation model is seen as preferable to contributions imposed by copyleft, because in mandatory reciprocity there is “no notion of proportional fairness; the *quid pro quo* was in reality a *quodque pro quo*⁸. We realized that it was unethical to impose our ideas on the efforts of others” (Reese and Stenberg, “The Transition,” para. 2).

The cornerstone of the copyleft vision of Free Software is “freedom for all users, whether they program often, occasionally, or not at all” (Kuhn & Stallman, 2010, para. 2). Stallman (2002) describes his decision to pursue free software over developing proprietary software as a stark moral choice: “I knew that at the

⁸‘Everything in return for something.’

end of my career, I would look back on years of building walls to divide people, and feel I had spent my life making the world a worse place” (p. 19). Copy-righting, when applied to software, “gives software programs ‘owners,’ most of whom aim to withhold software’s potential benefit from the rest of the public” and use “increasingly nasty and draconian measures to enforce software copy-right” (Stallman, p. 47). Society needs “information that is truly available to its citizens” (Stallman, p. 49) and freedom. Society should also encourage free and open voluntary cooperation between citizens (Stallman). Patent law is a “dangerous obstacle to all software development” (Stallman, p. 97) because it creates an absolute monopoly over an idea, which is often described so broadly that it will rule out an entire field, thus impeding progress in software development, which depends on incremental innovation (Stallman).

Individuals can be bound to the FLOSS community through a psychological contract, and may imbue the community with an anthropomorphic identity, in much the same way that a loyal employee may identify with her firm (Choi et al., 2009). A person’s beliefs affect her motivations (Noggle, 1997). Therefore, it can be posited that a belief or identification with Free Software ideology increases the likelihood that a developer has motivations which relate to the central tenets of Free Software. This need not be to the exclusion of other motivations. Founders of social entrepreneurships, who are widely seen as having altruistic motivations, may also have additional motives, such as personal fulfillment (Mair & Marí, 2006) or financial profit (Seelos & Mair, 2005).

Furthermore, a person who holds these beliefs and identifies with the community is more likely to view the goals of the group as a social good in and of itself (MacIntyre, 1981/2007; Fukuyama, 2001). Cho notes that notions of what constitutes a social good can vary by the individual (as cited in Sud et al., 2008,

p. 208). Thus this belief in the social good of Free Software can be held irrespective of how FLOSS is viewed by society at large, where it is primarily accepted as a means to an end: relegated to the role of tool in the service of poverty reduction (e.g., Blake & Tucker, 2006), or viewed as an aid in avoiding vendor lock-in in the public sector (e.g., Simon, 2005)⁹. Stallman (2002, emphasis added) stated: “For the Free Software movement, non-Free Software is a *social problem* and Free Software is the solution” (p. 57)¹⁰.

Bonaccorsi and Rossi have also found that the motivations of smaller companies are much closer to the motivations of individuals (as cited in M. A. Rossi, 2006, p. 38). Belief also plays a role in the founding of social entrepreneurships, and differentiates them from other types of companies (Sullivan Mort et al., 2003). Social entrepreneurship is further explored in section 3.2 on page 36.

In summary, the FLOSS community is made up of people who belong to different movements. The Free Software movement contains a strong element of ethical belief, and members of this group may see Free Software as a social good in itself, as opposed to viewing it solely as a means of achieving other social goods. Social entrepreneurships are founded with an imperative to promote the social good, although the definition of what constitutes a public good is not universally agreed upon. Therefore, it is possible that when an individual who strongly identifies with the goals of Free Software forms a company in order to further these objectives (for instance by increasing use of and knowledge of Free Software), the business is a social entrepreneurship.

⁹It is interesting to note, however, that information technology is no longer seen exclusively as an enabler or luxury; rather, the digital divide is seen as another issue which must be addressed in conjunction with other development goals (May, 2006).

¹⁰Obviously Stallman represents the copyleft position, but while a permissive Free Software devotee would not see proprietary software as an inherently wrong, she could be just as committed to increasing the role of Free Software in society out of a belief that freedom is beneficial.

3.1.4 Motivations of Companies

FLOSS business research followed in the footsteps of practitioners such as Young (1999), Stallman (1999), and O'Reilly (1999), much as research on developers was built upon the writings of developers. This pattern is typical in information systems research, as the rapid rate of innovation often leaves researchers to study the practices established by practitioners, instead of advising on implementation (Benbasat, Goldstein, & Mead, 1987). Practitioners dealt with how and when a company should open source (Behlendorf, 1999), the business practices of pioneers and the viability of the FLOSS business (Stallman, 1999; Young, 1999; Raymond, 1999a) and how FLOSS was changing the business landscape (Perens, 1999; O'Reilly, 1999, 2005).

Early academic literature consisted of two strands. The first looked at the motivation of companies (Wichmann, 2002; Bessen, 2006; M. A. Rossi, 2006). Just as individuals have a range of motivations, company motivations also vary, although extrinsic motivations are more heavily represented (C. Rossi & Bonaccorsi, 2006). Larger companies may be motivated to participate in FLOSS development out of a desire for standardization, to make use of low-cost components, out of strategic considerations, to enable compatibility (Wichmann, 2002), in a quest to become more competitive and threaten dominant firms in the marketplace, or because of an interest in making their software or hardware compatible with FLOSS (M. A. Rossi, 2006). It is also possible that firms allow employees to participate in FLOSS as a type of fringe benefit (Bessen, 2006). Firms may also support FLOSS as a public good (Bessen).

The wide range of definitions of 'FLOSS business' makes it extremely likely that some of the difference in observations (particularly in terms of the prevalence of particular motivations) stems from the fact that different populations were be-

ing examined. For instance, C. Rossi and Bonaccorsi (2006), who took a very broad definition of FLOSS business, were able to categorize the sample into different groups based upon the extent to which they expressed support for FLOSS, and the degree to which their actions matched their words. Unsurprisingly, there was a difference in the behaviors exhibited by firms which supported FLOSS in word and deed, and companies which did not. Businesses which participate in FLOSS development from a social motivation join in more projects, create more contributions, and are more likely to have their code contributions accepted into the official project (M. A. Rossi, 2006).

3.1.5 Business Models

The other thread of research examined how companies were able to profit (e.g., Spiller and Wichmann (2002); Krishnamurthy (2005); Hang et al. (2005); Dahlander and Magnusson (2006)). The identification of profitable business models has proven to be one of the most enduring topics in research on FLOSS businesses, perhaps because “initially, the idea that [FL]OSS could be economically viable for commercial organizations seemed the most problematic aspect of the whole phenomenon” (Feller & Fitzgerald, 2002, p. 146). Both academics and practitioners sought to identify sources of revenue and business models¹¹. Several factors have contributed to the bewildering hodge-podge of proposed business models (a selection of which can be found in appendix F).

One reason for the plethora of business models is the relative youth of both the study and the practice of FLOSS business. This means that researchers have been unable to reach a consensus on feasible models, and distinguish stable business practices from ones which are successful in the short term but not sustainable. For

¹¹These terms have been used interchangeably in many sources (Rosén, 2008).

example, the future may see consolidation among development consortia (Daffara, 2009b). The rate of change in the industry means that research may quickly become obsolete; the process of discarding temporarily successful models has already begun. Some business models proposed in early research, such as selling copies of software on CD, have essentially vanished. A study conducted in a few years may well discover that some of the models proposed today no longer exist. For instance, Daffara predicted the demise of the open core model¹², although it was the second most common business model at the time of his study. It is possible that optimal business models have yet to develop because of the market is not completely mature. O’Grady (2010a) suggested there is still room for improvement, perhaps with telemetry services: “The question is whether there are revenue models available to open source vendors that better align customer and vendor needs. . . Open source excels at distribution and volume, so logically the ideal revenue model should leverage that strength.”

Daffara (2009b) identifies another difficulty as the confusion with terms such as Open Source and Free Software, which can be used to describe the software model, the development model, or the business model. These concepts can be seen as three axes of a three-dimensional coordinate system, differentiated by control (software model), collaboration (development model), and revenue (business model). The fact that the term FLOSS covers so many different concepts contributes to the lack of agreement as to what constitutes a FLOSS company. Business practices included by some authors are rejected by others for failing to meet the definition of a FLOSS business. Others may be appropriate for Open Source businesses, but excluded by authors (e.g., Stallman, 1999) who are focused

¹²This is based on two observations of the business model: that it involves an attempt to dominate development communities, which eliminates most of the benefits of the FLOSS development model; and that it is an attempt to disrupt the segment and profit from the disruption.

only on Free Software enterprise.

Finally, some of the ‘revenue sources’ which are proposed have not been successfully monetized independent of other practices (e.g., selling software is generally accompanied by support services (Krishnamurthy, 2005)).

Some researchers, such as Spiller and Wichmann (2002), have taken more systematic approaches to identifying business models. Instead of basing their list on observations of what was present in the marketplace, Spiller and Wichmann (2002) first grouped business models into a hierarchy, and then examined it as a ‘software value chain’ which could be compared to similar proprietary businesses. Naturally, this range of techniques for identifying business models, and the other factors mentioned, resulted in not only a broad selection of models, but also a variety of names for them. In appendix F, the work of Daffara (2009a) (which expands upon Daffara (2009b)¹³) was used as a baseline. It was chosen because it is comprehensive¹⁴—including potentially controversial categories—and it is recent, preferring the terms which have entered into common use. Table 3.1 on page 29 shows this list of models, along with definitions of each.

According to the recent work of Daffara (2009b), ‘product specialist’ is by far the most common of these models, with open core and indirect representing the next largest groups. Services has long been recognized as the most commonplace of FLOSS business models (O’Reilly, 2005; C. Rossi & Bonaccorsi, 2006; Spiller & Wichmann, 2002; DiBona, Ockman, & Stone, 1999). In terms of revenue, platform providers tend to be much larger than either specialists or open core companies (Daffara).

¹³See <http://carlodaffara.conecta.it/?p=90> for an explanation behind the development of the original model.

¹⁴Only two concepts from the appendix are not included: selling CDs, which has limited profit potential given modern internet speeds; and what Luthiger and Jungwirth (2008) dub ‘Open Source application provider,’ which describes an activity without explaining how it can be a source of revenue.

Table 3.1: Summary of FLOSS revenue sources

Dual licensing means that the same software is distributed under a FLOSS license and a proprietary license. Users who wish to use the software in a manner which is not permitted under the FLOSS license can purchase a proprietary license. An example customer would be a company which wants to embed GPL software into their own product but not release their own code. Another example is a web services company using software released under the AGPL as a component of their own offering. The downside of dual licensing is that external contributors must transfer ownership of their contributions or agree to the licensing scheme, which reduces the volume of external contributions.

Open Core has also been called “split FLOSS/proprietary,” or “proprietary value-added.” With this model the company creates proprietary code based on a FLOSS component. The Mozilla Public License is commonly used, as it explicitly permits intermixing. One of the problems with this model is finding the balance between making the FLOSS portion sufficiently attractive to users without removing value from the proprietary project. It is also possible that developers will re-implement the proprietary portion of the project and create a full FLOSS version.

continued on the next page

Product specialists are companies that create or maintain a specific software project. The primary source of revenue comes from services such as training and consulting. It makes use of the common assumption that the most knowledgeable experts of a piece of software are those who have developed it. The downside of this model is that there is a limited barrier of entry for potential competitors, as the only necessary investment is the acquisition of expertise with the software.

Platform providers are companies that provide selection, support, integration and services on a set of projects which collectively form a tested and verified platform. For instance, GNU/Linux distributions such as Ubuntu and Red Hat could be classed in this category. The distributions are mostly licensed under Free Software licenses. The main value proposition is guaranteed quality, stability, and reliability. In addition, such companies may be able to offer a ‘solution’ to customers.

Selection/consulting companies are not strictly developers, but provide consulting and selection or evaluation services on a wide range of products. The impact on FLOSS communities is generally limited, as the evaluation results and process are usually treated as a proprietary asset.

Aggregate support providers provide one-stop support on several separate FLOSS products, often by directly employing developers or forwarding support requests to product specialists.

continued on the next page

Legal certification and consulting do not provide any specific code activity, but provide support in checking license compliance. They may also offer coverage and insurance against legal attacks.

Training and documentation companies offer courses, training, and/or additional documentation and manuals. Sometimes this is offered as part of a support contract.

R&D cost sharing can be used if a company needs a new version of a software package and funds someone to do the work. Later on, the resulting software is redistributed as FLOSS to take advantage of the large number of skilled developers who can improve it. This results in cost savings for the company.

Indirect revenues includes any category where the company funds or engages in the development of FLOSS projects because those projects can create a significant source of revenue for related products. One of the most common cases is the writing of software needed to run hardware.

However, there is no single model which stands above all the others as significantly more successful; companies tend to adopt models depending on the market and the costs involved (Daffara, 2009b). This is unsurprising. The majority of ‘business models’ are based on observations of revenue streams, and do not use a framework to identify other components of the business strategy (Rosén, 2008). By looking at revenue streams in isolation, it is difficult for researchers or practitioners to assess the relevance of particular advice to a specific situation.

Several researchers have proposed methods of either assessing a potential mar-

ket, or of analyzing existing company's overall business plan. Krishnamurthy (2005) proposed looking at product importance and customer applicability in order to identify market potential, while Daffara (2009b) suggested that a company can adjust its position along the three axes described on page 27. Daffara also maintains an overview of the economic advantages and disadvantages associated with each of the models listed in table 3.1. Rosén (2008) advanced an analysis method involving the examination of market position, operational platform, offering (using eight key factors, such as ability to charge and volume), as a means of assessing an existing company. The Osterwalder Business Model Canvas—which involves looking at key partners, key activities, key resources, value proposition, customer relationships, channels, customer segments, revenue streams, and cost structure—also offers a more standardized approach to analyzing the components of success (as cited in Daffara, 2010, para. 16). These models, like any other internal business analysis tool, require detailed knowledge of the company before they can be applied.

3.1.6 Determinants of Success

Success comes not just from selecting the appropriate business model. Prescriptive advice comes from both practitioners and researchers, who have highlighted the necessary (but not sufficient) component of brand management (Young, 1999; Feller & Fitzgerald, 2002; Spiller & Wichmann, 2002; O'Reilly, 2005; Deek & McHugh, 2008). Brand management is one of the key concepts behind the success of Red Hat, one of the more profitable FLOSS companies: “We looked at the commodity industries and began to recognize some ideas. All leading companies selling commodity products . . . base their marketing strategies on building strong brands.” (Young, 1999, p. 116). Other elements which are explicitly mentioned

by practitioners can be summed up as an admonition to understand business¹⁵.

In other words:

Most software ventures fail, regardless of whether they are based on free or proprietary software. The challenge of making money with Free Software is not necessarily greater than with proprietary software—you make money the same way: building a great product, marketing it with skill and imagination, looking after your customers, and thereby building a brand which stands for quality and service. (Young, 1999, p. 471)

For companies starting from a business perspective, the suggestion is to form good relationships with FLOSS communities (Behlendorf, 1999; Dahlander & Magnusson, 2006). Spiller and Wichmann (2002) divide firms active in the FLOSS-related services market based on background. Firms with a FLOSS background can be expected to be more successful when product know-how is important and process knowledge can be easily obtained, for instance in product support and training. Companies expanding into FLOSS-related services tend to have experience in processes and methodology, and will be mainly successful in areas such as strategic consulting and IT consulting.

Because FLOSS is a non-rival good, cooperation between companies is a possible strategy (Pal & Madanmohan, 2002; Daffara, 2009b). Companies could team up to offer the same product or service across a larger geographic area, an option which is most suitable to service providers (Daffara). Another possibility is vertical (among products) arrangement, which involves companies performing an integrated set of activities (Daffara). Finally, multiple vendors with overlapping products can create a horizontal partnership in order to accept larger contracts

¹⁵Product positioning (Young, 1999), market research (Behlendorf, 1999), speed to market, and collaboration (O'Reilly, 2005) are some of the suggestions given.

(Daffara).

3.1.7 Definition of Success

What constitutes success? Based on FLOSS literature, the primary measure of success appears to be financial in character. This is understandable if one takes an economic perspective. “. . . The firms that participate in F/OSS are driven by the profit incentive—F/OSS is just the most social efficient means for many of them to obtain the software they need in their profit-making activities” (Bessen, 2006, p. 80). However, it may not be appropriate to evaluate FLOSS companies with the same standard used for other types of companies (O’Grady, 2010a). A large company has a turnover of billions of dollars. By contrast, the largest pure-play¹⁶ FLOSS companies measure turnover in millions—or even thousands—of dollars. Measures of success such as employee numbers and turnover rely on the implicit assumption that growth is desirable and necessary, which may not be the case for small businesses (Walker & Brown, 2004).

Recently there have been discussions in the FLOSS community about whether there are limits to the financial success pure-play companies can enjoy. In particular, the \$1 billion (USD) turnover mark is seen as a possible barrier (O’Grady, 2009; Moody, 2010). Only Red Hat¹⁷ appears to be close, and the general view is that it is extremely difficult for pure-play FLOSS companies to grow large, because of their role in reducing the size of the market. This aspect of the business was observed early on by practitioners such as Bob Young (as reported by O’Reilly (2005)).

¹⁶A company which does not engage any of the ‘mixed models’ which include proprietary software.

¹⁷Red Hat’s status as a pure-play is questionable, due to bundling with proprietary packages (Feller & Fitzgerald, 2002), but it is a common example in this discussion.

A further difficulty with using a pure financial measure is that FLOSS has both a monetary value and a symbolic value. The intangible assets are inherently difficult to evaluate, as tacit and social elements depend on context and situation (Choi et al., 2009). Findings suggest that non-financial criteria may be more appropriate for gauging success in business, especially in small companies, as the ‘lifestyle’ and ‘personal’ goals such as personal satisfaction and achievement, pride in the job, and a flexible lifestyle are often a large part of the motivation to found a company (Walker & Brown, 2004).

Pure financial measures are not even the norm for evaluating performance in business. For example, the balanced scorecard (Kaplan & Norton, 1996), which considers customer, internal business processes, and learning and growth perspectives (in addition to financial measures) is a widely accepted means of assessment. There have been attempts to identify key performance indicators which can be easily tracked for FLOSS projects, most notably by Crowston et al. (2006). Although this work considered the success of projects rather than companies, some of the indicators may be applicable to FLOSS companies, especially if the company is strongly associated with just one project. The list of possible project performance indicators is reproduced in appendix G.

3.1.8 Conclusion

To conclude, people developing FLOSS are professionals and sometimes business owners. Yet their motivations range from those predicted by traditional neoclassical economics to the more altruistic and ethical views, which are explained by the social and anthropological school of thought. Some FLOSS developers can be characterized as devotees of the Free Software movement, which may influence their motivations and lead them to form social entrepreneurships. Companies

also exhibit a range of motivations, but in smaller businesses the reasons start to resemble those of individual developers. There are several different business models which can be employed by FLOSS companies, although there is also disagreement over what should appear in a comprehensive list. Some business models are more common, but no particular model is a sure route to success. There are a number of other factors businesses should consider, such as branding and relations with the FLOSS community if they want to be successful. Success has traditionally been measured in economic terms, but this may not be the best way to assess the status of FLOSS business, especially when the companies are ethically motivated.

3.2 Social Entrepreneurship

Social entrepreneurship, like FLOSS, is a relatively new field in terms of academic research (Weerawardena & Sullivan Mort, 2006). Research has followed the same path as FLOSS and entrepreneurship literature by being largely phenomenon-driven (Mair & Marí, 2006). According to Mair & Marí, initial investigations looked at the personality of the social entrepreneur, the behavior or processes involved, and the social opportunity, all of which served to emphasize the entrepreneurial aspects and differentiate this manifestation from other endeavors. Drayton determined that social entrepreneurs are characterized by special traits; Thompson, Alvy and Lees discovered that special leadership skills are a component; Bornstein identified a passion in social entrepreneurs to realize their visions; and Drayton found social entrepreneurs to possess strong ethics (as cited in Mair & Marí, 2006, p. 38).

3.2.1 The Struggle for Definition

Although the literature on social entrepreneurship has grown in the last quarter century, it is still fragmented (Sullivan Mort et al., 2003). In particular, there is a great deal of debate over the definition of social entrepreneurship¹⁸. This lack of agreement has led to the term social entrepreneurship being described as “so inclusive that it now has an immense tent into which all manner of socially beneficial activities fit” (Martin & Osberg, 2007, p. 30). To complicate matters, the terms social entrepreneurship and social enterprise (preferred in the US and UK, respectively) are sometimes used interchangeably, and other times treated as two different concepts (Bielefeld, 2009). In this paper, the terms are used as synonyms.

One criticism with the term social entrepreneurship is that the two terms which comprise it are ambiguous (Sud et al., 2008; Zahra et al., 2008). Cunningham and Lischeron identified six different schools of thought about *entrepreneurship* (as cited in Sullivan Mort et al., 2003, p. 78). The ‘great person’ view holds that the entrepreneur has an intuitive ability she or he is born with. The ‘psychological characteristics’ school identifies unique values, attitudes and needs, which are the driving force behind entrepreneurship. The classical school cites innovation as the primary characteristic of entrepreneurial behavior. By contrast, the management school sees entrepreneurs as organizers of economic ventures. The leadership school maintains that entrepreneurs lead people. Finally, the Intrapreneurship school sees entrepreneurial skills as useful in complex organizations.

The term *social* is also nebulous and subjective (Zahra et al., 2008). Seelos and Mair (2005) suggested defining it in terms of ‘widely recognized’ global ob-

¹⁸Section 2.3 on page 14 introduced the range of definitions used in the field.

jectives, namely the goal of achieving sustainable development, but did not offer any rationale for the limitation. Cho warned that unless a social end has been determined through a public political process, it is simply one person's perception of 'the good' (as cited in Sud et al., 2008, p. 208). This prescription for identifying the social good is, however, problematic, given that practitioners may identify themselves in contrast to government (Parkinson & Howorth, 2008), and some ethical perspectives may not be appreciated by society until a later point in time¹⁹. It would suggest that social entrepreneurs can only be identified *ex post*, an opinion which is also held by the 'catalytic change' school of thought. Success is a necessary precondition for social entrepreneurship in this definition, and success can only be determined after the passage of time (Martin & Osberg, 2007).

One approach to mitigate the issues caused by the vagueness of the term *social entrepreneurship* has been to explain it in relation to (non-social) entrepreneurs. A key point of differentiation is the preeminence of social benefit over economic wealth creation (Sullivan Mort et al., 2003; Seelos & Mair, 2005; Mair & Marí, 2006; Martin & Osberg, 2007; Zahra et al., 2008). Another way to put this is that virtues—such as integrity, compassion, empathy and honesty—and moral purpose distinguish the social entrepreneur from the commercial entrepreneur (Sullivan Mort et al., 2003). It “feels less tainted by the ‘dog-eat-dog’ and ‘at-all-costs’ focus that often characterises commercial enterprise” (Roberts & Woods, 2005). The primacy of this mission will be seen throughout the organization, for instance, in personnel motivation (Austin et al., 2006).

The dissimilarity may not be as great as has been suggested. Rather than

¹⁹As an example, consider the Committee for the Abolition of the Slave Trade, which was founded in 1787 but did not see their view accepted in the political process until the passage of the Slave Trade Act of 1807.

viewing ‘economic entrepreneurship’ and ‘social entrepreneurship’ as a dichotomy, Austin et al. (2006) and Emerson (as cited in Clark & Ucak, 2006, p. 8) argue for seeing them as two ends of a continuum. Alternately, the difference may come from other dimensions, of which the centrality of the social mission is but one (Sullivan Mort et al., 2003). For instance, social entrepreneurship could be considered a constrained optimization problem, where opportunity identification is limited by organizational sustainability, social mission, and environmental dynamics (Weerawardena & Sullivan Mort, 2006).

Parkinson and Howorth (2008) took the approach of examining the words used by practitioners, which were then compared with the British National Corpus of Spoken English and general entrepreneurs. The greatest difference was found between the standard language and social entrepreneurs on social, local, and human concepts. When contrasted with general entrepreneurs, social entrepreneurs were more likely to discuss groups/affiliations, obligations/necessity, government, helping/hindering, social actions and general work or employment concepts. They were much less likely to discuss the selling aspects of business. Furthermore, patterns in the portrayal of activity suggested that the process was more important than the method, outcome, or focus. A possible definition emerges from the findings:

The ideological and cultural meanings central to their social construction seem to centre around three main tenants: their position within the ideological struggle between local government and community; need-driven action, anchored firmly in the present and immediate past; and collective action for local change. (Parkinson & Howorth, 2008, p. 305)

Social entrepreneurship has also been contrasted with for-profit firms engaging in philanthropic or socially responsible activities and non-profit organizations

(Zahra et al., 2008). Exactly where social entrepreneurship fits amid similar concepts depends on the constraints of the original definition. For instance, Martin and Osberg (2007), proponents of the ‘catalytic change’ definition, contrast social entrepreneurship with ‘social service provision’ and ‘social activism’ as shown in figure 3.2 on page 41. In this model, social service provision refers to a small-scale socially beneficial action, such as creating a school for impoverished children, which would fall within the definition of social entrepreneurship adopted by this paper. Social activism relies on creating change through indirect action, by influencing others. An alternative which focuses on the relationship between social and economic intentions and results is provided by Neck et al. (2009) in figure 3.3 on page 41. Because the authors feel that “social entrepreneurship is determined by intended mission” (Neck et al., 2009, p. 16), both social purpose ventures and enterprising nonprofits are classified as social entrepreneurs.

3.2.2 Alternate Terms

There are other terms in use which correspond with common definitions of social entrepreneurship. *Social innovation*, like social entrepreneurship, has so many definitions that it is all but meaningless (Fu & Polzin, 2008). Mulgan et al. provided the following definition, which was adopted by Fu and Polzin: “innovative activities and services that are motivated by the goal of meeting a social need and that are predominately developed and diffused through organizations whose primary purposes are social” (as cited in Fu & Polzin, 2008, p. 5). The authors state that the distinction between business and social innovation is blurred when the innovative outcomes are the result of social entrepreneurship (where social entrepreneurship is seen as including an element of ‘catalytic change’). It appears that the definition of social innovation used by Fu and Polzin (2008) has much

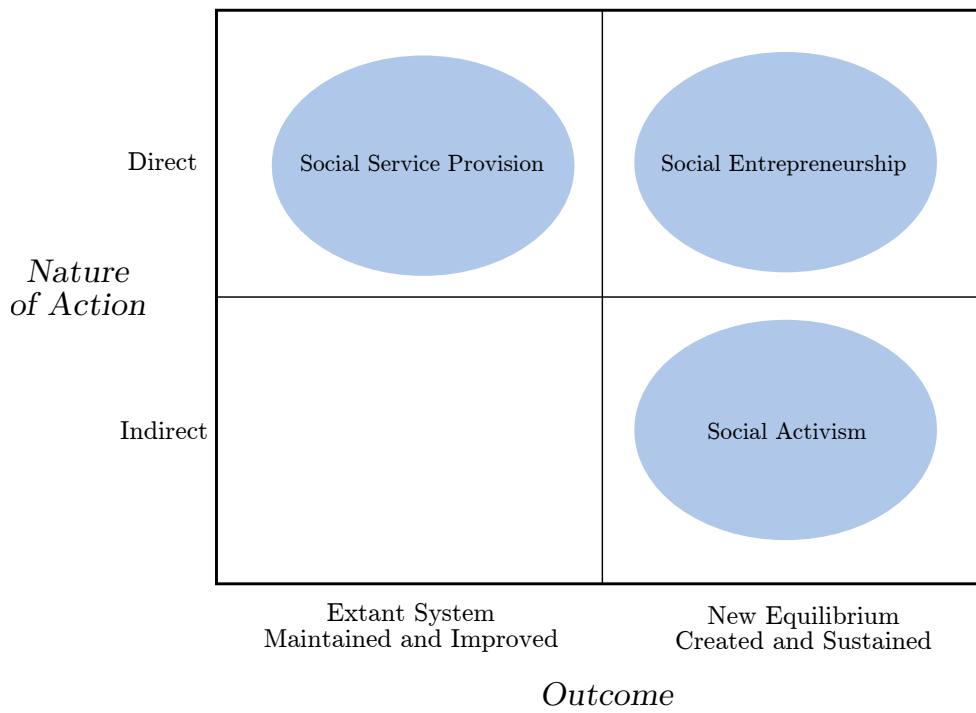


Figure 3.2: Forms of Social Engagement, Classified by Nature of Action and Outcome (Martin & Osberg, 2007, p. 38)

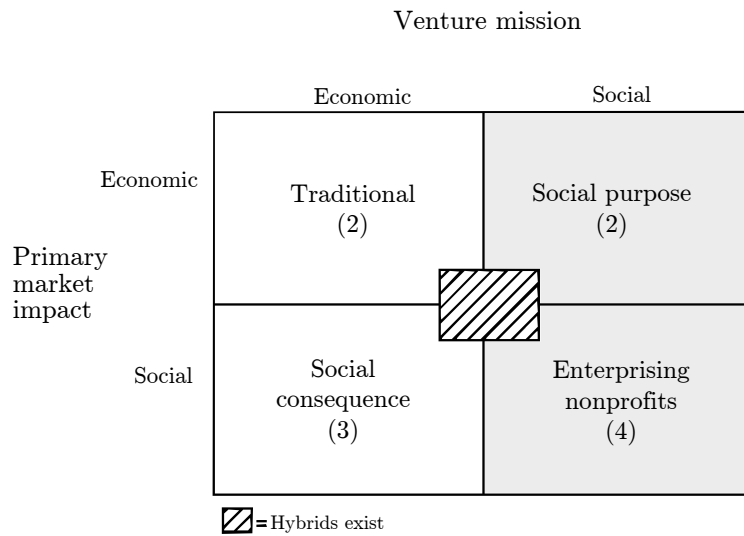


Figure 3.3: Forms of Social Engagement, Classified by Mission and Market Impact (Neck et al., 2009, p. 15)

	Equal or Socially Oriented	Financially oriented
Explicit to Customers	Activists	Market Pioneers
Not Explicit to Customers	Change Agents	Market Influencers

Figure 3.4: Forms of Social Venture CEO Types (based on Clark & Ucak, 2006, p. 8)

in common with the definition of social entrepreneurship adopted by this paper.

The *for-profit social venture* is described by Clark and Ucak (2006). It includes a commitment to creating positive social value as part of regular business practice, possesses an articulated definition of mission, uses specific operational practices as a means to create social value, and constantly redefines the pledge to promote social outcomes while remaining a successful, for-profit company. Within this framework, the authors describe four different types of social venture leaders, as depicted in figure 3.4 on page 42. The ‘activists,’ and to some extent the ‘change agents’ most closely correspond with social entrepreneurs.

3.2.3 Measuring Success

There are two words in ‘social entrepreneurship,’ both of which contribute towards the definition. It is only natural, therefore, that success should be measured by taking both social and economic performance into consideration (Zahra et al., 2008; Neck et al., 2009). Van de Ven argued that survival is the main mea-

sure of success (as cited in Sharir & Lerner, 2006, p. 8). The opposite approach has also been put forth. Economic value creation is a necessary condition for viability, but when it is not the primary focus of an organization, non-financial criteria may provide a more appropriate measure of success (Walker & Brown, 2004; Mair & Marí, 2006). Regardless of the weight each measure is given, there is difficulty in measuring the social side, which is not as straightforward as financial measures (Walker & Brown, 2004; Zahra et al., 2008): “The challenge of measuring social change is great due to nonquantifiability, multicausality, temporal dimensions, and perceptive differences of the social impact created” (Austin et al., 2006, p. 3).

One approach described in the literature is ‘total wealth,’ which has tangible (e.g., clients served) and intangible outcomes (e.g., happiness) (Zahra et al., 2008). The authors recommended the ‘total wealth’ standard as addressing both social and economic conditions, and providing information on how entrepreneurs may be able to shift resources between categories. However, such a concept is difficult to measure—as many of the products are non-quantifiable—and social value itself is subjective.

Sharir and Lerner (2006) proposed applying some of the criteria from pure business ventures to social entrepreneurship. Success could be assessed through three main considerations. First, the degree to which the stated aims are achieved is a component of success. Second, the ability of the company to ensure continuity and sustainability through acquiring sufficient resources to maintain operations is a necessary component. Third, the resources available for growth and development may indicate business strength.

It is clear that assessing the social impact and performance presents a great challenge (Mair & Marí, 2006), which complicates accountability and stakeholder

relations (Austin et al., 2006). It may be that social ventures need to identify their own non-financial metrics of success, either by industry, organization (Neck et al., 2009), or even project (Blake & Tucker, 2006). This corresponds with what has been observed in practice: social entrepreneurs are evaluating impact using a combination of targeted anecdotes and economic data (e.g., money saved by society as a result of their activities); social venture CEOs in software development and IT are more interested in evaluation than leaders in other sectors, but rely on anecdote rather than quantitative assessment (Clark & Ucak, 2006). It is important, however, not to look at social movements exclusively in terms of success or failure (Mair & Marí, 2006), as this may not consider the benefits created during the period of operation.

3.2.4 Determinants of Success

Researchers in the field of social entrepreneurship, like FLOSS researchers, have an interest in determining the key factors which contribute to the success of a social entrepreneurship (Sharir & Lerner, 2006). One view, advanced by Amit, Glosten and Muller, and Bygrave, is that success stems from the way the organization is structured, the environment in which it operates, and the actions of the business (as cited in Sharir & Lerner, 2006, p. 8). According to Edward, Piltz, Tropman, and Young, the challenges faced by social entrepreneurs are not dissimilar from those faced by business entrepreneurs (as cited in Sharir & Lerner, 2006, p. 7). Understanding what value is being created, and for whom, is fundamental (Neck et al., 2009). Yet the challenges of social entrepreneurs are not identical to those of other entrepreneurs. New social ventures must ensure that their funding sources are more interested in social than economic value (Certo & Miller, 2008). Also, social entrepreneurs must resist the demand for growth, and be deliberate

in planning a long-term impact strategy (Austin et al., 2006).

Absorptive capacity and complementary assets have been found to be determinants of sustainability for IT-enabled projects in developing nations (Fu & Polzin, 2008). While some of the requirements listed by Fu and Polzin (2008), such as basic computer literacy and reliable power networks, are likely to be taken for granted in developed countries, human capital has previously been identified as an important factor in technological entrepreneurship (Wright, Hmieleski, Siegel, & Ensley, 2007), as has the entrepreneur's primary social network (Mair & Mari, 2006; Sharir & Lerner, 2006). Positive motivation, or the dedication of entrepreneurs, is also essential, and prior experience in the same industry is helpful (Van Praag, 2003; Sharir & Lerner, 2006). Four other factors contributing to the success of the social enterprise are: the amount of budget at the establishment stage, the composition of the staff at the establishment stage, long-term cooperation with another organization, and the market test of the venture's service (Sharir & Lerner, 2006).

3.2.5 Perceptions of Free/Libre and Open Source Software

In section 3.1.3 the public perception of the relationship between FLOSS and the social good was described as being one where FLOSS enables socially desirable activities (e.g., Blake & Tucker, 2006; Fu & Polzin, 2008) such as poverty reduction. A more detailed examination of how FLOSS is viewed in social justice literature explains why prior literature has not addressed FLOSS in the context of social entrepreneurship.

FLOSS is seen as complementing the humanitarian sector because of its open,

transparent and grassroots approach; low costs; and adaptability to both local situations and hardware limitations (Currion, de Silva, & Van de Walle, 2007). Looking at the education sector, Carmichael and Honour (2002) saw shared values of peer review, distributed development, and communal responsibility, and suggested FLOSS could be valuable at avoiding lock-in and overcoming resource shortage in all nations, in addition to offering developing nations the additional benefit of building local capacity in software development. Developing nations could benefit not only from cost-savings and increases in human capital, but from independence, security and autonomy (Weber, 2003). Support can be localized, as opposed to being dependent on foreign providers, and communities can ‘own’ their development strategies because “F[L]OSS encourages an explicit social embeddedness in local communities” (May, 2006, p. 138). Nations, regardless of their current IT infrastructure, may also increase their ability to serve citizens equally through the use of FLOSS to ensure open standards (Simon, 2005). In all of these situations, FLOSS is seen as a means to an end.

Because Free Software is not recognized as a moral philosophy, it is seen primarily as a tool. The sole reference to it in social entrepreneurship literature identifies the potential for FLOSS to have a social aspect, but does not go so far as to suggest that it is a social good:

However Web 2.0 has also given rise to growth of a new voluntary/social economy, the prime example of which is probably Wikipedia, the free encyclopaedia created largely by volunteers. Open source software—also often created by volunteers—is another example.²⁰ (Leadbeater, 2007, p. 3)

²⁰This comment also betrays a lack of knowledge about FLOSS; web 2.0 is largely enabled by FLOSS, as opposed to being a major factor behind the rise of FLOSS.

3.2.6 Intersection with the Information Technology Sector

It is not only FLOSS which is absent from social entrepreneurship literature. Information technology companies have rarely been studied in this field (Fu & Polzin, 2008). The work of Clark and Ucak (2006) is the only research which was identified that explores the demographics and views of social entrepreneurs in the IT field²¹. Their work examined not only the social entrepreneur within the definition employed by this paper, but also other categories of ‘social venture CEO types’ as shown on figure 3.4 (page 42). The companies studied were young (with an average age of four years) and small, with 90% having 25 or fewer full-time staff. Of ventures that responded to inquiries about revenues, 20% had no revenue and the remainder had revenues of less than \$1 million. In this respect they resemble the Free Software companies studied in this paper, which were also largely young and small.

All the IT entrepreneurs studied agreed (69% strongly) that social ventures can grow without losing essential values (Clark & Ucak, 2006). This contrasts with the understanding of researchers. Austin et al. (2006) warned specifically of the dangers of growth, which has the potential to absorb resources and detract from the organization’s mission.

The entrepreneurs in the IT field studied by Clark and Ucak (2006) were also largely in favor of selling their companies, with 10% planning to do so within three years. The IT sector is in this regard similar to public energy, environmental technology and utility, and agriculture, health and food segments, but unlike

²¹It should also be viewed with some skepticism, as it is a business report rather than a peer-reviewed article, and, as such, is not always explicit in its claims, and provides little evidence of the findings reported.

financial, consulting and services, and media, education and communications. In the latter group, only 54% of respondents intended to sell their companies (Clark & Ucak, 2006). This understanding of social entrepreneurs working in IT conflicts with the common view towards takeovers within the FLOSS community. While it is realized that being acquired can bring in much-needed resources, community members worry that the Open Source nature of a project is at risk if it is purchased by a largely proprietary company (Bort, 2010). A recent headline about Oracle's purchase of Sun read: 'Users nervous about Oracle's acquisition of MySQL' (Krill, 2009); not that long ago, it might have stated: 'Canadian MySQL users sceptical of Sun takeover' (Schick, 2008).

The difference may be attributed to community reactions as compared to owners' views, although founders of FLOSS companies have been among those expressing concern at times (e.g., Widenius, 2009). Another possibility is that the work of Clark and Ucak (2006) also considers companies which do not fit within the definition of social entrepreneurs adopted by this paper. Only 15% of the sample considered social goals paramount²². The report is silent on the relationship between variables such as eagerness to sell and opinions on the primacy of social mission.

3.2.7 Conclusion

Social entrepreneurship is a relatively young field of research. There is a great deal of debate about the definition of the term and related terms; sometimes it is simply defined in relation to what it is not. Success is difficult to measure, and possibly even more difficult to achieve, although several factors which can

²²It should be noted that 60% considered social goals and financial success of equal importance.

contribute to the sustainability of a social entrepreneurship have been identified. Very little research has linked IT to social entrepreneurship, and the majority of it has looked at technology in the service of other socially beneficial activities. To date, social entrepreneurship has not been linked with FSi businesses, and only (slightly) to software produced in a FLOSS manner.

4

Research Design

4.1 Research Method

The purpose of this study is to examine how FSi business founders and owners perceive success, whether it can be linked to social entrepreneurship, and what practices which contribute to this success differ from practices of FLOSS businesses. An idiographic approach to information systems (IS) research was advised by Franz and Robey (as cited in Benbasat et al., 1987, p. 369) because the rapid pace of technological change in the IS field often leaves researchers in the position of studying practices which are already in place (Benbasat et al.). Understanding a phenomenon in its context and perceiving the situation from the perspective of the research subjects are approaches associated with Interpretivism (Cavaye, 1996). Interpretivism is becoming more widely accepted in IS case studies (Cavaye) as a means of comprehending what is important to the people being studied (Rubin & Rubin, 2005).

4.1.1 Topical scope

Analysis of data from sites such as Sourceforge is a popular technique among FLOSS researchers (e.g., Krishnamurthy (2005); Barahona et al. (2005); Bessen (2006)), but this technique is not suited to identifying practitioners' views on the nature of success. A survey would have been able to determine how likely it is for a Free Software business to be a social entrepreneurship, but could not create the understanding of how Free Software business owners define success. A large-scale, multi-phase survey along the lines of Ghosh et al. (2002) may have been able to address this question, but was rejected due to time constraints. Time constraints also necessitated a cross-sectional study.

Case studies are also widely used in FLOSS research (e.g., Pal and Madanmohan (2002); Hang et al. (2005); Vujovic and Ulhøi (2006); Rosén (2008)). A case study is appropriate when existing research does not adequately address the phenomenon in question (Eisenhardt, 1989; Cavaye, 1996; Eisenhardt & Graebner, 2007), or, according to Bonoma, when the experiences of participants and the context of the phenomenon are critical to understanding (as cited in Benbasat et al., 1987, p. 369). Case studies are viewed as strong in capturing 'reality' and detail, and allow a large number of variables (which have not been predetermined) to be examined (Cavaye, 1996). As has been noted, Free Software companies have not been the subject of academic inquiry. Thus a case study was deemed to offer the best opportunity for addressing the research questions.

Using multiple cases makes it possible to analyze data across cases (Cavaye, 1996) and, according to Yin, can provide a stronger base for theory building (as cited in Eisenhardt & Graebner, 2007). Increasing breadth may have a negative impact on depth (Dubois & Gadde, 2002), but as depth was already constrained¹,

¹Interactions with the companies were deliberately limited in order to increase the willingness

employing multiple cases was seen as a way of increasing the relevance of the research.

4.1.2 Limitations of Case Studies

Like all other forms of research, case studies have limitations. The case study permits generalization of theoretical propositions but is not statistically generalizable to a population (Cavaye, 1996; Blumberg, Cooper, & Schindler, 2008) and the lack of control over independent variables can restrict the internal validity of conclusions (Cavaye). Furthermore, with case research, it may be possible to establish a relationship between variables, but not to identify the direction of causation (Cavaye). The ‘force of example’ in furthering scientific development should not be underestimated, however; practical knowledge can be just as valuable as theoretical knowledge (Flyvbjerg, 2006).

Contextualizing events within their social and historic context is one of the principles of Interpretivist research (Klein & Myers, 1999). Information about context in which FLOSS companies operate is readily available, and is not explored in this paper, primarily because it has been so frequently described in the last decade’s worth of literature that a certain degree of familiarity with the material is assumed.

Another concern is fundamental attribution bias, which is a risk commonly found when dealing primarily with self-reported information. Research has shown that entrepreneurs self-reporting on factors contributing to the success or failure of the business are affected by self-serving bias and actor-observer bias (Rogoff, Lee, & Suh, 2004). This potential issue can be dealt with by applying the principles of multiple interpretations and suspicion recommended by Klein and Myers of subjects to participate in the research, on the advice of the original thesis supervisor.

(1999). According to Yin, using multiple sources of information “following a corroborative mode” creates a conclusion which is “much more convincing and accurate” (as cited in Dubois & Gadde, 2002, p. 556). As has been previously mentioned, few sources of additional information were available². Company websites (where available) were the most common secondary source.

Multiple interpretation could not be readily applied. However, there are several reasons why this is not a serious issue. The first research question focuses on the subjective opinion of the participant and how he defines success; the only point which could require external validation is the question of whether other company founders share the same approach. Obviously corroboration is unnecessary in one-person companies. Two of the other companies had websites which supported what was said by the primary source, and two further companies could be linked to published interviews (with either the primary subject or another person in the company). The second question relies on the self-reported assessment of how successful the company is, and a description of the company’s business practices, but does not ask participants to attribute the success or failure of the company to a particular factor. Trustworthiness is increased through comparison with the existing body of FLOSS literature (Thomas, 2003) and corroboration with the company website. Given the method used in selecting the sample, the company and individual would have to be actively engaged in deception to mislead on basic facts such as the company’s business model. Validity is achieved through credibility and the accuracy of description (Lin, 1998), which are present because the data is not prone to distortion, and the subjectivity of the participants is desirable.

²Participants were twice asked about internal documents and contacts with other people in the company, once in the interview and once in a follow-up mail. There was a very limited response to these requests, and attempts to contact other individuals in the company through addresses obtained in this manner were unsuccessful.

4.1.3 Analysis Method

Case studies can be used to describe phenomena, build theory, or test existing theory (Cavaye, 1996). Most IS case studies are exploratory, and seek to describe a phenomenon that is not well understood (Benbasat et al., 1987). This research falls somewhere between exploration and theory development.

One form of exploration is the narrative inquiries, as described by Flyvbjerg (2006). They do not start from explicit theoretical assumptions, but from an interest in a phenomenon. Inquiries develop from descriptions of the phenomenon from the perspective of participants, researchers, and others. In this approach, case studies are seen as valuable not because they can be linked to hypotheses, but because they allow for “the development of a nuanced view of reality, including the view that human behavior cannot be meaningfully understood as simply as the rule-governed acts found at the lowest levels of the learning process and in much theory” and increase the researcher’s expertise (Flyvbjerg, p. 223). Taking Lee’s (1991) concept of levels of comprehension, the researcher develops an interpretive understanding influenced by the participants’ subjective experiences. This research has the same starting point as a narrative inquiry, and aims to develop an interpretive understanding of FSi businesses, informed by a subjective view.

The reason this research may be seen as having elements of theory development is that the research questions could, if supported, become a theory about the nature of FSi businesses. The theory is not, however, built up from an examination of the data.

Theory-building is often accomplished through the formal approach of grounded theory (Eisenhardt & Graebner, 2007), which requires the researcher to enter the field with background knowledge from literature, but without *a priori* hypotheses

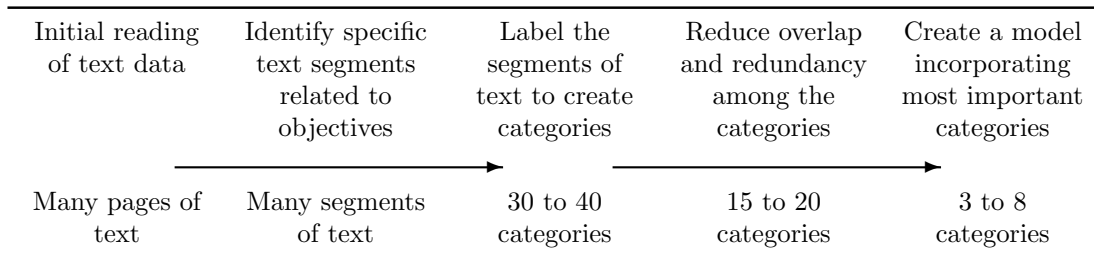


Figure 4.1: The Coding Process in Inductive Analysis (Thomas, 2006, p. 242)

(Cavaye, 1996). Given the researcher’s initial position of possessing a prior subjective understanding, but a limited knowledge of the literature, preconceptions (which the researcher wished to examine) on the topic were inevitable. Grounded theory simply could not be applied to the situation because of these limitations and the way in which the theory was expected to emerge.

Instead, what Thomas (2006) dubbed a ‘general inductive approach,’ and which other researchers have frequently left unnamed, was applied. In this approach, the analysis is guided by specific objectives and the purpose is to “allow research findings to emerge from the frequent, dominant or significant themes inherent in raw data” (Thomas, p. 238). Figure 4.1 demonstrates how the coding is performed.

4.1.4 Research Topic Development

Throughout the research process, the research questions were refined based on discussions with Free Software proponents and the reading of existing literature. The importance of the business model decreased, while the sense that the social entrepreneurship link might be novel increased. Campbell, Ragin, Geertz, Wieviorka, and others have reported that, contrary to the common belief, case material prompts the revision of hypotheses on essential points (as cited in Flyvbjerg, 2006, p. 235). Such a process can be observed in the evolution of the

central question of this paper. Data collection reinforced the relevance of social entrepreneurship—which inspired further study of social entrepreneurship literature—but greater knowledge of FLOSS literature revealed the futility of further exploring the initial topic of business models. This development demonstrates the application of the principle of dialogical reasoning, through sensitivity to ‘the story which the data tell’ (Klein & Myers, 1999).

The research questions which appeared in an earlier draft of the paper³, which evolved into the research questions found on page 3, were:

Irrespective of the business model, are there some common components of Free Software business plans which are found in successful businesses? What features can be incorporated by new companies to increase the likelihood of success? Are these features standard for all new businesses, or are they specific to Free Software businesses? Does a humanistic philosophy have an influence on the successful business model: are there parallels with social entrepreneurship, and could research on social entrepreneurship potentially be applied to Free Software businesses?

A successful conclusion to this research would determine whether or not a link between FSi business and social entrepreneurship is a valid subject of inquiry, and possibly answer in the positive whether including Free Software businesses in the broader study of FLOSS businesses is a cause for concern⁴.

³The earlier draft was written one year after the research was first proposed, and already showed a trend towards focusing on philosophical differences in FLOSS.

⁴It is not possible to conclude in the negative on the basis of this research.

Size	Viability	Identity	Model	Location
Medium	Active	FS (copyleft)	FS	Australasia
Micro	Inactive	FS (copyleft)	FS	North America
Micro	Active	FS (permissive)	OS	North America
Micro	Inactive	OS	OS	Asia
Small	Active	Pragmatic	FS	Europe
Micro	Starting	FS (copyleft)	FS	Europe
Micro	Active	FS (copyleft)	FS	Europe

Table 4.1: Company Values for Key Variables

4.2 Sample Design

Because case studies rely on replication logic, which means that the same phenomenon can be expected to occur if the same circumstances are observed (Blumberg et al., 2008), generalizability is increased through the strategic selection of cases (Flyvbjerg, 2006). Cases are chosen for their ability to fill theoretical categories and provide examples of polar types, rather than randomly selected (Eisenhardt, 1989; Patton, 1999). In case studies involving multiple cases, each individual case does not need to be unique; rather, the overall effect of the set of cases is considered (Eisenhardt & Graebner, 2007). In order to generalize about Free Software businesses, cases were chosen to reduce the impact of possible confounding factors. Four variables in particular were seen as potentially affecting the outcome: size of company⁵, whether the company was financially viable or not, the philosophical outlook (e.g., Open Source or Free Software), and the location of the company. At least two different values were explored for each of these four variables (see table 4.1).

Eisenhardt (1989) suggests that between four and ten cases is generally suffi-

⁵Where ‘micro’ is fewer than 10 employees, ‘small’ is 10–49, ‘medium’ is 50–249, and ‘large’ is over 250 (Vujovic & Uhløi, 2006).

cient. Seven companies were chosen as representing the best mix, out of a total of ten who responded to the initial request for participants. One of the seven study participants wished to remain anonymous. Although this condition resulted in the specifics of this case being reported with less detail, it was felt that the rarity of the situation being investigated⁶ merited its inclusion.

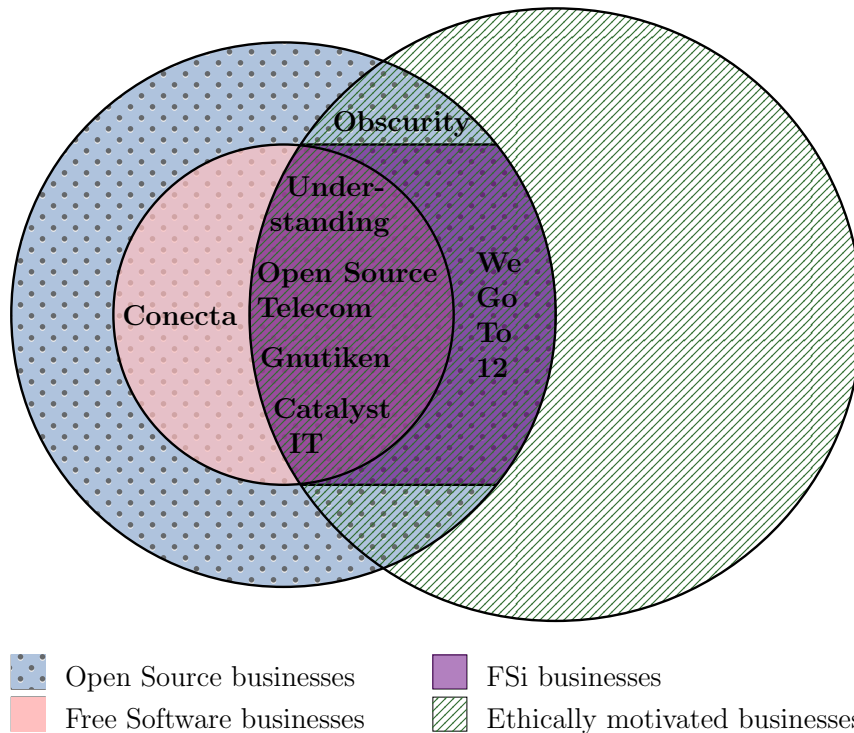
Some cases were chosen explicitly because they represent the boundaries of the study. One company is a Free Software business, but is not a FSi business; the founders have a more pragmatic approach. Another company has an Open Source philosophy, and has a belief in the principles of Open Source software: it could be dubbed an Open Source identified company. Finally, a third company is FSi, but does not fit within the definition of a Free Software company proposed by Daffara (2009b). The remaining four companies are both Free Software and FSi businesses. Figure 4.2 depicts the location of the companies in the context of the diagram introduced in figure 2.2. It is proposed that FLOSS social entrepreneurs fall in the area identified as FSi.

Potential participants were solicited through posts and emails to well-known Free Software mailing lists and forums, such as the Free Software Foundation's European mailing list. As the initial postings triggered an adequate range of responses, no further effort was taken to increase interest⁷. While the possibility of self-selection bias was considered, there was no feasible alternative to identifying FSi companies (as opposed to FLOSS companies) because of the lack of a directory and the extensive use of the term Open Source over Free Software on

⁶Although financial failure may be a common occurrence, it is unusual for company owners to be willing to discuss it.

⁷C. Rossi and Bonaccorsi (2006) found that firms strongly committed to FLOSS were more likely to be willing to devote time to their research. In addition, the Free Software community as a whole has a demonstrated willingness to contribute toward public goods, and often extend their generosity to offer substantial support (Hang et al., 2005) to users. Therefore, the positive response, while anticipated, was nonetheless greatly appreciated.

Figure 4.2: Euler Diagram of FLOSS Businesses Including Cases



commercial websites, even among Free Software businesses.

The request for participants directed practitioners to a website set up for the purpose, where a form of initial screening questions was available. In addition to requesting information about the individual and the company, questions were asked about the number of employees, the year the company started, the number of years it had been in operation, whether it was financially successful, and what philosophy governed the business⁸.

4.3 Model

In order to determine if FSi companies can be seen as social entrepreneurships, it is necessary to look at the extent to which the companies studied can be defined

⁸The location of the company was determined by examining the company's website.

in terms of their dedication to a social mission. The promotion of the public good comes ahead of profit, although not before sustainability (Mair & Marí, 2006; Zahra et al., 2008). Social entrepreneurs display passion; they use “caring, compassionate and moral” language (Roberts & Woods, 2005, p. 47), referencing concepts such as helping, affiliations, and necessity (Parkinson & Howorth, 2008). Success is measured by mission and impact, or the extent to which goals are met and the company has the resources to continue and develop (Sharir & Lerner, 2006; Neck et al., 2009). This suggests two ways in which potential similarities between social entrepreneurs and Free Software companies can be explored. First, the FSi company’s *philosophy* can be examined to determine if practitioners are using terms associated with ethics, and display benevolent and/or ideological motivations. Second, the organization’s definition of *success* can be studied to ascertain if the promotion of the philosophy is seen as a necessary condition for success. There is little point in examining if the companies use the factors they name in a qualitative assessment of success, as anecdote is a widely used means (Clark & Ucak, 2006) of addressing the challenges inherent in measuring social impact (Austin et al., 2006). The vocabulary used by practitioners reveals their understandings of success and performance (Parkinson and Howorth).

The second question can be addressed through an examination of *business practices* and the *success* of the company. Prior FLOSS literature has been unable to effectuate a consensus on which business models are most successful (Daffara, 2009b). There have been a number of other proposed determinants of success, but no tested list of ‘best practices’ has been created. Although models have been proposed for assessing companies (e.g., Krishnamurthy, 2005; Rosén, 2008), these models have not been widely tested or adopted, and the format used for data collection does not lend itself to a strategic study of the company. Instead,

participants were invited to talk about various aspects of business—primarily revenue streams—in order to determine if the factors significantly overlapped with those described in the literature. Thus it is only possible to ascertain that there is a difference between Free Software and FLOSS businesses if practices are described in the cases but are not mentioned in the copious literature on success. The absence of factors in the cases could suggest either a difference or simply a lack of data.

The approach used in analysis is based on examining the three attributes named: the company’s overarching *philosophy*; its *business practices*; and its *success*, considered in light of the way success is measured within the company. Each company was first studied individually, then a conjoint analysis was performed in order to expose patterns.

4.4 Data

4.4.1 Data Collection

The case study incorporates multiple sources of evidence (Benbasat et al., 1987) such as interviews, documents, archives, and observation (Blumberg et al., 2008) in order to reduce the likelihood of errors linked to one particular method of data collection (Patton, 1999). Although an attempt was made to identify secondary resources such as articles and community discussions, it was in many cases not possible to find corroborating material. The primary source of information was a single interview⁹ with an individual who was identified as a (co-)founder or owner of the business.

⁹One person was interviewed a second time, as the company had not yet started operations at the time of the initial interview.

The primary interview was semi-structured and took approximately one hour. An initial list of questions was developed and reviewed by an experienced researcher. A list of these questions can be found in Appendix H. According to Merton, semi-structured interviews should start with a broad question and then use a series of specific questions to explore patterns which develop during the conversation (as cited in Rubin & Rubin, 2005, p. 4). Thus, the questions should be seen as a guideline rather than a script; in particular, sub questions were only asked if they were necessary to elicit further response from the subject. Participants were emailed a list of questions tailored to their specific situation (e.g., in past tense if the company was no longer operating) a few days before the interview.

Interviews were conducted by telephone because of geographic distance and a desire to limit costs. The interviews were digitally recorded and transcribed, then coded by the researcher, who is a member of the FLOSS community. The researcher's connection to the group and background influenced both the data collection and interpretation (Patton, 1999). Her prior understanding informed the expansion of concepts familiar to the community (e.g., the meaning of 'BSD-style license'). Participants were aware of the researcher's background and used jargon freely in their responses. The researcher's position also limited the degree to which interaction with participants challenged assumptions.

Interaction between researchers and subjects can lead to data being developed because of the relationship (Klein & Myers, 1999). Because the research involved little contact with subjects, the opportunities for this development were restricted. In addition, subjects appeared to be already self-aware of both their philosophy (which they are actively engaged in promoting) and understanding of what constitutes success. A further indication that the information already

existed—as opposed to being expressed for the first time through interaction with the researcher—is the fact that similar sentiments were evident on websites, in interviews, in participation on Free Software mailing lists, and (in one case) in prior conversations with the researcher¹⁰.

4.4.2 Data Analysis

Before the material was analyzed, it was coded in the manner described in figure 4.1 in section 4.1.3.

Coding of the material was done at a theme level in several steps. In the first stage, each unit of information¹¹ was inserted into a database. Interview questions which prompted the responses were ignored, unless they were necessary to understand the participant’s statement (e.g., if the respondent simply said, “yes”). At the same time, a brief summary of the content was written, and the text was given a *label*. The labels described the concepts of interest to the interviewer, some of which were linked to interview questions (Thomas, 2006), and some of which developed during a reading of the material. Labels were merged or split as later coding revealed deficiencies with earlier labels, and previously evaluated material was reconsidered in light of the changes. The list of labels was close to its present state by the second interview. A total of 17 labels were identified; a list of labels can be found in appendix J.

Next, each label was put in one of two *categories* relating to the two research questions. The categories were ‘business methods’ and ‘social entrepreneurship.’

The next step involved *in vivo themes*. The labeled entries were re-read,

¹⁰One participant was already known to the researcher, and had expressed views on social responsibility several times in the past.

¹¹Each unit was roughly one paragraph, but if multiple concepts were expressed in the same paragraph, each concept was treated separately.

and themes were identified. Quotations with the same label were read together (as opposed to being processed as they appeared in the source; all sources were combined). Each quotation was linked to one or more themes, with the language of the themes derived from the expressions used in the original text. Determining themes organically limits the extent to which preconceived notions about the data influence the emerging concepts (Lin, 1998). In total, 55 themes were identified. Where an overarching theme seemed to link several themes, a *meta theme* was specified. The meta theme used the researcher's terms to link themes. For instance, the themes 'FLOSS gives users power or rights' and 'Using FLOSS is educational' were among the themes grouped under the meta theme 'direct benefits.' An example of a completely coded unit of text can be found in appendix K.

Themes were *grouped* into three areas of interest: business practices, success, and philosophy. Between three and eight overarching categories are typically discovered in inductive studies (Thomas, 2006). These categories were compared with the research questions in order to create the model (described in section 4.3) which was used in the analysis phase. Because the topic under investigation is not closely related to any existing literature, this grouping scheme was not applied to the literature review, which used the categories already found in the literature.

After the coding was completed, a prototype analysis was performed. This was selected as the best way of considering text-based data from multiple cases in order to identify differences and similarities. The next chapter details the results of this analysis.

Due to the restrictions imposed by the academic process, it was not possible to increase the reliability of the results by involving additional researchers, for

instance by having another person also code the data. However, the faithfulness of the interpretation can also be tested through stakeholder checks, for instance by examining the reactions of members of the community being studied (Lin, 1998; Patton, 1999; Thomas, 2006), and to this end early drafts of the results were shared with members of the FLOSS community with the intention of soliciting feedback, which was incorporated into the final version of the paper.

5

Presentation of the Results

5.1 Internal Case Analysis

This section introduces the cases. Some background information about each company is provided; an overview of key facts of all companies can be found in Appendix I. Each case is then summarized in terms of its business practices, philosophy, and success.

All quotes in this section stem from personal interviews conducted as part of this research, unless otherwise stated.

5.1.1 Catalyst IT Limited

Catalyst IT Limited is a mid-sized company with five working directors. The primary interview was conducted with one of the founders, who is also a director: Don Christie. The company is located in New Zealand and has a mission to “be recognized as New Zealand’s pre-eminent open source solutions provider” (*Catalyst IT Limited: Company Website*, n.d., “About Us,” para. 1). It has been in business since 1997 and has more than 100 employees.

Philosophy

Catalyst IT Limited is explicit about its commitment to FLOSS on its website: “Our clients pay us for our expertise. We are averse to locking clients into our offerings, be that our skill set, or any intellectual property with our clients. We also do not charge for software components we may bring with us, to use in development projects” (*Catalyst IT Limited: Company Website*, n.d., “Clients,” para. 3). The company also hosts a mirror for the GNU/Linux kernel and Debian GNU/Linux distribution, backs the New Zealand Open Source awards, and supports Christie in his position as president of the New Zealand Open Source Society by allowing him to spend one day a week on this task. Open Source is not viewed as a business model by Catalyst IT Limited, but as a way for the company to engage the community and explore different opportunities (Lewis, 2007). Christie sees the company’s success as a living demonstration to the business world that FLOSS use is appropriate in business.

The company’s philosophy is seen throughout the organization, which Austin et al. (2006) suggested is the case for social entrepreneurs. For instance, developers spend roughly 20% of their total development time on R&D, which looks exclusively at FLOSS technologies. The recruitment process also looks for individuals who are already involved in FLOSS, and who are passionate about it.

The company is described as having a copyleft Free Software orientation. This philosophy was not present when the company was founded, although the founders did have other social motivations. Catalyst IT Limited initially adopted FLOSS in order to reduce licensing costs, but gradually arrived at a Free Software philosophy after observing the inherent unfairness of lock-in, which created “a relationship that was generally not a happy relationship even though it might have meant a lot of money going to the vendor.” Using FLOSS sends a message

to clients that the user's rights are protected in perpetuity.

FLOSS has more positive impacts on society. Clients who are informed about how and why FLOSS is being used to provide solutions will think more about collaboration and sharing in general, which has a positive impact on communities. Christie describes software as “an essential part of our infrastructure” and believes that it should be “freely available to maintain and review” (Lewis, 2007, “Is open source really free,” para. 6). A Free Software philosophy is just one part of the bigger picture of social justice for Christie, as “open source fits in with his wider interests ‘such as agricultural development, third world economics, and the idea of empowering people’” (Lewis, “Catalyst and open source,” para. 3).

Business Practices

Catalyst IT Limited's main business is a services model, which involves writing and enhancing software and contributes about 80% of total revenues. The company also offers other services: consulting, systems integration, application design and development, graphic and web design, mobile solutions, managed hosting, Open Source support and training. Due to its increasing involvement in Free Software, less of its work involves custom development from the ground up; instead, the company associates with and contributes to specific FLOSS software, such as Mahara and Drupal. Long-term support of systems it has developed is part of its competitive advantage, although support contracts only contribute about 20% of the company's total revenue. Support includes activities such as helpdesk, training, and consulting.

The company has many long-term clients which are aware of how FLOSS is used. Partnerships and joint ventures are also used, for instance in delivering on-line courseware. The client base is varied and includes large customers such

as InternetNZ (which manages the .nz top-level domain) and Telecom NZ, as well as government and education authorities. Reducing the barriers to technology which can help with educational outcomes is an area where the company has been especially active. Another major project involved designing, developing, and hosting the core electoral roll management system in its role as a supplier to the Chief Electoral Office’s election management system.

Success

Some of Catalyst IT Limited’s measures of success would not be unusual in any business. Profitability is a critical measure of success. The company also considers reputation, stability, growth, low employee turnover, attracting top talent, and the retention of clients. According to all of these measures, Catalyst IT Limited is successful.

Other measures of success are less common. Catalyst IT Limited wants Free Software to be seen as a credible choice, and for the company to be viewed as competent and serious. In addition, the company would be failing if it were not getting its message across, or making progress towards its goal of making “free and open software the preferred technology in New Zealand.”

5.1.2 Conecta

Conecta describes itself as “the only Italian firm that offers [FL]OSS software selection and open source software governance services. Conecta is a European-level research firm that provides a complete set of services to help companies and public administrations migrate to open source software in an easy and reliable way” (*Conecta: Company Website*, n.d.).

Conecta has 11 employees and was founded in 1995. Carlo Daffara was one

of three original partners and the primary source of information about Conecta. All the founders had previously worked in a research center¹.

Philosophy

The company uses the slogan: “Open source research: what you need, simply” (*Conecta: Company Website*, n.d.). Daffara describes the company founders as pragmatic: “I would say that no one shares an ethical view that Free Software is better [in the] Stallman sense.” FLOSS is a competitive advantage; it makes the company stand out.

FLOSS is seen as introducing innovation more quickly, and as superior and faster than proprietary software in some areas, such as performance computing. Software is essential to modern society in terms of enabling the creation of new products and markets. FLOSS can aid in this because it can be shared and improved upon. Conecta is a Free Software company, but it is not a FSi company.

Conecta’s objective is to help local and regional customers improve their IT systems. Its goal is to become one of the most important businesses consulting on FLOSS in the EU.

Business Practices

Conecta’s initial goal was to offer tools for network integration, training, and IT consulting, but within one year it was converted to a FLOSS company because most of its business came from companies looking for FLOSS solutions. Being a FLOSS company is a source of competitive advantage.

Conecta is involved in consulting, helping other companies to find the FLOSS package which best meets their needs. The company can also help clients find

¹Daffara’s work has previously been cited in this paper (e.g., Daffara (2009b)).

an appropriate support provider for training, documentation, and other services. In 1997 Conecta started a research department, which Daffara directs. Much of the research activity has been done for the European Commission. In 2007, the company spun off an Open Source consulting company in London, Conecta Research LTD. The research arm of the company has had a limited impact on several large organizations, creating awareness of FLOSS in UNESCO, the first European Commission on Open Source, and the United Nations.

Clients come from many different industry sectors, such as manufacturing, finance, and public administration. Work is contract-based, but Conecta has an extremely high retention rate and prefers long-term relationships. Customers include organizations, as well as large companies such as Pfizer. About half of the clients are found in the same region, with another 30% located in other parts of Italy, and 20% outside Italy. Conecta prefers to create new companies in other countries to expand into new markets.

The company makes small but unusual contributions to FLOSS, such as making new graphics in order to improve a software's professional appearance.

Success

Success is defined by profitability, growth, and impact on the market. Conecta is successful. Daffara also expressed an interest in customer satisfaction and being known in the FLOSS community. The latter is not a formal metric but the company has “someone who checks periodically to see that, for example, even if we have someone that is critic about something we have done or our work and so on, we have a way to engage and to explain and to prove what we do.”

5.1.3 Gnutiken

Gnutiken was founded in April 2009 by three people, but had not yet started operations at the time of the initial interview with Stian Eide. A second interview with Eide was conducted a few months later, while the business was still in the early stages of development.

Philosophy

Gnutiken is not only a FSi (copyleft) company, it is also a co-operative. Eide puts the Gnutiken's philosophy in the context of a wider movement of decentralization, fueled by public mistrust for companies which put profit first. "What we are trying to do, at least, is very revolutionary and part of a much bigger revolution."

Free Software has practical benefits, and can be used to save money and help organizations avoid lock-in. Its primary benefits, however, are social. Company founders share a "common belief that Free Software is very good and very essential for society" and have previous Free Software experience; for instance, Eide previously interned with the Free Software Foundation Europe. Eide believes that Free Software is an essential part of democratic information infrastructure: as society becomes more digital, Free Software is necessary to allow everyone to take part in society and engage in free communication. Free Software is "so important that everyone really should use it."

The company has clear goals about how it will operate: "In addition to doing business and providing ourselves with a salary, we shall a) work to promote Free Software and related ideas, such as openness, accessibility and cooperation, and b) work for more environmentally friendly IT solutions and a sustainable technological development. These goals are permanently inscribed in our constitution, and will guide every decision we make" (*Gnutiken - International GNU*

Cooperative Sweden, 2009, para. 2).

Business Practices

The company was founded as a cooperative (co-op). “As a cooperative, Gnutiken is not owned by anyone, but rather run by its members. Every major decision is made collectively...” (*Gnutiken - International GNU Cooperative Sweden*, 2009, para. 3). All work is shared, including tasks such as cleaning the building. One aspect of the consensus-based co-op model is that growth is not necessarily desirable. Eide does not want the co-op to grow beyond 9 people, although he envisions that it could remain small but enter into a federation with other co-ops to achieve larger objectives.

The company’s plans include selling “everything that relates to Free Software” through a webshop and a physical store (*Gnutiken - International GNU Cooperative Sweden*, 2009, para. 4), offering support on Free Software, and holding courses. Due to difficulties in finding hardware suppliers, and concerns about import regulations, this aspect of the business is being approached cautiously. Long-term support contracts will be pursued, and classes may be offered as part of these contracts, but also to the general public. Support will probably be the main form of revenue.

Gnutiken sees an opportunity in offering a physical location to get information about Free Software, and was inspired by regular newspaper reports about cities in Sweden which were planning on adopting Free Software. Although there are several companies offering services to large businesses, small businesses and organizations are often neglected. Clients would thus be small companies, other co-ops, and municipalities. Co-ops in particular are seen as ideal customers because they already share values with Gnutiken on the topic of cooperation.

Initially Gnutiken had hoped to get financing through organizations which provide guarantees for co-operatives, but this failed because Free Software was not understood:

Our contact person in one of the institutions had a meeting with us and she had brought their internal ideas person, and he didn't really know what Free Software was (and called it freeware) and it was kind of more difficult to convince him what it was since he had kind of a preconceived notion of it. So he essentially said, "It sounds very good, this freeware thing but if you only find a way to lock in your customers then you'll have a business."

However, Gnutiken was able to secure a private loan.

Success

Despite being a new company, Gnutiken has already served as a source of inspiration for other Swedish Free Software co-ops. There has been positive feedback, and the company is already collaborating with an organic food company. In the future, it may play a role in bringing Free Software to the notice of the public. The goal is to "create synergy between the Free Software community and the general public" and "show that it's all part of a sustainable ecosystem."

In order to succeed, Gnutiken needs to be self-supporting, provide a decent income for its members, and achieve the company's goals. Thus far, the company has gotten funding without marketing or press releases, and is working towards its goals. According to Eide, "I'd say that we are so far very successful."

5.1.4 Obscurity²

Obscurity was active from 2003 until 2009. It was founded by two developers, one of whom, Henry Smith³, was interviewed shortly after the dissolution of the company. Obscurity operated on two continents.

Philosophy

The company was based on an Open Source philosophy, which was seen as being a source of competitive advantage. FLOSS is seen as giving people the opportunity to become involved and understand the software, if they are so inclined. It is “educational, informative and empowering.” There was no interest in switching to a proprietary model.

The founders of the company have a particular interest in furthering education, and one of the objectives was to contribute 10% of profits toward advancing primary education for under-privileged individuals.

Business Practices

Obscurity used dual-licensing, and also offered support, warranties, and customization. The company looked into the possibility of partnering with hardware vendors in order to produce a stand-alone device using Obscurity’s hardware, but this never materialized. The company was not financially successful. There were only a few sales from consulting, but the company was primarily supported by the partners’ personal savings. External investment was sought but a suitable investor was not found.

²The details of this case have been altered in order to render the company and interview subject anonymous.

³Not his real name.

The company's clientele was geographically diverse, and operated in a number of different industries. Most were medium-sized, and had either year-long support contracts or hired Obscurity for consulting as needed.

Success

Obscurity was not a financial success, and was unable to make a profit or even sustain development. It was not able to make donations to the charity, which was a central part of its mission. Success was seen writing "extremely high quality software that would essentially earn a decent living for the two of us and give us something left over to invest in [primary education]." Of these goals, only the first was achieved: the software is something Smith can be proud of.

The company was closed due to the lack of revenue, health problems, and exhaustion. However, the software is still being kept alive by the founders, who continue working on it in their free time. The software is still used in production and users are happy with it. Smith feels that the company did have a limited impact on the FLOSS community. The software relied heavily on another piece of FLOSS software, and so the company in effect 'sponsored' him to contribute to the other project.

5.1.5 Open Source Telecom

Open Source Telecom operated from 1998 to 2004. At its zenith, about 20 people were involved, including half a dozen contractors. The primary interview was conducted with Rich Bodo, who was a founder of the company and held the titles of Managing Director and Vice President.

Philosophy

The word which comes up repeatedly in Bodo’s discussion of Free Software is ‘waste.’ The inefficiency that results from throwing away code, or from duplicating existing work is anathema. Free Software is seen as a way to “make the world less crappy and more efficient,” and this realization led to zealotry. Rich Bodo, a company founder, described the Open Source Telecom founders as “real Free Software bigots” and supporters of the Free Software Foundation. He describes Free Software as not only reducing waste, but as enabling the exchange of information and the creation of secure, superior software.

Bodo believes that Free Software should become standard industry practice, and the values of transparency and openness should spread throughout society. When people talk about Free Software, “those thoughts get spread; they’re memes, they have lives and help people think about transparency.” In addition to encouraging transparency, Free Software may make people think about sharing in other ways. Because driven people tend to influence those around them, and seek out ways to achieve their goals while earning a living, passion about Free Software influences others. According to Bodo, it’s important to be doing something worthwhile, and if you can make a business based on your beliefs work, it’s a great way to live.

Business Practices

Open Source Telecom developed and deployed GNU/Linux telecommunications equipment. The company was started when a CEO of a company which made GNU/Linux network appliances was interested in funding a telephony application for voice messaging (*David Sugar on GNU Bayonne*, 2005).

The company’s business plan involved reselling and delivering a turnkey piece

of hardware, and installation and application support for GNU Bayonne⁴. It was primarily a professional services company, despite the initial interest in ‘widget frosting.’ Bodo believes that the company would have been better off focusing on either the services or the sale of hardware.

The company marketed itself through its software: it had only a simple website, and received a steady flow of sales enquiries on the basis of the software. Open Source Telecom hoped to leverage its software in order to become the canonical source for service. The software’s primary advantage was that it was extremely flexible and could be integrated with existing web sites, but it wasn’t as reliable as other some other systems on the market. The quality was never sufficient for it to become the dominant product.

Open Source Telecom worked primarily with hourly- or project-based contracts. They had some repeat customers, and a few large clients, such as Sun Microsystems and Vodafone. The majority of their clients were small dotcoms which needed a telephony interface to their website. Some clients were Free Software enthusiasts, who worked as contractors on other projects and shared part of the work with Open Source Telecom.

Success

The company had financial difficulties for several reasons. The hardware was expensive (*David Sugar on GNU Bayonne*, 2005), initial investment was lost and no new investment was found because investors wanted a dotcom model, and clients were high maintenance and not prepared to spend much. Eventually, Bodo became tired of not making a decent living and the company went out of business in 2004. Some of the key mistakes Bodo identified were: being too

⁴GNU Bayonne is a scalable telecommunications application server.

easygoing in managing people, paying himself too little, undercapitalization, not focusing on the quality of the code, and a lack of qualified business advisors.

Although Open Source Telecom went out of business, it still had an impact. By being a competitor to other FLOSS projects, it improved the general quality of FLOSS telephony. The former employees continue to work with software and engage in entrepreneurial activities. Bodo sees Open Source Telecom as a learning experience: “We didn’t ruin our lives or anything. It actually was an interesting little adventure.” Every small contribution matters, even if it doesn’t have a lasting effect:

Any time somebody just uses a piece of open source software, even if you’re not writing one or starting a business, [if] you just downloaded, you’ve already helped that community. You will probably run into a bug or you’ll probably look for documentation or you’ll ask a question. And you’ve helped that community again. Any time you contribute software to a project, you bring people into Open Source software.

5.1.6 We Go To 12

We Go To 12 is a one-person company founded by David Grandinetti. It was founded in January, 2008.

Philosophy

The company was described as having a permissive perspective on Free Software. The moral impact of Free Software was stressed through an analogy to fairness as advocated by philosopher John Rawls in his theory of justice⁵. Free Software

⁵Rawls proposed that the morality of an action could be determined through the exercise of the veil of ignorance. In this approach, one imagines that society will be reorganized, but the

is a “way to make people look at things a little more fairly.” In addition to being a leveler by spreading best practices, Free Software promotes altruism, sharing, and collaboration.

Grandinetti described the Free Software license as anthropomorphising the software and imbuing it with rights of its own, in contrast to other types of licenses, which allow the owner to grant or restrict the rights of users.

The company contributes to Free Software by releasing code whenever it is legally possible, and by donating money if a customer forbids code release. Grandinetti attempts to guide startups towards adopting a Free Software approach. We Go To 12 is also involved in a project related to urban farming in order to aid refugees. Grandinetti notes that he enjoys being able to contribute not only intangibles. Because We Go To 12 sometimes creates proprietary software on behalf of clients, the company may fall outside the definition of a Free Software company. It is, however, a FSi company, and its business practices are consistent with the permissive Free Software philosophy held by its founder.

Business Practices

Although We Go To 12 is a one-person company, Grandinetti works with several other independent contractors in a virtual team. This type of horizontal partnership is recommended by Daffara (2009b) as a means for small FLOSS companies to accept larger contracts.

We Go To 12 accepts a wide variety of tasks: programming, market research, failed project audits, performing due diligence for prospective investors, prototyping, iPhone applications, and more. The company expanded from the original conception into the area of embedded electronics. The primary focus is working

rules must be determined from behind a veil of ignorance, where there is no awareness of what position one will hold once society is restructured.

with startups, and doing rapid prototyping. Much of the work is done at the customer's site. The vast majority of income comes from contracting jobs, with about 2 or 3% stemming from royalties. Revenue for 2008 was approximately 125,000 USD.

Customers of We Go To 12 are geographically widespread. Although Grandinetti is based in North America, he has had clients in England, France, and Sri Lanka. Clients range in size, from France Telecom to startups. Contract length is typically between a few days and a couple of months, but Grandinetti mentioned that he was planning to devote his time exclusively to a startup for the next year.

Grandinetti has no plans to expand the company at this point, and views it primarily as a way of branding his contracting work. He described himself as satisfied with the company's direction and expressed his strategy as one of gaining better clients and more perspectives. He questioned whether it would be possible for a rapid prototyping company to grow large without losing its way, and indicated that he would not like more than 10 to 12 people involved.

Success

Personal success is indistinguishable from company success. Grandinetti likes to work for a short period of time on projects and then move on, and enjoys learning new things. He also enjoys travel. Challenge, change, and balance were key words. This closely corresponds with the definition of success given by many small business owners (Walker & Brown, 2004). Sufficient time for research was seen as both a component of success and a necessity for future success. By contrast, financial success was viewed as a "side effect of any other success" and having very little to do with success itself.

According to both financial measures and Grandinetti's definition of success,

the company is successful. If he were no longer involved in interesting or innovative work, Grandinetti would view We Go To 12 as a failure.

Grandinetti offers the following advice to startups: “It’s not what software you’re using, or your intellectual property and patents. The secret sauce these days is the operations.” Keeping costs down, through running infrastructure on the cloud and using FLOSS software, is key to success.

5.1.7 Understanding Limited

Understanding Limited is effectively a single-person company which was founded by Dave Crossland with a friend (who is not actively involved in the company) in 2006.

Philosophy

The front page of the company’s website describes the four freedoms of Free Software and explains the difference between Free Software and Open Source (*Understanding Limited: Company Website*, n.d.). Crossland states an affiliation with the Free Software Foundation’s brand of Free Software.

Crossland describes his motivation as one of avoiding humdrum and of performing meaningful work by making a contribution to the Free Software movement: Understanding Limited “has always aspired to make some contribution to the Free Software movement.” “Working in a free society is important to us and we do not work with proprietary software. We hope that one day, neither will you” (*Understanding Limited: Company Website*, n.d., para. 3). The company’s impact is presently limited, but Crossland does advocate Free Software solutions to clients.

Free software is necessary to maintain a free society, given that many aspects

of society are becoming digital. Crossland continues to work in the IT field because he sees Free Software as making “an important social contribution.”

Business Practices

All of the company’s current business comes from short-term contract work which typically lasts a few months. Many of Understanding Limited’s customers are small local companies, but Crossland has also had larger clients such as BBC and ITV. GNU/Linux systems administration, web design, typographic design, programming, strategic consulting on Free Software and free culture, and ‘learning support’—workshops, lectures, and tutoring—are the services on offer (*Understanding Limited: Company Website*, n.d.).

However, Understanding Limited has plans to adopt a different business model. Crossland would like to start a global business of training and workshops in order to gather the capital to start a subscription-based business of font development. The fonts would be like Free Software, with the subscriptions funding continued development. This type of business model based on font production is currently untested.

Success

For Understanding Limited, Free Software is a component of success:

I am quite happy to simply see software existing as Free Software and the work that we produce has always been Free Software so in that regard then I also consider the company a success.

In economic terms, matching the income of a salaried employee is sufficient. With the font business, being able to employ two or more type designers fulltime would be a sign of success.

5.2 Cross-case Analysis

Most of the understanding of the companies' philosophies and definitions of success were developed through statements made in personal interviews. There are arguments for treating statements by company owners and founders as representing the perspective of the company. First, motivations of small companies are generally very similar to the motivations of individuals, according to Bonaccorsi and Rossi (as cited in M. A. Rossi, 2006, p. 38) and Walker and Brown (2004), and all but one of the companies studied can be described as small or micro. Second, but closely related to the first concept, is the fact that the size of the companies means that they are not beholden to shareholders⁶ (several companies reported rejecting funding because the motives of investors differed from the beliefs of the founders), and therefore the directors have more leeway in determining the strategy of the enterprise. Third, all interview subjects reported that their views were widely shared in the company, and secondary sources, such as political statements about Free Software on company websites, seemed to support linking individual ethics to the company's direction.

5.2.1 Philosophy

A number of themes relating to philosophy—beliefs and convictions—were identified. Table 5.1 on page 85 provides a summary of the frequency with which distinct themes were positively expressed, and should be seen as offering an overview to the discussion which follows. The vertical axis should be read as three different ways of dividing the companies: by size, by whether they are still in business or not, and by philosophy. These are the same divisions which were earlier made in

⁶When asked about other stakeholders, no subject made mention of financial obligations to other parties.

Theme	Company attribute								
	Size			Viable		Philosophy			
	<i>Med.</i>	<i>Small</i>	<i>Micro</i>	<i>Yes</i>	<i>No</i>	<i>FS</i> [†]	<i>FS</i> [‡]	<i>OS</i>	<i>Pragmatic</i>
Total	1	1	5	5	2	4	1	1	1
<i>Superiority of FLOSS</i>	1	1	2	3	1	2	1	0	1
<i>Direct benefits</i>	1	0	4	3	2	3	1	1	0
<i>Spillover effects</i>	1	0	1	1	1	2	0	0	0
<i>Social Good</i>	1	0	4	4	1	4	1	0	0
<i>Won't go proprietary</i>	1	1	5	5	2	4	1	1	1
<i>Identifies with FLOSS movement or ideals</i>	1	0	3	3	1	3	1	0	0
<i>Can be used in a supporting role of socially beneficial activities</i>	0	0	3	2	1	1	1	1	0
<i>Desire to spread FLOSS</i>	1	0	4	4	1	4	1	0	0
<i>Growth is not desirable</i>	0	0	2	2	0	1	1	0	0

†: copyleft ‡: permissive

Table 5.1: Frequency of Philosophical Themes

table 4.1 (page 57). The first four themes are meta themes, which group together similar concepts. Unlike themes, which draw upon words or phrases from the cases, meta themes reflect the researcher’s perspective. All concepts identified are shown in this table, either as themes or as meta themes. It should be noted that if a particular theme was not observed in a case, it was not necessarily absent; the data collection limits make it almost certain that a full picture is not provided. This table makes it clear that a number of themes are not exclusive to FSi companies, and that size and viability appear to have little relationship to philosophy.

Key Themes

Three themes in particular appear to define a boundary between FSi and FLOSS companies, namely: identification with the Free Software movement, desire to spread Free Software use, and perceiving Free Software as a social good.

Companies were identified as FSi if the primary research subject described the company as adhering to a Free Software philosophy. The self-reported philosophy supplied in the initial contact form was used as the basis for the ‘Identity’ column found in Appendix I. It was expected that initial identification with the Free Software movement’s objectives would be expressed in the data as an attribute which distinguished FSi companies from other FLOSS companies. Indeed, this was the case:

We were really very strongly supporting the Free Software Foundation. . . . We loved Linux, we loved Free Software. We loved the ideas of Open Source software, the exchange of information—freedom of information—that Open Source software seemed to offer. . . (Bodo)

In prior literature there is a tentatively-acknowledged link between being explicit about mission and concern for social outcomes (Parkinson & Howorth, 2008), although stated commitment is not always a sign of actual support (M. A. Rossi, 2006). An explicit mission is a required component of some definitions of social entrepreneurship (e.g., Dees, 1998), although not in the definition adopted by this research.

The desire to spread the use of Free Software is clearly found within the Free Software philosophy (Stallman, 2002). This objective was also explicitly mentioned in the FSi cases, e.g., an objective of making “Free and Open Source software the preferred technology in New Zealand” was stated by Christie. Such

large-scale goals appear to be specific to larger companies, perhaps because they are more likely to consider FLOSS in a strategic manner (Wichmann, 2002), and to recognize that their growth is linked to the growth of the FLOSS product category (Young, 1999; Krishnamurthy, 2005). The two smallest FSi companies focused more on their immediate environment, where they “advocate for Free Software solutions” among their customers, in the words of Crossland. Spreading Free Software can be seen as a further clarification of mission.

The question of what is socially beneficial cannot be left to the court of public opinion⁷, and, at any rate, IT development (which incorporates FLOSS as a means of achieving independence (Weber, 2003; May, 2006)) is increasingly being seen as complementary to, rather than exclusive to, other forms of development⁸ (May, 2006). The copyleft Free Software philosophy accords Free Software the status of a social good⁹ (Stallman, 2002). Thus, the most important philosophical theme relates to the association of Free Software with the public good, as without a social mission, a business is certainly not a social entrepreneurship (Sullivan Mort et al., 2003; Mair & Marí, 2006; Zahra et al., 2008).

This theme was observed in all the FSi companies and was not seen in the other two cases, although one noted the importance of software to modern society. The theme is illustrated by this quote from Crossland: “...the reason I continue to work in the IT industry is because I think Free Software contributes an important social contribution.”

As a meta theme, the social good of Free Software consists of multiple *in vivo* themes: leveling, having an innate value, being necessary, and making the world a better place. Helping people, and the necessity of Free Software, expressions fre-

⁷The problem with this approach is explained both in section 3.1.3 on page 20 and in section 3.2.1 starting on page 37.

⁸This view is described in more detail in section 3.2.5 (page 45).

⁹This aspect of Free Software philosophy is described more fully in section 3.1.3.

quently used by social entrepreneurs (Parkinson & Howorth, 2008), were evident in FSi¹⁰ companies. The leveling theme, seen in only one company, concerned Free Software's role in creating greater equality, and is somewhat related to the humanitarian sector's view of how FLOSS can be used to further social justice (e.g., May, 2006; Weber, 2003), except that it is seen as a quality of Free Software, as opposed to a use of Free Software. Passion was evident in statements such as: “[Free Software is] the most underrated way of saving the world, in my opinion” (Eide).

Other Themes

Two philosophical themes did not stem from Free Software philosophy. The first was the acceptance of FLOSS in a supporting role of other objectives. This perspective is widely found in the literature (e.g., Currion et al., 2007; Weber, 2003; May, 2006; Blake & Tucker, 2006). The identification of the potential for FLOSS to be used toward other social ends did not prevent it from also being seen as socially beneficial in its own right.

The second unrelated theme which developed was the opinion that growth is not necessarily desirable. This was seen in two micro FSi companies, but the opposite view—that growth is a component of success—was seen in the two largest companies (one of which is FSi). Growth is often avoided by small business owners (Walker & Brown, 2004), and may provide an explanation for this finding. Again, this appears to be unrelated to the research questions, but confirms that growth is not always a reliable indicator of success.

The remaining philosophical themes could be linked to FLOSS.

¹⁰The desire to help people was not exclusive to FSi companies, and was extremely prominent in the Obscurity case as well, but only the FSi businesses showed a desire to help through the medium of Free Software.

Spillover effects were brought up primarily in a non-viable FSi company. Themes were: ‘encourages sharing or collaboration’ ‘increases interest in transparency,’ ‘reducing software costs in the long run,’ and ‘leads to people thinking about freedom.’ An example is provided by Bodo: “I think [FLOSS] can help build communities, help us understand better how to collaborate and help us rediscover how to share with each other.”

FLOSS was described as having a number of direct benefits, such as empowering users, giving users freedom, and promoting learning. Freedom and the empowerment of users are both seen as objectives in Free Software philosophy¹¹ (Beppu, 2002; Stallman, 2002; Kuhn & Stallman, 2010). The educational aspects of FLOSS have been previously observed by Carmichael and Honour (2002) and others, and are implicit in view of FLOSS as following the academic tradition of peer review, as described initially by Stallman. An example of this theme is provided by Smith, who described his personal experience with the educational aspect of FLOSS:

And being able to get the source of things like GCC was magical. Until then the compiler was just a big mysterious thing which Borland did, or Microsoft did. And I had no real insight into how it functioned. And the fact that that changed when I started using Open Source software was very important to me personally.

This theme was found in all types of companies, and appeared to be seen as a positive aspect of FLOSS.

The technical superiority—or lack thereof—of FLOSS has been studied in detail (e.g., Stamelos, Angelis, Oikonomou, & Bleris, 2002), but is beyond the scope of this paper. What is of greater interest is perception: if companies believe

¹¹The empowerment of users in particular is more strongly expressed in the copyleft variant.

that FLOSS is better than proprietary software, this will influence their decisions regardless of whether it is superior by objective measures. FLOSS was widely perceived to be superior because it gives the user control, is faster and more efficient, and is technically superior.

All companies intended to continue as Open Source or Free Software companies. This accords with the prior literature on company motivations, which suggests that companies may be involved for either strategic reasons (Wichmann, 2002) or more ethical motivations (M. A. Rossi, 2006). The identification with FLOSS (or lack thereof) described earlier demonstrates that both reasons are involved.

Conclusion

A total of 21 themes in the philosophical group were identified, many of which fell into four meta themes. Several of the (meta) themes did not appear to be directly related to either the research question or the company variables previously identified as potentially relevant. These themes, however, did indicate that FLOSS was perceived as having numerous direct and indirect benefits for users and society. Three themes were strongly expressed in FSi companies and appeared to be exclusive to them: identification with Free Software philosophy, desire to spread the use of Free Software, and the perception of Free Software as a social good. Participants used compassionate and ethical language, and displayed conviction in the beneficial nature of their promotion of Free Software.

5.2.2 Business Practices

In this section the objective is to address the second research question and determine if there is anything fundamentally different about successful FSi company

business practices, as opposed to practices recommended for FLOSS firms in the prior literature. Suggestions from practitioners and researchers include brand management (Young, 1999; Feller & Fitzgerald, 2002; Spiller & Wichmann, 2002; O'Reilly, 2005; Deek & McHugh, 2008), positioning (Young), market research (Behlendorf, 1999), and collaboration (O'Reilly, 2005; Daffara, 2009b; Pal & Madanmohan, 2002), but advice is based primarily on anecdote. A combination of the lack of clear predictive factors and limited information about internal company workings¹² meant that all topics other than business models were approached in an exploratory manner. Thus, rather than asking about positioning, participants were queried about whether the company was founded with a particular niche in mind.

Themes

There were several themes which did not appear to vary regardless of whether the company was FSi or not. The business type was one such theme. Both companies which went out of business were product specialists, but product specialist is a common category (Daffara, 2009b), and three other companies in the study also used this business model.

Contract length, local versus distant customers, and client size also appeared to be randomly distributed. Customer industry sectors likewise varied widely and did not reveal any patterns. Whether the business model remained consistent, underwent a little change, or changed dramatically over the course of the company's lifespan also appeared unrelated to either viability or philosophy.

With revenue streams, the only trend was rather obvious: companies which were financially unsuccessful had insufficient revenue sources.

¹²The business practices provided the least opportunity for comparison with other sources of data.

The opportunities that the companies were founded to exploit could all be categorized as perceived gaps in the market, either in the quality and price of existing products, or in the absence of other companies offering solutions. While some companies clearly defined the opportunity, and others were more vague, this did not appear to be linked to the current level of success of the company. Perhaps the reason that product positioning did not appear as important as Young (1999) suggested is due to the fact that all of these companies were much smaller than the example he was using.

Strategy was the only meta theme where differences did not appear to be arbitrary. It would be an overstatement, however, to describe these themes as significant. The first theme of strategy was investment. Several companies sought investment, but ended up rejecting it because there was a poor alignment of interests between the company and the investor. Two of the companies had business plans which required initial heavy outlays of capital in order to acquire stock. Business models which are less dependent on carrying large quantities of equipment may be better able to withstand lack of funding, but in general, starting with personal capital versus debt capital does not impact a small business's chances of survival (Van Praag, 2003). Other companies did not mention investment, which is less likely to be required with other business models, because of the relatively low entry barriers for FLOSS products (O'Reilly, 1999; Bitzer & Schröder, 2006). These findings suggest not so much that there is a difference between FSi and non-FSi companies on the subject of investment, but that certain business models require greater access to funds than other models.

Another theme of strategy is differentiation. Wichmann (2002) and M. A. Rossi (2006) already proposed that companies might adopt FLOSS for competitive advantage. The two companies which were not FSi both mentioned that Open

Source was seen as a source of differentiation. The only time competitive advantage was mentioned by an FSi company was when Open Source Telecom spoke of the extreme flexibility and integration that they achieved with their own software. Another subject, whose company worked with a lot of startups, suggested that new companies (not specifically FSi companies) could best compete by reducing their operating costs, presumably, among other measures, through the use of FLOSS software. This is not to suggest that the founders of FSi companies cannot see Free Software as having a potential competitive advantage—it has been previously noted that moral motivations do not exclude more prosaic motives (Seelos & Mair, 2005; C. Rossi & Bonaccorsi, 2006; Choi et al., 2009)—but that the possibility is not forefront in their minds when they talk about Free Software¹³.

The strategy which was more likely to be mentioned by FSi companies (and was only mentioned by FSi companies) was that of ‘alignment of sympathies,’ which came up in all but one of the interviews. Grandinetti talked about being able to choose collaborators, selecting only those who “... don’t do this because they can make money out of it. They do this because they love it.” Clients becoming more like-minded through extended interactions was also mentioned. Being selective about clients, or seeking them out on the basis of shared values was another aspect of this theme, although the commonality did not always apply to Free Software: Gnutiken was interested in working with other co-ops. Selecting a certain type of client was not previously described as an element of FLOSS business, but it is also not necessarily a requirement for social entrepreneurship, with the closest concepts being the founder’s social network (Mair & Marí, 2006; Sharir & Lerner, 2006) and the operating environment (Sharir and Lerner) are

¹³Participants were not asked directly about what they saw as a source of competitive advantage, so references to competitive advantage arose at the participant’s initiative.

described as determinants of success. FSi companies may prefer to work with sympatico clients, but this is not a necessity. The definition of a FSi company as a business which “won’t take money from people who write software that’s not GPLed” (Bodo) was not how the participants saw their organizations.

Conclusion

Of all the themes discovered on the topic of business, there were no practices which appeared to significantly add to or contradict the existing body of FLOSS literature. FSi companies do appear to have slightly different values when it comes to their perceptions of competitive advantage and their choice of clients, but neither of these differences significantly re-defines business practices.

5.2.3 Success

Both the definition of success and whether the company was successful are of interest, but on non-financial metrics, most of the companies studied considered themselves successful. Therefore, this section focuses primarily on the definition of success.

Social entrepreneurships may often create their own assessments of success (Neck et al., 2009; Blake & Tucker, 2006) which incorporate both financial and non-financial measures of success (Sharir & Lerner, 2006). The participants described 16 themes, which fell into two meta themes: definition of success and motivations.

Key Themes

Ability to support philanthropic activities (contributing to the community without using the medium of Free Software) was mentioned by the ethically-motivated

Open Source company. Companies with a strong interest in social activities but which do not make these the center of their mission are not social entrepreneurs (Sullivan Mort et al., 2003), although they may be considered socially conscious.

Unsurprisingly, all respondents included financial considerations as a component of success. Financial success is critical in social entrepreneurship if the organization is to continue to fulfill its mission, but social objectives must be more important than profit (Zahra et al., 2008; Neck et al., 2009; Mair & Marí, 2006; Sharir & Lerner, 2006). There was a range of statements about the importance of the financial metric of success. On one end, words such as ‘sustainable’ and ‘decent’ income were used, while at the other, ‘profit’ was a key term. Owners of smaller companies were generally content if they experienced no opportunity costs, and made as much as they could have as an employee. By contrast, the larger companies—including one FSi company—felt that profit was a measure of success. At the other extreme, Grandinetti described money as not a way of gauging success, but as “a side effect of any other success that I have.”

A second criteria for social entrepreneurships is that descriptions of success must reference the mission and the extent to which goals are furthered (Sharir & Lerner, 2006). Achieving the company’s objectives, getting the message out, helping others, and continuing to use Free Software were cited as necessary for success. Crossland described Free Software as the primary measure of success—for any company:

And I would consider other companies which are not producing Free Software no matter how much revenue they’re making or the functional quality of the software that they’ve developed, I’m not sure I’d consider them successful, because they are proprietary.

Other Themes

Attracting top talent and achieving low staff turnover were mentioned by the largest company. It is likely that this is simply because it is a mid-sized company; companies with less than a dozen employees can still be staffed with individuals known to the founders. Attracting and retaining developers is also a measure proposed for FLOSS project evaluation (Crowston et al., 2006).

Personal satisfaction and flexibility are two key measures of success often cited by small business owners (Walker & Brown, 2004). Happiness, balance, time for reflection, interesting work, and innovative work can be viewed as lifestyle criteria. Interest in travel and appreciation of novelty were also mentioned. The fact that such factors were mentioned only by the smallest of the businesses, and had no link to other variables suggests that these goals are closely related to company size.

Quality was another theme. Young (1999) suggests that quality can increase chances of success in a commodity market. Code quality is a metric also proposed for evaluating FLOSS projects (Crowston et al., 2006). Both of the companies which mentioned quality are no longer in operation, but one had achieved high quality, while the other regretted not having concentrated enough on quality. It may be that companies which are financially unsuccessful think more about quality, or it may simply be the case that other companies did not feel the need to describe it.

Some of the definitions of success could be applied to any business. These themes include customer satisfaction, and reputation. It has been previously noted in both FLOSS and social entrepreneurship literature that many aspects of these businesses resemble traditional business (Sharir & Lerner, 2006; Young, 1999). User satisfaction is even proposed as a measurement for progress in FLOSS

projects (Crowston et al., 2006) These themes were found in the two largest companies. It seems likely that more business-oriented understandings of success are not common in small companies, which was previously observed by Walker and Brown (2004).

Growth is a measure of success which is most likely linked to size, Walker and Brown (2004) having previously noted that small companies may not find growth necessary. In social entrepreneurship literature, having resources available for growth is seen as a sign of health (Sharir & Lerner, 2006), but organizations are warned against pursuing growth for the sake of growth (Austin et al., 2006). The two largest companies saw growth as a sign of success; in Understanding Limited very modest growth objectives (two employees) were expressed. Two other companies described explicit reservations about growth related to concerns that essential values might be lost in the process¹⁴. This is in direct contrast with the findings of Clark and Ucak (2006), but reservations about this research have already been stated (in section 3.2.6, from page 47).

Conclusion

Measures of success which might appear in any company were observed sporadically, and primarily in larger companies, leading to the possibility that small business dynamics may be contributing to this difference. This possibility was strengthened by the inclusion of lifestyle metrics in the smallest companies.

Earning enough to support socially beneficial activities unrelated to FLOSS was a concept that came up in one non-FSi company. Interest in financial success was widespread, but some companies were interested in viability, while others expected profit. All FSi companies considered the furthering of mission and

¹⁴Reservations about growth were also described in section 5.2.1.

worthwhile work to be a necessary condition for success.

6

Discussion, Conclusion, and Limitations

6.1 Discussion

6.1.1 Identifying Free Software Companies as Social Entrepreneurships

The first research question was *Can the success of FSi companies be understood through the lens of social entrepreneurship?* It was examined by looking at whether FSi businesses displayed passion about Free Software, used moral and social terms, believed Free Software to be a social good, and treated furthering Free Software as a key objective and a necessary precondition for success.

The distinction between the FSi company and Free Software firm was demonstrated on the topic of the desire to spread Free Software and the perception of Free Software as a social good, while the latter theme was also a key difference between the ethically-motivated Open Source company and the FSi businesses.

It was clear that the companies which were studied which were FSi saw Free Software as fundamentally beneficial to society, and that Free Software use to achieve other socially desirable aims was not required to provoke this belief. This contrasted with the edge case of the ethically-motivated Open Source company, which found Open Source important, and attributed many benefits to it, but which considered its philanthropic activities as a perhaps more meaningful contribution to the betterment of society. The Free Software company which described its philosophy as pragmatic also described Free Software as having valuable qualities, but did not describe it as necessary for success (except in terms of competitive advantage), or as a social good.

The identification of FSi companies as social entrepreneurships was less certain, however, when it came to the relative importance of objectives. The largest FSi company appeared to rate profit highly, while other FSi companies were on more solid ground in seeing money as a requirement for sustainability, but in a clearly inferior position. It is not clear exactly how Catalyst IT Limited would rank its goals; the promotion of Free Software and profit appeared to be of equal importance. A second reason for supposing that Catalyst IT Limited may not be a social entrepreneurship is the fact that its Free Software mission developed over time, as opposed to being part of the reason for its founding.

Overall, the results give reason to suppose that at least FSi companies should be grouped as socially-motivated businesses, even if calling them social entrepreneurships overstates their dedication.

6.1.2 Successful Business Practices

The second research question asked *Do the practices of a successful FSi company differ from the practices of successful FLOSS businesses identified in earlier*

literature? The question was studied by examining the business practices of FSI companies in terms of whether they related to success and whether they differed from the prior literature on determinants of success for FLOSS businesses.

Because all companies considered themselves successful when it came to non-financial measures (with the exception of philanthropic objectives which depended upon financial success), financial success—which was probably what was intended in the discussion of success in the earlier literature—was treated as a binary variable in the evaluation of business practices.

The results of this portion of the study were disappointing but not unexpected: the futility of attempting to identify a set of principles related to success had already been determined, and in the absence of factors to test, any investigation into the differences in business practices was destined to be a stab in the dark. None of the findings give any cause for researchers to discontinue aggregating Free Software and Open Source businesses when evaluating business practices, despite the slight strategic differences which emerged. As this research was constructed in such a manner that the question could only be answered in the positive, the results can only be described as inconclusive. However, it is the researcher's personal belief that the use of the grouping term FLOSS is appropriate when business practices are examined, provided that attention is paid to incorporating non-financial metrics of success, preferably identified by the company in question.

6.2 Conclusion

In the last decade, FLOSS has gained academic recognition. Although recent literature acknowledges differences between the Open Source and Free Software movements, they are still grouped together. Free Software in particular has rarely

been addressed independently. This research examined whether FSi companies could be seen as social entrepreneurs, and whether Open Source and Free Software businesses have different characteristics.

Because the extant literature did not directly touch on either of these questions, a broad literature overview covered aspects of FLOSS and social entrepreneurship which bore some relation to the topics of interest. The review of FLOSS addressed the motivations of developers and companies, the Free Software philosophy, business models, and how success can be measured. The summary of social entrepreneurship literature dealt with the problems of defining social entrepreneurship, alternate terms in use, how success should be evaluated, ways in which the chances of success can be increased, how FLOSS is perceived, and the extent to which IT companies have previously been treated as social entrepreneurs.

Social entrepreneurs were defined by the primacy of their social missions. An explanation of Free Software philosophy demonstrated how a belief in the principles could lead to an individual identifying Free Software with the social good. The link between individual motivation and small company motivations was described. This led to a design for addressing the first research question, which considered the extent to which the companies were dedicated to furthering Free Software, and whether this was seen as an ethical action.

The approach to the second question involved an examination of the business practices and success of the companies, in order to determine the extent to which FSi businesses differed from the FLOSS businesses described in prior literature.

A multiple case study involving seven companies was selected as the best means of addressing the research questions. Two of the cases were edge cases, while the remainder fell firmly within the boundaries of the FSi definition, but

differed in other ways which were considered potentially relevant.

Case study data, primarily from personal interviews, was coded and analyzed in three groupings: philosophy, business practices, and success. Individual cases were analyzed before a cross-case analysis was performed.

The cross-case analysis revealed several relevant philosophical themes: identification with the Free Software movement, desire to spread Free Software use, and the perception of Free Software as a social good. Success was defined not only in financial terms, but also in terms of mission. Based on these results, it is evident that there are FSi companies, which can be differentiated from FLOSS and Free Software companies on the basis of convictions. The FSi companies which were studied described Free Software in terms of a social good, and had a strong sense of mission.

Results were much less conclusive on the question of business practices. There did not appear to be any difference in the business practices of Free Software companies and FLOSS companies, so long as the definition of success was not purely financial. Including personalized measures of success had previously been proposed by other researchers. There was no indication that it is problematic to group Free Software firms with Open Source firms when studying business practices.

These findings suggest that there may be some merit to future studies which explore FSi companies as social entrepreneurships. The application of social entrepreneurship literature has the potential to provide insight into the balance FSi companies must strike between social objectives and financial success. At the same time, the validity of studying FSi companies as FLOSS companies is not rejected.

6.3 Limitations and Suggestions for Further Research

Research cannot cover all aspects of all questions which arise, and this work is no exception. There were several limitations to the research which could provide opportunities for further research.

Firstly, this research was limited by the restricted quantity of secondary data, which not only lessened the extent to which findings could be confirmed, but reduced the richness of the case studies. This shortcoming was a consequence of the data collection method.

Secondly, because respondents were self-selected, there is the possibility that the results are biased. A broader study, which examined what percent of FLOSS firms could be classified as FSi, could discover whether the cases are representative. However, the findings suggest that this is not a serious problem, because the companies were not found to differ significantly in their business practices. The main point of distinction was beliefs, and it is these beliefs which define the FSi company as it is envisioned here.

Thirdly, this study looked almost exclusively at industrialized nations, where IT is established and has a high level of penetration. The findings cannot be applied to developing nations. The challenges which face FLOSS businesses in less industrialized countries are likely different. On one hand, individuals in such countries may be less concerned with the ideological distinctions between Free Software and Open Source, and may see IT as a less pressing need; on the other hand, the lack of an existing infrastructure built on proprietary software may create more opportunities, and FLOSS can allow independent national capacity to develop (May, 2006). Studies looking at FLOSS in South America and Africa

have focused not on business, but in the role of FLOSS in enabling government or non-profit objectives. FLOSS in a business context remains a topic for further research.

Fourthly, the inconclusive results on the topic of business practices, while not wholly unexpected, demonstrated the need for longitudinal studies. To date no research has attempted to follow a company from inception and catalog the trials and developments of the critical first few years. Such research would provide valuable information to people who are considering founding FLOSS businesses.

Fifthly, the link between FSi businesses and social entrepreneurships is based on reasoning introduced in section 3.1.3 on page 20. While the results of this study appear to uphold the conclusion reached through the use of logic, generalization of the results through quantitative research would strengthen (or weaken) the connection between FLOSS and social entrepreneurships. In particular, the premise that individuals who strongly identify with the goals of the Free Software movement see Free Software objectives as a social good could benefit from a quantitative examination to determine if this is a widespread belief. It would also be possible to perform a survey which combines the motivational questions posed by Ghosh et al. (2002) with questions designed to identify social entrepreneurships, in order to determine the extent of the overlap between ideological FLOSS motivations and socially-oriented businesses. Another alternative would be a comparison of the language used by FSi companies with FLOSS companies and social entrepreneurships, building upon the study by Parkinson and Howorth (2008).

Sixthly, the definition of social entrepreneurship which was employed in this research was deliberately limited to incorporate only concepts which could be tested with the available data. Future research could look at some of the as-

pects which are included in other definitions of social entrepreneurship, such as innovation and reinvestment of profits, although the catalytic change definition is obviously not applicable at this point.

A final suggestion for future research involves testing some of the social entrepreneurship concepts against FSi businesses. One possibility would be to consider the determinants of success—which seem to be more developed in social entrepreneurship literature than in FLOSS literature—described in section 3.2.4 (page 44) to see if these requirements also hold true for FSi businesses.

Appendix A Open Source Software Definition

Introduction

Open Source doesn't just mean access to the source code. The distribution terms of Open Source software must comply with the following criteria:

1. Free Redistribution

The license shall not restrict any party from selling or giving away the software as a component of an aggregate software distribution containing programs from several different sources. The license shall not require a royalty or other fee for such sale.

2. Source Code

The program must include source code, and must allow distribution in source code as well as compiled form. Where some form of a product is not distributed with source code, there must be a well-publicized means of obtaining the source code for no more than a reasonable reproduction cost preferably, downloading via the Internet without charge. The source code must be the preferred form in which a programmer would modify the program. Deliberately obfuscated source code is not allowed. Intermediate forms such as the output of a preprocessor or translator are not allowed.

3. Derived Works

The license must allow modifications and derived works, and must allow them to be distributed under the same terms as the license of the original software.

4. Integrity of The Author's Source Code

The license may restrict source-code from being distributed in modified form only if the license allows the distribution of "patch files" with the source code for the purpose of modifying the program at build time. The license must explicitly permit distribution of software built from modified source code. The license may require derived works to carry a different name or version number from the original software.

5. No Discrimination Against Persons or Groups

The license must not discriminate against any person or group of persons.

6. No Discrimination Against Fields of Endeavor

The license must not restrict anyone from making use of the program in a specific field of endeavor. For example, it may not restrict the program from being used in a business, or from being used for genetic research.

7. Distribution of License

The rights attached to the program must apply to all to whom the program is redistributed without the need for execution of an additional license by those parties.

8. License Must Not Be Specific to a Product

The rights attached to the program must not depend on the program's being part of a particular software distribution. If the program is extracted from that distribution and used or distributed within the terms of the program's license, all parties to whom the program is redistributed should have the same rights as those that are granted in conjunction with the original software distribution.

9. License Must Not Restrict Other Software

The license must not place restrictions on other software that is distributed along with the licensed software. For example, the license must not insist that all other programs distributed on the same medium must be Open Source software.

10. License Must Be Technology-Neutral

No provision of the license may be predicated on any individual technology or style of interface.

Source: the Open Source Initiative¹

¹Published at <http://www.opensource.org/docs/osd>, last accessed January 15, 2008.

Appendix B Free Software Definition (excerpt)

“*Free software*” is a matter of liberty, not price. To understand the concept, you should think of “*free*” as in “*free speech*,” not as in “*free beer*.”

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. Thus, you should be free to redistribute copies, either with or without modifications, either gratis or charging a fee for distribution, to anyone anywhere. Being free to do these things means (among other things) that you do not have to ask or pay for permission.

You should also have the freedom to make modifications and use them privately in your own work or play, without even mentioning that they exist. If you do publish your changes, you should not be required to notify anyone in particular, or in any particular way.

Source: the Free Software Foundation²

²Published at <http://www.fsf.org/licensing/essays/free-sw.html>, last accessed January 15, 2008. A list of licenses which comply with this definition can be found on the GNU website: <http://www.gnu.org/philosophy/license-list.html>.

Appendix C Selected Definitions of Social Entrepreneurship and Social Enterprise

Key-word	Type of Organization	Definition		
social value	Non-profit	“We define social entrepreneurship as a behavioral phenomenon expressed in a [not-for-profit] organization context aimed at delivering social value through the exploitation of perceived opportunities.”	(Weerawardena & Sullivan Mort, 2006, p. 21)	
catalytic change		“Social entrepreneurs are private sector citizens who play critical roles in bringing about ‘catalytic changes’ in the public sector agenda and the perception of certain social issues.”	(Waddock & Post, 1991, p. 393)	
social value	For profit	“Social enterprise is often defined as finding business and market based solutions to systemic social issues, such as social exclusion, long-term unemployment and sustainability. A social enterprise puts a higher premium on its social mission and its social returns which moderate the way it runs its business.”	(Leadbeater, 2007, p. 1-2)	
	For profit, Non-profit, and Government	“We define social entrepreneurship as innovative, social value creating activity that can occur within or across the nonprofit, business, or government sectors.”	(Austin et al., 2006, p. 2)	
	Not specified		“We propose that social entrepreneurship ‘encompasses the activities and processes undertaken to discover, define and exploit opportunities in order to enhance social wealth by creating new ventures or managing existing organizations in an innovative manner’.”	(Zahra et al., 2008, p. 1)
			“Social entrepreneurship creates new models for the provision of products and services that cater directly to basic human needs that remain unsatisfied by current economic or social institutions.”	(Seelos & Mair, 2005, p. 243-244)

		<p>“Social entrepreneurs play the role of change agents in the social sector, by:</p> <ul style="list-style-type: none"> • Adopting a mission to create and sustain social value (not just private value), • Recognizing and relentlessly pursuing new opportunities to serve that mission, • Engaging in a process of continuous innovation, adaptation, and learning, • Acting boldly without being limited by resources currently in hand, and • Exhibiting a heightened sense of accountability to the constituencies served and for the outcomes created” 	<p>(Dees, 1998, p. 4)</p>
<p>catalytic change</p>		<p>“We view social entrepreneurship broadly, as a process involving the innovative use and combination of resources to pursue opportunities to catalyze social change and/or address social needs.”</p>	<p>(Mair & Marí, 2006, p. 37)</p>
		<p>“A social entrepreneurship is a different kind of social leader who:</p> <ul style="list-style-type: none"> • Identifies and applies practical solutions to social problems by combining innovation, resourcefulness and opportunity. • Innovates by finding a new product, a new service, or a new approach to a social problem • Focuses first and foremost on social value creation and in that spirit, is willing to share openly the innovations and insights of the initiative with a view to its wider replication • Doesn’t wait to secure the resources before undertaking the catalytic innovation • Is fully accountable to the constituencies s/he serves • Resists being trapped by the constraints of ideology or discipline • Continuously refines and adapts approach in response to feedback • Has a vision, but also a well-thought out roadmap as to how to attain the goal” 	<p>Schwab Foundation for Social Entrepreneurship, (as cited in Danaher & Anteliz, 2004, p. 6; emphasis in original)</p>

Appendix D Timeline of Free and Open Source Software

Year	Event
1950s and 1960s	Software source code is distributed without restrictions in IBM and DEC user groups, ACM's Algorithms Section etc.
1969	Ken Thompson writes the first version of UNIX. Its source code is distributed freely throughout the seventies.
1978	Donald Knuth (Stanford) publishes \TeX as free software.
1979	Following AT&T's announcement to commercialize UNIX, UC Berkeley begins with the creation of its own version of UNIX, BSD (Berkeley Software Distribution). Eric Allmann, a student at UC Berkeley develops a program that routes messages between computers over ARPANET. It later evolves into Sendmail.
1983	Stallman publishes GNU Manifesto calling for Free Software, and establishes Free Software Foundation.
1991	Linus Torvalds publishes version 0.02 of a new UNIX variant that he calls Linux in a Minix newsgroup.
1994	Marc Ewing forms Red Hat Linux. It quickly becomes the leading Linux distributor. Bryan Sparks founds Caldera with backing by former Novell CEO Ray Noorda.
1998	Major software vendors, including Computer Associates, Corel, IBM, Informix, Interbase, Oracle, and Sybase, announce plans to port their products to Linux. Sun announces plans to release the source code for Java 2 to developers.
2000	More software companies such as Novell and Real release versions of their products which run on Linux.

Based on Hars and Ou (2002, p. 27).

Appendix E Taxonomy of Motivations in Literature

Category	Subcategory	Motivation	Paper Ref.	
Development				
Technological	Self-efficacy	To meet personal technological need	Feller & Fitzgerald (2002)	
		“Scratching an itch”	Raymond (2000)	
		Personal needs	Hars & Ou (2001)	
		Personal programming needs	Edwards (2001)	
		Improve software for one’s own use	Hertel et al. (2003)	
		Own use of improved software	Lerner & Tirole (2002)	
		Code needed for user need	Lakhani & Wolf (2003)	
		Direct need for software and/or improvements	Van Wendel de Joode et al. (2003)	
		Use value/need of [FL]OSS product functionality	Hann et al. (2004)	
		To exploit the efficiency of peer review	Feller & Fitzgerald (2002)	
		Get help in realizing a good idea for a software product	Ghosh et al. (2002)	
		Pragmatism	Facilitating daily work with software	Hertel et al. (2003)
	To work with “bleeding edge” technology		Feller & Fitzgerald (2002)	
	Control over technology		Von Krogh et al. (2003)	
	To exchange knowledge		Ghosh et al. (2002)	
	Solve a problem that could not be solved by proprietary software		Ghosh et al. (2002)	
	Economic	Corporate work place related	Benefits for developer’s firm	Lerner & Tirole (2002)
			Securing venture capital	Lerner & Tirole (2002)
			Work need	Lakhani & Wolf (2003)
Monetary		Make money	Ghosh et al. (2002)	
		To strike it rich through stock options	Feller & Fitzgerald (2002)	
		Revenues from related products and services	Hars & Ou (2001)	
		Improved payment	Hertel et al. (2003)	
		Alumni effect/reduced cost	Lerner & Tirole (2002)	
Economic pragmatism		Costs are low and benefits are high	Van Wendel de Joode et al. (2003)	
		Low opportunity cost, nothing to lose	Feller & Fitzgerald (2002)	
		“Might as well make it [FL]OS[S]”	Hars & Ou (2001)	
		Distribute unmarketable software products	Ghosh et al. (2002)	
			Career concerns	Hann et al. (2004)

	Career orientated	To gain future career benefits	Feller & Fitzgerald (2002)
		Self-marketing	Hars & Ou (2001)
		Career advantages	Hertel et al. (2003)
		Career incentives	Lerner & Tirole (2002)
		Improve my job opportunities	Ghosh et al. (2002)
		Enhance professional status	Lakhani & Wolf (2003)
		Accrued reputation	Moon & Sproull (2000)
	Skill acquisition & development	Improve programming skills	Lakhani & Wolf (2003)
		To improve coding skills	Feller & Fitzgerald (2002)
		Human capital	Hars & Ou (2001)
		Improving one's own programming skills	Hertel et al. (2003)
		Learn and develop new skills	Ghosh et al. (2002)
		Learning opportunities	Von Krogh et al. (2003)
		To learn and share what is known	Scacchi et al. (2006)
	Share knowledge and skills	Ghosh et al. (2002)	
Socio-political	Reputation	Gaining reputation	Hertel et al. (2003)
		Reputation	Kollock (1999)
		Reputational benefits	Lerner & Tirole (2002)
		Reputation among hackers	Raymond (2000)
		Get a reputation in OS/FS Community	Ghosh et al. (2002)
		Enhance reputation in F/OSS community	Lakhani & Wolf (2003)
		Recognition of work	Moon & Sproull (2000)
		Recognition as trustworthy and reputable contributors	Scacchi et al. (2006)
		Reputation	Von Krogh et al. (2003)
		Reputation/garner stature within [FL]OSS Community	Hann et al. (2004)
		Influence and reputation/intrinsic reward logic	Edwards (2001)
	Identification	Following other members/ membership herding	Oh & Jeon (2004)
		Community Identification	Hars & Ou (2001)
		General Identification as Linux developer	Hertel et al. (2003)
		Like working with this development team	Lakhani & Wolf (2003)
	Commitment /reciprocity	Rewards from collective action	Von Krogh et al. (2003)
		Expecting Reciprocity	Moon & Sproull (2000)
		Reciprocity	Kollock (1999)
		Feel personal obligation to contribute because use F/OSS	Lakhani & Wolf (2003)
		Commitment & reciprocity	O'Mahony & Ferraro (2004)
	Social reward	Sense of belonging to a community	Feller & Fitzgerald (2002)
		Attachment to community	Kollock (1999)
		Peer Recognition	Hars & Ou (2001)
		Ego-satisfying piece of the action	Raymond (2000)

	Self gratification	Ego gratification and signaling incentives	Feller & Fitzgerald (2002)
		Satisfaction and fulfillment	Hars & Ou (2001)
		Self-efficacy	Kollock (1999)
		Personal satisfaction	Gacek & Arief (2004)
	Hedonistic	Hobby	Edwards (2001)
		Enjoying the work	Scacchi et al. (2006)
		Intrinsic motivation of coding	Feller & Fitzgerald (2002)
		Fun to program	Hars & Ou (2001)
		Enjoyment of the work itself	Van Wendel de Joode et al. (2003)
		Having fun programming	Torvalds & Diamond (2001)
		Intrinsic pleasure/for the joy of it	Moon & Sproull (2000)
	Leadership	Code for project is intellectually stimulating to write	Lakhani & Wolf (2003)
		Being own Boss	Lerner & Tirole (2002)
	Altruism	Leading a community/project	Lerner & Tirole (2002)
		Altruism	Feller & Fitzgerald (2002)
		Altruistic values	Hars & Ou (2001)
	Adversarial	Improve OS/FS products for other developers	Ghosh et al. (2002)
		Competitiveness with other developers and/or projects.	Bezroukov (1999)
		Limit the power of large software companies	Ghosh et al. (2002)
	Idealism	Dislike proprietary software and want to defeat them	Lakhani & Wolf (2003)
		[FL]OS[S] Idealism	Hars & Ou (2001)
		Software should be free	Hertel et al. (2003)
		Think that software should not be a proprietary good	Ghosh et al. (2002)
		Belief in Free Software	Elliot (2005)
		Believe that source code should be open	Lakhani & Wolf (2003)
		Software's Openness	Gacek & Arief (2004)
		Being part of a social movement	Von Krogh et al. (2003)
	Social	Participate in a new form of co-operation/in the OS/FS scene	Ghosh et al. (2002)
Social networking		Hars & Ou (2001)	
Personal exchange		Hertel et al. (2003)	
Technological	To take part in the main communications and discussion	Ghosh et al. (2002)	
	Non-Developer /Support		
	Pragmatism	Primary means to get product feedback and updates	Sowe et al. (2006)
To use code		Van Wendel de Joode et al. (2003)	
To be notified of things happening in the community		Van Wendel de Joode et al. (2003)	

		Easy access to software	Van Wendel de Joode et al. (2003)
	Support provision	Provide support because I have experience in this area	Lakhani & von Hippel (2003)
		Provide support because I am the authority in this area	Lakhani & von Hippel (2003)
		Answer questions relating to packages I maintain	Sowe et al. (2006)
		Answer questions relating to other packages	Sowe et al. (2006)
		Answer questions relating to my specialized area	Sowe et al. (2006)
		To provide the best answer to a question	Lakhani & von Hippel (2003)
		Obtaining support	Getting help with critical problems	Lakhani & von Hippel (2003)
	Reporting a problem with favourite software		Edwards (2001)
	Reporting a bug or problem		Van Wendel de Joode et al. (2003)
	Participate in development discussions		Von Krogh et al. (2003)
Economic	Career orientated	I answer to enhance my career prospects	Lakhani & von Hippel (2003)
		I answer because it's my job	Lakhani & von Hippel (2003)
		Learning opportunities from lurking	Von Krogh et al. (2003)
		Free download of software	Van Wendel de Joode et al. (2003)
		To learn about [FL]OS[S] for corporate needs	Van Wendel de Joode et al. (2003)
Socio-political	Identification/ Reputation	Community identification	Hertel et al. (2003)
		To gain reputation	Lakhani & von Hippel (2003)
		General identification as Linux user	Hertel et al. (2003)
	Social reward	Copying the behaviour of others with good reputation	Van Wendel de Joode et al. (2003)
		Involvement in meritocracy	O'Mahony & Ferraro (2004)
	Idealism	Supporting software and community	Hertel et al. (2003)
		Promotion of [FL]OSS	Lakhani & von Hippel (2003)
	Support reciprocity	Expecting reciprocity (I help so I will be helped)	Lakhani & von Hippel (2003)
		I was helped so I help	Lakhani & von Hippel (2003)
	Hedonism	I answer because it's fun	Lakhani & von Hippel (2003)
		Intrinsic motivation of answering questions	Lakhani & von Hippel (2003)

Source: Schofield and Cooper (2008, pp. 72-76)

Appendix F Revenue Sources of FLOSS Businesses (Selected Authors)

(Daffara, 2010)	(Dahlander & Magnusson, 2006)	(Stallman, 1999)	(Krishnamurthy, 2005)	(O'Mahony, 2005)	(Behlendorf, 1999)	(Feller & Fitzgerald, 2002)	(Luthiger & Jungwirth, 2008)	(Deek & McHugh, 2008)	
Selection /consulting companies				complementary services		bringing together developers and companies	mediators	consulting on [FL]OSS	
aggregate support providers	services	support	The Distributor: upgrade services		maintenance	FLOSS-enabling existing software	support sellers		
			The Distributor: support services to enterprise customers		support	Support and Training			
			Third Party Service Provider						
training and documentation		printed manuals (with freedom to redistribute and modify)							
	education	teaching							
legal certification and consulting							certification		

(Daffara, 2010)	(Dahlander & Magnusson, 2006)	(Stallman, 1999)	(Krishnamurthy, 2005)	(O'Mahony, 2005)	(Behlendorf, 1999)	(Feller & Fitzgerald, 2002)	(Luthiger & Jungwirth, 2008)	(Deek & McHugh, 2008)
product specialist	integrate [FL]OSS according to customer needs	porting	The Software Producer (GPL model)	complementary software	porting, integration with existing proprietary software	OEM: optimization of [FL]OSS products for particular platforms		consulting on [FL]OSS
	build different types of solutions	deluxe distributions (whole collection built for choice of platform)				VARs: integration specialist		
platform providers			bundling					providing [FL]OSS distributions
open core	combining/bundling with proprietary software		The Software Producer (Non-GPL model)			OEM: production of [FL]OSS device drivers		vertical development with [FL]OSS
dual license	dual licensing				technology "sentinel" (charge for embedding or redistribution for profit)		dual licensing	dual licensing

	(Daffara, 2010)	(Dahlander & Magnusson, 2006)	(Stallman, 1999)	(Krishnamurthy, 2005)	(O'Mahony, 2005)	(Behlendorf, 1999)	(Feller & Fitzgerald, 2002)	(Luthiger & Jungwirth, 2008)	(Deek & McHugh, 2008)
	.....	.....	.....	.....	.....	..... commercially license a separate branch	.....	..... sell it, free it (free older versions of software)	.....
R&D cost sharing									horizontal arrange- ments
indirect revenues					complemen- tary hardware		OEM: system vending (sell hardware, give away software)	widget frosting	
								service enabler (sells a service online and needs software so that users can access the server)	
	give away product for free to build reputation in order to sell services							loss leader (application is given away as Open Source software to improve the company's position in the software market)	

(Daffara, 2010)	(Dahlander & Magnusson, 2006)	(Stallman, 1999)	(Krishnamurthy, 2005)	(O'Mahony, 2005)	(Behlendorf, 1999)	(Feller & Fitzgerald, 2002)	(Luthiger & Jungwirth, 2008)	(Deek & McHugh, 2008)
.....	.....	.....	.....	.....	.....	.....	..... standard creation (company uses Open Source in order to promote a technical standard)	.....
						selling accessories	accessorizing	
		launching new Free Software products					Open Source application provider (software is created and distributed under an Open Source license)	
		selling CD-ROMs with source code or binaries	The Distributor: Providing the product on CD			selling FLOSS products		

Appendix G Summary of Concepts for Information Systems Success in FLOSS Context

Process phase	Measure	Potential indicators
System creation and maintenance	Activity/effort	File releases, CVS check-ins, mailing list discussions, tracker discussions, surveys of time invested
	Attraction and retention of developers (developer satisfaction)	Size, growth and tenure of development team through examination of registration, CVS logs. Posts to dev. mailing lists and trackers. Skill coverage of development team. Surveys of satisfaction and enjoyment
	Advancement of project status	Release numbers or alpha, beta, mature self-assessment, request for enhancements implemented
	Task completion	Time to fix bugs, implementing requests, meeting requirements (e.g. J2EE specification). Time between releases
	Programmer productivity	Lines of code per programmer, surveys of programmer effort
	Development of stable processes and their adoption	Documentation and discussion of processes, rendering of processes into collaborative tools, naming of processes, adoption by other projects/endeavors
System quality	Code quality	Code analysis metrics from software engineering (modularity, correctness, coupling, complexity)
	Manageability	Time to productivity of new developers, amount of code abandonment
	Documentation quality	Use of documentation, user studies and surveys
System use	User Satisfaction	User ratings, opinions on mailing lists, user surveys
	Number of users	Surveys (e.g. Debian popularity contest), downloads, inclusion in distributions, package dependencies, reuse of code
	Interest	Site pageviews, porting of code to other platforms, development of competing products or spin-offs
	Support effectiveness	Number of questions effectively answered, time required to assist newbies

Appendix G: Summary of Concepts for Information Systems Success in FLOSS Context

	Economic implications	Implementation studies, e.g. total cost of ownership, case studies of enablement
System consequences	Knowledge creation	Documentation of processes, creation of tools
	Learning by developers	Surveys and learning episode studies
	Future income and opportunities for participants	Longitudinal surveys
	Removal of competitors	Open sourcing (or substantial feature improvement) of competing proprietary applications

Source: Crowston et al. (2006, p. 135)

Appendix H Initial Interview Questions

Information about you

- When did you join or found the company?
- What is your role in the company?

Personal beliefs about FLOSS

I'd like to start with some questions about your personal beliefs about Free and Open Source software.

- What is your opinion of the role of Free and Open Source software in society?
- To what extent do your views represent the views of others in the company?
- What impact does your company have on society?
 - What is the company's relationship with Free and Open Source software communities?
 - What is the company's relationship outside of Free and Open Source software communities, for instance to the city where it is located?
- What does the *<as specified Free or Open Source software model>* mean to you?

Business model

Now I would like to discuss your business model.

- What is the company's business model?
 - What was the company's original business model?
 - * What were the goals and aspirations for the company when it was founded?
 - * Was there any particular niche or opportunity the company was founded to exploit?
 - Do you feel that the company is going in the right direction?
 - * What changes would you make to the business model?
- Please describe the company's sources of revenue.
- Who are the company's clients?
 - What is the relationship with the clients? (partnership, contract-based)

Success factors

Next, I would like to talk about success.

- How do you define success?

Business model and success

- Is the company successful?
 - Is the company successful in your own eyes?
 - How does the company measure success to different stakeholders?
 - Under what circumstances would the company be said to be failing?
 - How financially successful is the company?
- Has the company ever considered switching to a proprietary software business model?

Appendix I Overview of Companies Studied

Company	Employees	Years active	Identity	Business Model	Location	Business Type ³
Catalyst IT Limited	> 100	1997 – present	Free Software (copyleft) now; originally none	Free Software	Australasia	Aggregate support provider, Product specialist
Open Source Telecom	~ 6	1998 – 2004	Free Software (copyleft)	Free Software	N. America	Indirect revenues (hardware sales), Product specialist
We Go To 12	1	2008 – present	Free Software (permissive)	Open Source	N. America	Product specialist, Selection/consulting
Obscurity	< 5	2003 – 2009	Open Source	Open Source	Asia	Dual license, Product specialist, Aggregate support providers
Conecta	11	1995 – present	Pragmatism	Free Software	Europe	Selection/consulting, Indirect revenues (research)
Gnutiken	3	2009 – present	Free Software (copyleft), Co-op	Free Software	Europe	Indirect revenues (physical inventory), Training and documentation, Aggregate support providers
Understanding Limited	1	2006 – present	Free Software (copyleft)	Free Software	Europe	Product specialist, <i>Training and documentation planned</i>

³Based on the categories used by Daffara (2010), which are also listed in appendix F.

Appendix J Database Table ‘Label’

code	description
moneysuccess	Has the company been a financial success?
bizsuccess	Has the company been successful according to your definition of success?
defFLOSS	How do you define free software, open source, a FLOSS company, etc.?
advice	To what do you attribute the success or failure of the company?
companyvals	What are the values held by the company/others in the company?
selfmotivation	What are your personal goals and motivations?
bizmodel	What business model(s) are used by your company?
contribFLOSS	What contributions has the company made to the FLOSS community?
roleFLOSS	What do you feel is the role of FLOSS in society? What does it mean to you?
impactsoc	What impact has the company had on society?
different	What is a source of differentiation for your company?
defbizsuccess	What makes a business successful or a failure?
opportunity	What opportunities was the company founded to exploit?
revstreams	What sources of revenue does the company have?
strategy	What strategies will the company pursue in the future?
initbizmodel	What was the company’s initial business model?
client	Who are the clients? (location, industry, size, how they are selected) What sort of contracts do you have with them?

Appendix K Example of Fully-coded Theme

Interview subject	Interview date	Category	Group	Label	Meta Theme	Theme (code)	Theme (description)	Quotation	Summary	Page
Dave Grandinetti	2009-09-23	social entrepreneurship	philosophy	<i>roleFLOSS</i> : What do you feel is the role of FLOSS in society? What does it mean to you?	SOCIAL GOOD	equality	FLOSS promotes equality	“Ah, the role in society. Well, I think that it has some of the characteristics of the original internet. I mean it has the altruistic nature of sharing and collaboration, but I think that open source software has a great place in bringing the best of breed to everybody. It’s almost, oh I’ve thought about it the other day and what I was thinking about was, you know, John Rawls, ‘Veil of Ignorance’? So his theory about how you make a fair and just taxation system for government and the principle is, you need to imagine today that you didn’t know what you were going to be born as. So you could be a doctor, you could be homeless and you could be any of these things in between. Even right now, let’s say you don’t know what you are. So now design a tax system that you would feel comfortable with, not knowing what you are. So it’s kind of a leveler, you know it’s a way to make people look at things a little more fairly. And I think that open source has this great ability to kind of disperse information faster than even the internet itself. It’s a way to disperse best practices almost. I’m a big fan.”	bringing best of breed to everybody; disperse information/best practices faster than the internet; leveler; John Rawls & Veil of Ignorance	3-4
					DIRECT BENEFITS	learning	Using FLOSS is educational			
					SUPER- IORITY OF FLOSS	superior_tech	Technical superiority of FLOSS			

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