

# COMPUTER PROGRAMMERS AS VOLUNTEER WORKERS: THE CASE OF THE FREE AND OPEN SOURCE SOFTWARE MOVEMENT

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*The primary benefit of free and open source computer software to the community and not-for-profit sectors lies in the fact that it is almost always completely free of both charge and administrative encumbrance. A more detailed analysis of the context in which the software is created exposes an even greater relevance to the human resource and third sector management however – the individuals who create this software are volunteers. This paper introduces free and open source software, highlights the key technical and social factors that make it so interesting to the human resource management context, and applies the Levy (2006) framework to correlate the production of open source computer software with the Volunteering Australia definition of volunteering.*

## Introduction

Imagine, if you will, a world where all computer software is free. A world where you buy a computer but everything else that you need – the operating system, the word processor, the spreadsheet, the email tool, the presentation software, the PDF creator, the accounting program and the music player – costs you not one single cent. Imagine the freedom to give copies of this software to your friends and business partners, and imagine the freedom to change the software to suit your own specific needs. Imagine a world with no copy restrictions, no license fees, no annual software audits and no accusations of piracy.

Now stop imagining; there is no need. That world is here. All of the free software and all of the freedoms described exist now and are used daily by corporates, non profits and individuals all over the world. This software is called Open Source Software (OSS).

What relevance then does OSS hold for management scholars? This author has long observed that strong parallels exist between the fields of human resource management, volunteering and the work being done to create open source software and also, despite these parallels, that the fields are treated almost entirely in isolation in the scholarly literature. This paper links the literatures to demonstrate that the individuals who author OSS are volunteers according to the formal definition for volunteering put forth by the national peak body, Volunteering Australia. Where a colloquial definition might broadly include any unpaid work, the Volunteering Australia definition sets out specific parameters for the identification of work as volunteering and, by implication, the identification of those who carry out the work as volunteers. In formally classifying the authoring of OSS as volunteering, this paper contributes by broadening the scope of that which governments and organizations can acknowledge and support as volunteering, and brings the management of OSS volunteers into the scope of scholarly work in human resource management and volunteer management.

Designed for human resource management and third sector audiences, this paper begins by introducing OSS and highlighting the key technical and social factors that make it so interesting in this context. The phenomenon that is OSS, the value of OSS work and factors that motivate those who perform the work are discussed in turn and, because it is the author's experience that OSS is widely misunderstood, a descriptive and explanatory approach is

employed in those sections. In the initial part of this paper the term volunteering is invoked in its generic meaning, as others have done, to mean 'willing provision of unpaid labour' (Onyx & Leonard 2000, p.113). A more formalised definition for volunteering is invoked as the question of whether or not OSS work is formal volunteering is posed and as Marc Levy's (2006) table of volunteer principles is adapted to address the question by way of a point by point discussion of each of the principles and the way in they apply to OSS work. A concluding discussion proposes that there are factors that the formal definition for volunteering does not adequately encompass before asserting that OSS work is in fact a form of formal volunteering.

## Open Source Software

Computer programmers author new software by writing source code, a human-readable computer program that is later converted into a form that computers can run. Where the producers of commercial off-the-shelf (COTS) software – corporations such as Adobe, Microsoft and Symantec – regard their source code as a strictly secret corporate asset, open source software projects, as the name **Open** Source Software implies, make their source code freely available to all who wish to read, alter or distribute it.

To an absolute majority of individuals, the knowledge that OSS is high quality computer software that may be acquired, used and openly shared without financial cost will be entirely adequate. A deeper description of OSS is necessary to convey the unique features that make this particular type of software so interesting academically, and to reveal that characteristics of the work done to create OSS render it an important form of volunteering.

By way of definition it should be noted that 'Open Source Software' is not strictly an all-encompassing term. Philosophical differences between groups such as the Open Source Initiative and the Free Software Foundation have given rise to a number of terms including 'Free Software', 'Open Source Software' and 'Free / Libre Open Source Software' (FLOSS). The use of 'free' is a persistent source of confusion, and the groups that create the software go to great pains to assert the meaning as 'freedom' and not 'gratis' – the phrase 'free speech, not free beer' (Stallman 2001) is popular. Use of the term OSS in this paper is intended to encompass Free Software, OSS, FLOSS and other similar classes of computer software.

OSS is computer software that is distributed under licenses that grant the user certain freedoms, including the freedom to alter the software, and the freedom to openly distribute copies of the software to others at will (Open Source Initiative 2006). Whilst OSS licenses allow for the charging of a fee for distribution of the software, this rarely occurs in practice. OSS is not Freeware or Shareware, and it is not in the public domain – it is copyrighted, and strictly licensed (Perens 2001). Strict though they are, the OSS licenses focus heavily on ensuring that the freedoms they grant are maintained – a complete antithesis to the restrictions that COTS software licenses typically impose. Proponents of OSS refer to their licensing model as 'copyleft' to highlight the strong contraposition to typical copyrights: 'It's called copyleft because it's sort of like taking copyright and flipping it over' (Stallman 2001).

There are vast numbers of OSS projects (Crowston et al. 2004; Krishnamurthy 2002), and most of them are embedded within active communities (Lakhani & Wolf 2005). Large numbers of programmers work together to produce complex pieces of software that are often of very high quality (Challet & Du 2005; Ball 2003; Raymond 2001).

Individual and organisational motivations for using OSS are many. COTS software typically

uses secret formats to store and communicate documents and, once an organisation commits to using the software, they are effectively forced to continue to buy future versions and upgrades. In using OSS the threat of being locked-in to a particular commercial software vendor is negated and companies improve their negotiating position with those vendors (McFarlane 2005; Becker 2003). OSS is strongly preferred in many high security applications because the availability of the source code makes it possible for a thorough audit of the software to be made, something that is impossible with commercial closed-source software (Payne 2002).

Contrary to the popular belief that OSS is unsupported, organisations have a choice of vendors from whom to acquire paid technical services for OSS (Stallman 2001). The internationally known publisher O'Reilly and Associates derives much of its income from producing technical manuals for OSS, and many large IT corporates such as IBM and Novell offer enterprise level commercial support for OSS. Users of OSS have the choice of using free and ad-hoc support from the Internet or of paying for more formal arrangements. Where formal technical support arrangements for COTS software are typically limited to the software vendor themselves or third parties specifically licensed by the vendor, support for OSS is available on a free market basis and organisations that offer technical support services compete by offering customers a choice of services, prices and support arrangements.

Regardless of one's position on the appropriateness of making unpaid and unauthorised use of commercial computer software, there can be little doubt that it is becoming more difficult to do so. Commercial software producers are becoming more active in their aggression towards so-called 'pirates' (Guttman 2006; Lai 2006) and individuals who cannot afford to pay for computer software are placed in an increasingly difficult position. OSS has matured to the point where there are now a wide range of free alternatives to Microsoft Windows and Apple Mac OS X and it is no longer strictly necessary to buy expensive software as a precursor to using a computer. An individual can quite reasonably expect to take delivery of a cheap second-hand computer – perhaps one discarded by a large corporate, to request a copy of a Linux operating system be mailed to them at no charge (Canonical 2008), and to use their computer with a full range of business, entertainment and educational software at only the cost of acquiring the computer itself. The potential social benefits of this model will be immediately clear to those who work in the third sector. Many non profit organisations are eligible to receive copies of commercial software from programs such as the Microsoft Software Donation Program but those programs are not entirely cost free. Organisations must demonstrate their eligibility with applications and detailed reporting requirements that must be resubmitted every two years, limits are placed on the nature and volume of software grants, and processing fees apply to software orders (Donortec 2006). OSS licenses specifically exclude any restriction on the venue or nature of use (Open Source Initiative 2006) and so even organisations that are entitled to software grants may benefit from its use.

The key benefit of OSS to many small businesses and particularly individuals is often very simple: the price. Almost without exception, OSS can be acquired, used and passed around without fee and without restriction. OSS does not limit to benefiting individuals and organizations. As is the case with volunteering generally, the community as a whole derives value from OSS work.

### **The Value of OSS Work**

The economic contribution that the practice of volunteering makes to communities is well understood. Dr Duncan Ironmonger's (2000) study demonstrates the volume and value of

Australian volunteering in stark terms – 1,737 million hours worth \$28.1 billion in 1992 – increasing to 2,161 million hours and \$41.7 billion by 1997. The value of studies of this nature are clear: by demonstrating the impact of volunteering in strong and quantifiable terms, the practice of volunteering is granted credibility and legitimacy in the eyes of the community and of governments. That state governments in Victoria (Soupourmas & Ironmonger 2002), South Australia (Mayer 2003) and Queensland (Ironmonger 2006) have all commissioned reports on the value of volunteering in their communities confirms that governments now recognise the importance of the significant contributions that unpaid workers make.

The OSS movement is relatively understudied insofar as the contribution it makes to society is concerned. OSS does make a substantial economic input, but it is difficult to make country-specific claims regarding the economic or social contribution of OSS because the make-up of the projects, insofar as issues of language and communications permit, is inherently international (Dempsey et al. 2002; Ghosh 2006; Lakhani & von Hippel 2003). The Ghosh (2006) study finds that the cost for commercial software firms to reproduce the current base of good quality OSS software packages would be in the order of \$19.7 billion, and that this base of software continues to double every 18-24 months. Production of the OpenOffice.org suite – a free office productivity suite used in place of Microsoft Office by 91% of Brazilian and 73% of Indian government offices (Ghosh 2006) – is estimated to have consumed 79,000 person-months of effort worth \$792 million over the 11 year period that it has been in development (Ghosh 2006). It is important, however, to note that not all contributors to OSS are volunteers, some 40% of those who participate are remunerated in some way (Lakhani & Wolf 2005) but that the act of remunerating works is often in itself philanthropic.

OSS is attracting the attention of governments not for its economic value, but for its openness. Because OSS stores documents, spreadsheets, databases and other files in open, non-secret formats it is, as previously noted, impossible for the users of OSS to be 'locked in' to a particular software vendor. In the public context this factor enables governments to demonstrate effective use of funding by eschewing long term commitments to financially onerous computer software contracts. Interoperability between the systems used by governments, their constituents and other organisations is much easier to achieve, and governments are more readily able to meet their own obligations for openness and transparency (Simon 2005; Shapiro & Varian 2003). Many governments have already mandated adoption of OSS software in schools and municipal offices, Singapore offers tax breaks to companies that use Linux instead of Microsoft Windows, and the German government has arranged discounts for purchases of computers that have Linux pre-installed (Simon 2005).

Of course the value of volunteering extends well beyond the merely economic. As a key vehicle for the generation of social capital (Putnam 2000; Onyx & Bullen 2000), volunteering has far reaching societal implications. Crime rates are lower in communities with high levels of social capital (Putnam 1995) as are levels of anti-social behaviour generally (Onyx & Bullen 2000, citing Reno, Cialdini & Kallgren 1993). An implied theme of physical locality is present throughout most discussions of social capital. Putnam (2000) bemoaned the decline of social clubs and activities in local communities, Onyx and Bullen (2000) found that social capital manifests in different ways in rural and city based communities, and governments convene studies and work to improve social capital building activities within their own dominions. Social capital is mentioned with some regularity in the OSS literature, but almost universally in an unsupported manner. Many of the indicators for social capital are present – robust communities, trust, strong social norms of helping and reciprocity (Raymond 2001;

Bergquist & Ljungberg 2001) – but the question of whether social capital can be generated in virtual communities where the participants have never met remains very much open (Onyx 2007), though the levels of commitment and skill that the individual participants demonstrate bear no such uncertainty.

### **The Individuals who Author OSS**

Lakhani and Wolf's (2005) study of 684 contributors to 287 OSS projects revealed that a substantial proportion (58%) of the developers of OSS are experienced professional programmers and computer system administrators. Students (19.5%) and academic researchers (7%) also make up a significant proportion, at least half of all contributors have formal university-level training in IT or computer science, and many more are vocationally or commercially trained programmers (9%) (Lakhani & Wolf 2005). These findings are consistent with the knowledge that volunteers are often people who are highly educated, have higher salaries and have more prestigious jobs (Putnam 2000).

As previously noted, not all contributors to OSS projects are pure volunteers. Of the 684 respondents, most (87%) had not been directly compensated for their work but many made their contributions during the time they worked at their regular employment, in some cases with tacit or explicit consent from their employers (38%) and others without approval (17%). After allowing for those who received some form of payment for their work, 60% of participants in the larger OSS projects studied were estimated to be unpaid volunteers (Lakhani & Wolf 2005) though this estimate seems to ignore that the vast majority of OSS projects are quite tiny and operated entirely by unpaid workers. Many OSS projects are very small: a brief study of the 100 most active projects on Sourceforge – a clearing house for OSS projects – found that the largest number of programmers in the studied projects was 42, and that many projects had only one or two participants (Krishnamurthy 2002). Many of these OSS workers exhibit the highly committed nature that exists in many volunteers (Lyons & Hocking 2000), working for long periods of time at their craft (Krishnamurthy 2002) and often losing track of time while they are working (Lakhani & Wolf 2005).

In a parallel to the increasingly sophisticated Corporate Social Responsibility (CSR) programs that many corporates now conduct (cf. Cavallaro 2006), paying staff programmers to contribute to OSS projects is one way that organisations in the information technology industry 'give back' to the OSS community. Corporate contributions vary widely, from the tacitly approved contributions that Lakhani and Wolf identified (2005) to the employment of programmers with the specific goal of 'letting them loose' on the OSS project of their choice. Google, the well known internet search company, conducts their 'Summer of Code' event every year whereby they employ university students to work on OSS projects (Google Inc. 2007). In an approach that will come as a refreshing example to those who have supervised CSR volunteers in less than organised situations, Google's paid student volunteers are matched with organisations that have requested assistance, agreed to provide mentoring to the volunteer, and have offered work that the volunteer has identified as being interesting to him or her (Google Inc. 2007). Lisa Cavallaro's (Cavallaro 2006) finding that staff interests should be a top consideration is well supported by the Google example, though the question of whether these participants are in fact volunteers arises.

### **Motivations for Performing OSS Work**

One of the most addressed issues pertaining to OSS in the literature is that of motivation to contribute (Comino & Manenti 2005) and interesting contrasts arise from a comparison to the

volunteering literature. The application of a functional approach to the analysis of volunteer motivations, designed to bring rigour to an apparently atheoretical field (Clary et al. 1998), might equally well be made to OSS. Many of the 'motivation' studies for OSS reflect on a similar range of factors, but with no common basis for analysis.

In his seminal anthropological record of the OSS movement, Raymond states that 'every good work of software starts by scratching a developer's personal itch' (2001, p.23). Empirical evidence supports this claim, 58% of OSS developers write their software to meet their needs – some at work and some outside of their jobs (Lakhani & Wolf 2005). The largest single motivator for individuals who write OSS is intellectual stimulation (44.9%), and human capital (personal skill) development follows closely (41.8%) (Lakhani & Wolf 2005). Raymond acknowledges that programmers who submit their work to OSS projects benefit from a process of peer review of that work, and claims that their programming skills improve as a result (2001).

Strong social motivations, the product of a 'gift culture' (Bergquist & Ljungberg 2001; Rheingold 1994; Raymond 2001), also drive individuals to contribute – in accepting the gift of software code or technical assistance given by other members of the community, an obligation to 'give back' to the community at large is felt (Zeitlyn 2003) paralleling the reciprocity that is a feature of social capital development (Putnam 2000).

This paper does not attempt to enter the altruism / egoism debate (Clary & Snyder 1999) beyond acknowledging that it also occurs in the OSS literature. Organisations that contribute to OSS projects tend to do so for selfish reasons – organisations can often claim tax credit for their contributions (Ghosh 2006), and reputational, quality and financial gains (Bonaccorsi & Rossi 2004) are often also made - whereas individuals claim to be motivated by socially based and altruistic factors (Bonaccorsi & Rossi 2004). Computer programming is only one of a myriad of tasks that OSS volunteers carry out. Individuals provide technical assistance on a reciprocal basis in part out of cultural obligation (Lakhani & von Hippel 2003; Raymond 2001), but they gain a direct learning benefit in doing so (Lakhani & von Hippel 2003), so their motivation to help is not purely altruistic, but partly out of obligation and partly out of self-interest as well. 'Givers' in the gift economy rise in status in their community (Raymond 2001) and gain power (Bergquist & Ljungberg 2001) in part because the strict norm in the OSS movement of keeping the programmer's name associated with their contribution (Raymond 2001) means that a part of the giver remains with the gift (Zeitlyn 2003) and recognition of the gift persists. Speaking to Internet based communities generally, Rheingold acknowledges 'a marriage of altruism and self interest' (1994, p.58) whereby individuals receive a level of on line help from others that far outweighs the effort that they make in helping others themselves.

### **Volunteering Defined**

Volunteering Australia, the peak national body for the Australian voluntary sector, has prescribed a set of principles and a definition for the practice of volunteering (Cordingley 2000). The definition reads:

Formal volunteering is an activity which takes place through not for profit organisations or projects and is undertaken to be of benefit to the community and the volunteer, of the volunteer's own freewill and without coercion, for no financial payment, and in designated volunteer positions only' (Volunteering Australia 2005)

and is designed to provide a point of reference for scholars and practitioners.

The process by which OSS is developed has many features in common with the practice of volunteering. A large proportion of the individuals who work to create the software do so without remuneration, and in most cases where formal organisations are involved, they are not-for-profits.

Despite that most OSS is the product of teamwork, most of the teams never physically meet, and a substantial portion of the work on OSS is done by private individuals working alone (Lakhani & Wolf 2005; Raymond 2001). As has been noted, this factor holds relevance for discussions of social capital. It is also of interest in context of the relatively new phenomenon of virtual volunteering (see: Handy & Brudney 2007), albeit beyond the scope of this paper.

Having discussed the key factors that link OSS work with volunteering work, it is appropriate now to turn to a direct characterisation of OSS work as formal volunteering.

### **Is OSS Work Formal Volunteering?**

To address the question of whether contributions to OSS constitute formal volunteering, Marc Levy's (2006) formalisation into a list of specific principles from the more discursive Volunteering Australia (Cordingley 2000) principles is applied to OSS work as Levy did to government sponsored voluntary work and 'work for the dole' schemes. Three different modes of OSS work – individual contribution, workplace contribution, and sponsored contribution – are presented in Table 1 with an assessment of the extent to which each mode of OSS work complies with the definition of 'pure' volunteering and are then examined in greater detail in the subsequent discussion.

In this paper, **individual contribution** is defined as a situation where a person contributes of his own initiative without the involvement or urging of an organisation. **Workplace contribution** refers to the situation where an individual does his OSS work within the context of a paid workday. It is important to note that workplace contributions may be made without the employer's knowledge, with the employer's knowledge and tacit 'unofficial' approval, or as a formal part of the individual's paid employment. **Sponsored contributions** occur where a private individual's OSS work is sponsored by a third party but where the individual retains a great deal of choice regarding the nature and direction of their contribution. **Sponsorship** is used in this context to refer to situations where individuals are paid a sum of money beyond reimbursement of out of pocket expenses. The Google Summer of Code event previously discussed is an example of sponsored contribution where participants are paid USD\$3000.00 for the work they do over a three month period (Google Inc. 2007). Sponsored contributors are often tertiary students who do their semi-formalised OSS work during semester breaks from the educational institutions where they are often working towards a degree in a field related to their OSS work such as computer science or engineering.

Table 1: Extent to which different modes of contribution to OSS projects may meet voluntary principles

Voluntary Principles	'Pure' volunteering	Individual contribution	Workplace contribution	Sponsored contribution
1. Benefits the community	Yes	Yes	Yes	Yes
2. Benefits the volunteer	Yes	Yes	Yes	Yes
3. Does not replace paid workers nor threaten job security of paid workers	Yes	Debatable	Debatable	Debatable
4. Absence of benefits or Incentives	Yes	Yes	Debatable	No
5. Absence of penalties	Yes	Yes	Debatable	No
6. Presence of choice	Yes	Yes	Debatable	Yes
7. Through not for profit organisations	Yes	Debatable	Debatable	Debatable
8. Without obligation or compulsion	Yes	Yes	Debatable	No

Source: List of principles from Levy (2006)

## Discussion – Eight Voluntary Principles

Levy (2006) distils the Volunteering Australia definition to eight distinct principles. By this definition, work must benefit community, benefit the volunteer, not replace or threaten paid workers, not confer benefits or incentives, not hold penalties for non-participation, be a matter of free choice for the worker, be conducted through not-for-profit organizations and take place without obligation or compulsion in order to be recognised as formal volunteering. Each of these principles is examined in respect of OSS work forthwith.

### 1. *Benefits the Community*

Contribution to OSS projects brings clear benefits to the community at large. The mere availability of high quality software at no charge undeniably benefits many. Individuals and companies who previously could not or chose not to pay for the commercial software they needed to run on their computers now have a legitimate and legal alternative in the form of OSS. This solution is timely considering recent moves by commercial software vendors to make it more difficult to make unauthorised use of their software than ever. Non profit organisations that are not required to pay for the commercial software they use also benefit from OSS because they are not required to comply with onerous biannual application and reporting requirements imposed by commercial software vendors.

OSS adoption allows governments to save on software licence fees and, more importantly, enables them to meet their obligations with regard to openness and transparency. When a government releases documents and data, constituents must be able to read them. If, for example, a local government publishes transcripts of council meetings in Microsoft Word format, then constituents who wish to read the transcripts must purchase a copy of Microsoft



Word to do so. Transcripts published in OpenOffice.org Writer (an OSS equivalent for Microsoft Word) may be read by anyone with access to a computer without needing to pay for the software.

Where the question of community benefit becomes problematic is in respect of social capital. If the practice of volunteering is a primary generator of social capital, and individuals who contribute to OSS projects are volunteers, then it should follow that the practice of contributing to OSS generates social capital. Given the apparent theme of physical locality in the social capital literature, it seems reasonable to interpret that government support and promotion of volunteering and other similarly prosocial activities will be designed to deliver benefits to a specific (be it municipal, state or national) constituency. With the knowledge that contributors to OSS are spread across the globe, and that those who make use of the software are equally geographically diverse, then the question of where social capital is generated and who it benefits must arise. The question is relatively easily answered – the astute observer will quickly identify evidence of social capital amongst communities on the public Internet, but the tangibility and in particular the locality of the benefits may be difficult to demonstrate. If governments were to be asked to recognise contribution to OSS as a legitimate form of volunteering in their programs might they then ask, and quite reasonably so, that the benefits to their own constituency be demonstrated? Onyx notes the difficulties in speaking of 'community' in meaningful ways when we 'think global' (Dale et al. 2003) and points out that social capital is constantly generated wherever people are working together in suitably conducive circumstances and that social capital generated internationally is just as important as that generated locally (Onyx 2007).

## **2. *Benefits the Volunteer***

Skill development, reputational gains and career advancement are oft-cited drivers for those who contribute to OSS but while the goals are real, and my own direct experience and anecdotal observations support them, empirical evidence to confirm that participants actually realise these benefits is needed. Raymond's (2001) observations support the argument that individual's skills improve as their work is reviewed by their peers and that as the quality of their work improves so does their reputation amongst their peers. Respondents to the Lakhani and Wolf (2005) study cited enjoyment and intellectual stimulation as their primary motivators, and the finding that most programmers author OSS to address their own needs, both support the claim that volunteers benefit from their work. Notwithstanding that better empirical support of actual derived benefits will be helpful, it is appropriate to accept that the contributors do benefit from their activity with OSS. Future analysis of motivation in the OSS context will benefit from the application of a formalised method such as the functional approach applied to volunteering by Clary et al (1998) so that structured comparisons may be made between motivation in OSS and motivation in volunteering.

## **3. *Does not replace paid workers***

The question of displacement of paid workers is problematic in some sections of the OSS movement. In the absolute vast number of instances, projects are initiated by small numbers of unpaid workers and staffed by unpaid workers, there being no significant (if any) financial element to the work and no prospect of anyone being remunerated. Whilst formal organisation is rare, the requirement for designated volunteer positions (Cordingley 2000) is upheld by implication, there being no designated paid positions. Whilst this author is unaware of other than anecdotal evidence, clearly the same risks of abuse of voluntary labour as those that occur in the third sector from time to time are possible in the situation where a for-profit

organisation accepts contributions to their OSS from external parties. Access to unaffordably large numbers of skilled contributors is an acknowledged benefit to for-profit organizations that release software as OSS (von Hippel 2005) and so the threat of displacement to paid staff is clear.

#### **4. *Absence of benefits or incentives***

The Volunteering Australia definition puts it that volunteer work is unpaid (Cordingley 2000). Clearly, in the contexts where the status of contributors as unpaid workers is unmitigated, their volunteer status is supported by this principle. Where individuals do their work from their paid workplace and where they are sponsored, the position becomes more clouded. As previously noted, Onyx and Leonard put it that 'volunteering requires, as an essential prerequisite, the willing provision of unpaid labour' (2000, p.117). On this position, those who are paid are simply not volunteers. The status of sponsored contributions is troubling however, in a similar way to the paradox presented below of 'volunteers' who work for OSS projects through for-profit organisations. Their contribution ultimately benefits the community and is delivered to the community, but their participation is sponsored financially and so they may be classed as paid workers.

#### **5. *Absence of penalties***

Formal penalties, such as the withholding of benefits or allowances, cannot accompany volunteering. This is a problem in context of voluntary work initiative and work for the dole schemes (Levy 2006). As is the case with the issues of choice and remuneration, the presence of penalties is very context dependant where the work is done from the individual's paid workplace. If the employee works without formal sanction of their employer, then penalties for non-contribution are unlikely to be present. In the case of paid and sanctioned work the question is moot by virtue of contributor's status as a formal paid employee. The Google Summer of Code event is a special case of sponsored contribution: participants are required to meet certain levels of performance in order to receive their sponsorship payments (Google Inc. 2007).

#### **6. *Presence of choice***

There is little scope for argument that a contributor acting in his capacity as an individual does so other than of his own free will. Similarly, the individuals identified by Lakhani and Wolf (2005) who contribute unofficially from their paid workplaces – whether their managers are unaware of the activity or have granted tacit approval – are clearly choosing to contribute and choosing the focus of their contribution. Individuals who participate in the Google Summer of Code event choose which project to contribute to, and are encouraged to submit their own proposals where one that meets their interests is not already presented as an option (Google Inc. 2007).

The only context where choice is not a component is the situation where individuals do their OSS work as a part of their paid employment, and in those instances the payment negates the voluntary status of the work. A small number of cases exist where organisations employ an individual and then in effect set them free to work on whatever OSS project takes their fancy (Spooner & Shankland 2003; Berniker 2003).

## **7. *Through not for profit organisations***

The principle requiring volunteering to take place through non-profit organisations is problematic in the OSS context across all modes of contribution. Many for-profit corporations release their software products as OSS, choosing to generate profit by means other than directly selling the software, and the question of whether an individual who otherwise meets all of the voluntary principles contributes to an OSS project run by a for-profit organisation is in fact a volunteer, at all. It is argued that the voluntary principles fail the volunteer in this instance, because regardless of the motives of, and the possibility of profit for, the mediator the net result is that the voluntary contribution passes back to the community as OSS.

## **8. *Without obligation or compulsion***

In the same way as has been argued in respect of penalties, the workplace contribution and sponsored contribution contexts are special cases where some level of obligation or compulsion is present. Individuals who contribute of their own volition and in other than these two modes satisfy this requirement.

## **Conclusion**

Those who use the term 'volunteer' to describe the individuals that contribute to OSS projects are clearly correct to do so. Willing provision of unpaid labour is prevalent in the OSS movement, and a substantial proportion of those who contribute fit the Volunteering Australia definition for formal volunteering. The definition is problematic insofar as it applies to volunteers who contribute their work back to the OSS community via a for-profit mediator and it is argued that OSS work is a case where the Volunteering Australia definition falls down to some extent. A revision of the definition is required to properly acknowledge the work that OSS volunteers do in their unusual and largely virtual context. Whilst this paper demonstrates that there are clear commonalities between the literatures, there is significant scope for additional scholarly work in strengthening these linkages. Motivation to contribute, despite being one of the most investigated facets of OSS, will also benefit from further studies constructed to allow empirical comparison with the motivation in volunteering literature. Additionally, further research is required to address the question of whether social capital can be generated in communities where the participants never meet face to face applies particularly to OSS work. Despite that some work is required to facilitate formal examination of the fields in concert, it is clear that the fields of OSS, human resource management and volunteering have much to gain from each other.

## **Glossary**

COTS	Commercial, Off-The-Shelf Software
FLOSS	Free / Libre Open Source Software. A term designed to encompass 'Free Software' and OSS, and to highlight the 'freedom' granted by the software licences
FSF	Free Software Foundation
OpenOffice.org	An office productivity package that includes word processor, spreadsheet, presentation package and database that is a very capable substitute for Microsoft Office. OpenOffice.org is OSS, and free of charge.

OSI	Open Source Initiative, an organisation that administers the 'Open Source' trademark and grants the right to use the mark to bona fide OSS creators
OSS	Open Source Software
Linux	A complete windowing operating system for personal computers that may be used, with all the freedoms of OSS, in place of Microsoft Windows or Apple Mac OS. Well-known examples of complete ready-to-run systems include Ubuntu Linux, Red Hat Linux, Suse Linux and gOS Linux.

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