The Academic Open Source Software Developer: Portrait of a Subjectivity in the Network University

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Abstract

Academic open source software projects represent one way by which universities are becoming active members of cyberspace. Framed by theories derived from the field of higher education such as "the condition of publicity" (McLennan, Osborne and Vaux) and the "Glonacal agency heuristic" (Marginson and Rhoades), this essay explores open source software development within academic institutions. Based on semi-structured interviews with a small group of software developers from an open source software project called the Online Journals System (OJS), this essay proposes that a subjectivity--the 'academic open source software developer'--is emerging within academic environments. This subjectivity navigates the boundaries of multiple subjectivities, some of which are oriented towards resistance, and some of which further reproduction within the arena of higher education. It demonstrates that the work of universities takes place not only via the traditional work of researchers and academics, but also by this new set of professionals who are neither students, nor professors nor researchers. It represents one way in which the Internet is affecting the structure of universities.

Keywords: University, post-secondary institutions, academic institutions, software developers, cyberspace, internet, networks, network university, situational analysis, open source software, Open Journal System.

Introduction

The question of how to approach studying contemporary universities in relation to cyberspace is challenging not only because universities more aptly resemble "multi-versities" (Kerr) and as such are institutions that are at once moving in various sometimes contradictory directions, but also because cyberspace is itself incredibly dynamic and expansive, and filled with similar paradoxical processes and artefacts making it difficult to theorize and analyze (Saco; Escobar et al.; Bell). A suitable methodology consequently seems elusive. Studying universities in cyberspace, despite the challenges, is an incredibly worthy and valuable goal, particularly as

the space of cyberspace becomes increasingly inhabited by all spheres of academic life, from university web sites, to professorial research blogs, to student web spaces (of all forms), to institutional repositories where academic research is accessible to the world, and more.

This essay is part of a qualitative study that looks at the development of an open source software application. Open source software is free for anyone to download off the Internet, use, re-use, and modify, and carries an open source software license, such as the General Public License (GPL), that guarantees it remains free. The Open Source Initiative (OSI), founded in part by the software developer and open source software theorist Eric Raymond, provides examples and samples on their web site www.osi.org of a variety of different open source licenses that developers can apply to their software application that are completely free. While not quite a cohesive social movement, much has been written about this software development process and the many communities and projects that have developed around the phenomenon (Ghosh et al.; Lerner and Tirole; S. Weber; Bradley; Raymond; Ockman, Stone and DiBona; Castells; Benkler; Langman). Raymond's iconic essay entitled the "Cathedral and the Bazaar" describes how the open source software development method is superior to proprietary software developed because of how it encourages and sustains peer review. Richard Stallman, also a software developer and founder of the Free Software Foundation (www.fsf.org), argues that free software is a human right, and is comparable to free speech. Raymond and Stallman, former colleagues and friends, both stand behind the phenomenon of free software in contrast to closed and proprietary software, but for different reasons. Raymond holds a more pragmatic and business-friendly position arguing that open source software is not a moral issue, but is rather about producing the best software. As Bradley explains, "Stallman tends to be more concerned with achieving the utopian goal of distributing software unfettered by proprietary licensing regimes. Raymond, on

the other hand, tends to view Stallman's utopianism as laudable but ultimately counterproductive when it comes to actually deploying FLOSS in existing corporately dominated software markets". Despite their differences, Raymond and Stallman both stand behind what is today an essential 'socio-digital' phenomenon. Open source software applications are foundational to the development of the internet, and many have been developed in academic institutions (Moody; Kahin and Foray). Thus they serve as one way by which to study the intersection of universities and the Internet.

The Open Journal System (OJS) is an open source software system developed by a professor at the University of British Columbia, and is now housed at the Simon Fraser University (pkp.sfu.ca/ojs). It serves as the example within this research project of one way in which universities are present in cyberspace and are involved in digitally networked and mediated projects. The study, based on semi-structured interviews with OJS software developers and email interviews with OJS users, employed Clarke's methodology of "situational analysis" (Clarke) in which I theorize an organizational form–the 'cooperative digital research project'--that is emerging in contemporary universities and post-secondary institutions as a result of their Internet activities. I view this form as a dynamic ideal-type based on the model building process of the German sociologist Max Weber (Burger; M. Weber).

The argument I propose is as follows: as many media and social theorists have shown, new technologies introduce re-formulate and re-inscribe discourses, practices and subjectivities into existing social situations (Haraway; Mansfield; Foucault). Clarke, herself a sociologist who analyzes situations in which medical technologies are involved, posits that the task of a social researcher is to:

> [C]onceptually replace modernist uni-dimensional normal curves with postmodern multidimensional mappings in order to represent lived situations and the variety of positionalities and human and non-human activities and discourses within them. If we do not pursue this in our research we merely continue performing recursive classifications that ignore the empirical world (25).

One possible result of the involvement of universities in cyberspace, which is carried out in part via the creation of open source software applications, is the production of a subjectivity based on the presence, language and actions of the open source software developers involved in the development of the OJS software. As cooperative digital research projects proliferate, the subjectivity described in this essay also proliferates. Up until this point, it has been largely unrecognized and, by extension, untheorized from the perspective of higher education.

In the methodology of situational analysis, Clarke, a former grounded theorist, asks that researchers study "the conditional elements of a situation" which "need to be specified in the analysis of the situation itself as they are constitutive of it, not merely surrounding or framing it (71)." To this end, Clarke asks that we, as researchers map out the social worlds and positions of all of the elements that make up a situation, including "how particular discourses are taken into account in changing identities and subjectivities" (155) and study the intersection of individuals, institutions, discourse and technologies to understand the process of subject making (156). The situation that I examined was comprised of multiple collective/institutional elements and actors: higher education institutions, Simon Fraser University specifically; the OJS developers and OJS users; political and economic elements: the marketization of the university and the open culture movement occurring online, to name a few. I am using the concept of subjectivity, as Clarke would, to theorize the OJS developers as a way of showing that their positions, habits, identities

and language are socially produced by all of the different elements and social structures in the situation. Thus subjectivity denotes a level of diminished autonomy in the sense that it is produced by larger social structures; this does not mean, of course, that the OJS developers were not free agents with human wills. It means instead that they operate, as we all do, within specific "conditions of possibility" within which they participate. The subjectivity, furthermore, is comprised itself of multiple subjectivities some of which stand in contradiction to one another, simultaneously reproducing and resisting the social elements of their situation. Last of all, the subjectivity is fluid and dynamic, changing and shifting along with all of the elements of the situation.

Based on limited data from a small empirical study of one open source software project I theorize that this subjectivity, as exemplified by the software developers who worked on the OJS, is constituted by: men, who prefer flexible and contractual employment to full time with benefits employment; who believe in the larger ethic associated with open source and free software, namely that information should be free which is itself a discourse; who display a sense of loyalty to the 'project' (i.e. the software application) as opposed to the university, for whom the university operates as a set of ideals as opposed to an actual place. They are former university students with a love of coding and see themselves as "hackers" (Levy), who believe their work contributes to the task of global development through free information leading in turn to what they view as equity and social justice. They see themselves as cyber-activists, and travel as part of their work, participating in conferences and workshops about their software.

This essay begins with a brief review of the literature of contemporary higher education, thus situating this study within the framework of higher education studies. It continues with a description of some academic open source software projects followed by a description of the

OJS, an example of an open source software application. I then describe and explore the subjectivity posited here, the academic open source software developer, based on semi-structured interviews with OJS developers, and end with an assessment of its importance.

Beyond the 'GloNaCal' to a 'condition of publicity'

The theoretical roots of this study of open source software developed in academic institutions originate in an essay written by the higher education theorists Simon Marginson and Gary Rhoades entitled "Beyond National States and Markets: A GloNacal Agency Heuristic". In this essay, the scholars underscore the importance, since the heightening of global conditions within the sector of higher education, of moving beyond traditional analytical categories (i.e. state vs. market) to understand current trends in higher education. Thus they propose their GloNaCal Agency heuristic, which is based on analyzing global (Glo), national (Na), and local (cal) factors in higher education. The 'agency' aspect of the heuristic makes space for individuals who participate in higher education, thereby giving their choices some amount of importance without being subsumed by structural forces. As the authors state:

> The aim of our heuristic is to foster exploration and analysis of types and patterns of influence and activity, to reconceptualise social relations and actions globally, nationally and locally. The heuristic encourages a focus on specific organizations and collective action rather than overgeneralized conceptions of polities and states, economics and markets, or higher education systems and institutions (290).

Rhoades and Marginson's search for new ways to understand and research contemporary higher education provided justification for a study of open source software which embodies the elements set out in the GloNaCal Agency heuristic.

Another source of justification for a study of open source software projects developed in universities is seen in McLennan *et. al's* theory of the "condition of publicity (McLennan, Osborne and Vaux)". Drawing from Lyotard's theory of performativity, the authors examine the

London School of Economics (LSE) and theorize the institute's research and communications strategies over the past decades. They argue that:

> a 'condition of publicity' is now central to the maintenance of academic eminence. This refers to the imperative to be, and be seen to be, not only 'engaging with the wider world' but also producing the sort of 'informational ideas' that appeal to policymakers and that take their place in the contemporary mediascape. ... we need to think carefully about *the type of ideas*, and corresponding *mode of intellectual work* that is being generated in the 'condition of publicity'(245).

The analysis of the LSE serves as precedence for research into academic open source software projects where the field is only beginning to recognize the importance of media studies oriented methods and sources of research. Taken together, the "GloNaCal Agency heuristic" and the "condition of publicity" represent a step in the direction of theorizing higher education using new approaches and methods. They work to legitimize research into open source software.

Over the past decade, some theorists of higher education have adopted a critical attitude towards the trajectory on which universities around the world are travelling. The most common characteristic of this trajectory is an increase in universities' "capitalistic" behaviour (Slaughter and Rhoades). Some derivatives of this behaviour, charted by Rhoades and Slaughter in what has become, arguably, one of the most seminal works in the field of contemporary education, include "entrepreneurialism" in which universities seek out new ways of raising capital, such as through technology transfer. Michael Peters, an education theorist who has written about postmodern influences in the arena of higher education, argues in numerous essays that academic capitalism, neo-liberalism, managerialism and discourses associated with digitization, such as knowledge economies are becoming predominant elements within universities (Olssen and Peters; Peters). In an essay devoted to a discussion about the open movement in higher education he argues that that open source software and open access to academic information are ways by which market

forces can be counteracted. They are therefore important movements that need to be not only endorsed but also researched further (Peters 229-237). Peters' argument is the backdrop for my research into open source software development within the Canadian public university.

Academic open source software projects

Having originated within the walls of the "ivory tower" (Nissenbaum and Price), many universities are now developing their own open source software projects. Some well known examples of these projects include: the MIT's D-space (www.dspace.org/), which is a software application that facilitates the creation of institutional repositories, or large data bases used by academic institutions to store research and pre-prints; the content management system Moodle (moodle.org), which, incidentally, also began as part of a graduate thesis of a doctoral student at Curtin University of Technology in Australia, and is used as a learning management system by thousands of universities around the world; the Sakai collaboration and learning environment (CLE), which involves 150 member institutions in its development (sakaiproject.org); and the University of Toronto's e-Presence software (epresence.tv/), a web casting application that also archives the video (which may also be used with Moodle). GRASS, which is a geographic information system GRASS (grass.itc.it/), is an open source application that began in 1982 as a collaboration between private companies, federal agencies (including the military), and universities to capture geographic information. Not only is the application itself shared and continuously developed within these various institutional settings, but so is its content.

Academic open source software projects are developed in a number of different scenarios. The above mentioned are larger scale-able systems that are relevant to most institutions--all universities and colleges, as an example, provide some sort of web based materials in their courses, and many universities are looking to develop institutional repositories.

Other applications are smaller scale, and might have been developed to facilitate an academic's research, and released for free so that it might help other researchers. Similarly, a software developer, employed by a university to develop an application to manage some university related information and data, might have released the application open source to enable someone else to take the reigns of the project, and redevelop it. In other words, many academic open source software projects are not developed and marketed centrally, particularly if they serve a niche purpose. Indeed, even those that are larger and well-known began as modest, small scale, experimental projects. The web site Sourceforge.com is a searchable database of open source software projects that serves as a useful resource for software developers. Many of the projects listed in Sourceforge were created by university employed developers with the intention of serving the academic community (www.sourceforge.com).

An oral history of The PKP/ OJS

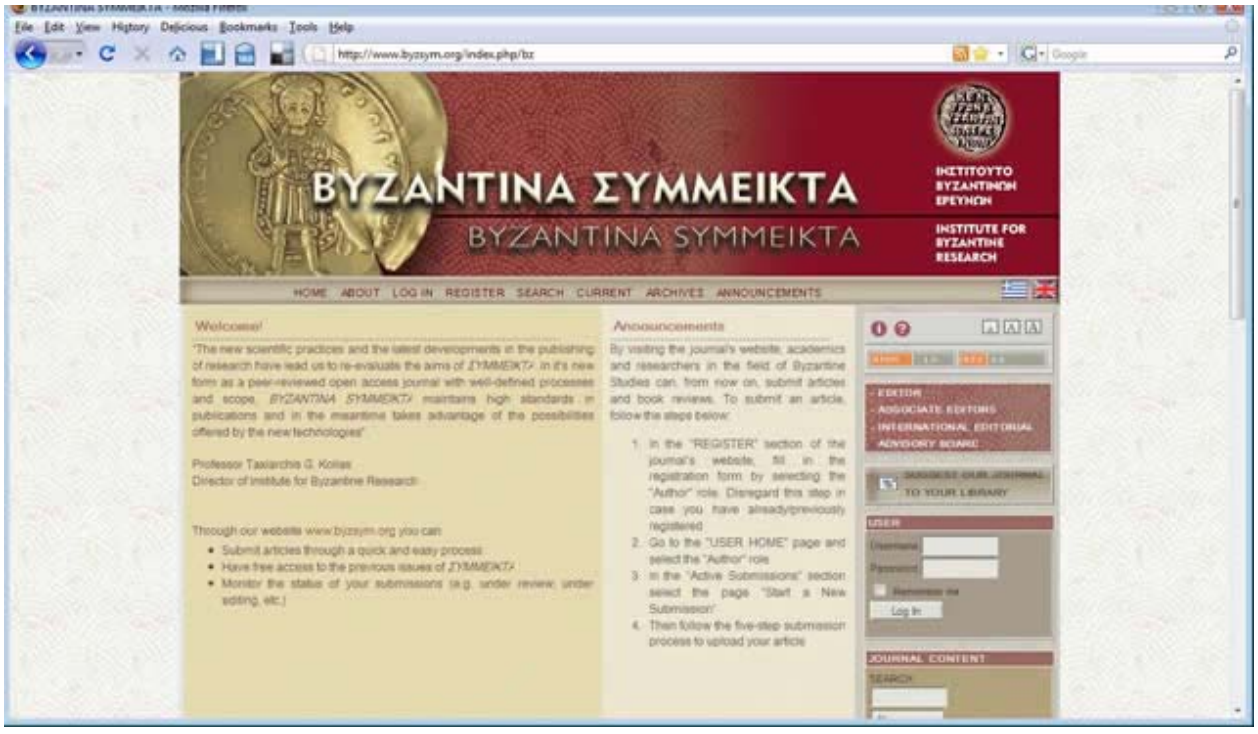
The Open Journal System (OJS) is an open source software application that facilitates the creation of open access peer reviewed journals. The project began in 1998 as a research initiative by Dr. John Willinsky, a professor of education at the University of British Columbia, and was initially an open access clearinghouse for educational information. In 2000 the direction of the project transformed from that of a clearinghouse/web site, to a content management system geared towards publishing academic peer reviewed journals. This direction aimed to empower researchers to publish their own journals as a way to distribute their research while preserving the integrity of the academic tradition of peer review. As the development of the OJS progressed, Willinsky, informed by his student developers, adopted the General Public License (GPL), the standard open source intellectual property license, for the system. As an open source software system, the OJS was free for anyone to download, use and redevelop. As an open source system

that facilitated open access publications, the OJS soon became a potent tool for open access advocacy, and Willinsky secured awards and grants to help fund its development. In 2005, Willinsky, still a professor at the UBC, partnered with the Simon Fraser University library and the Canadian Centre for Studies in Publishing to continue the development of the software, as well as to offer services to help academics all around the world implement the software within their own institutions.

The OJS is now one part of a the larger Public Knowledge Project (PKP), which is comprised of several open source software applications that all relate to open publishing, including an application that manages information for academic conferences called the Open Conference System (OCS), and several indexing and meta-data applications that enable OJS journals to integrate within larger databases so that articles and essays are searchable. An open book publishing application is currently under development, and several research projects about the impact of the open access movement and the OJS software are underway under the umbrella of the PKP. In 2007 the OJS was being used to produce one thousand journals. According to statistics gathered by researchers in 2009 from the PKP, the OJS is now used by four thousand journal producers ("A Sample of Journals Using Open Journal Systems," 2009). The OJS has also been adopted by academic institutions all over the world, with a significant presence in South America and a relatively significant presence in Africa (pkp.sfu.ca/ojs-geog). The system has been translated into over 30 languages with many of these translations donated by users. Following the release of version 2.0 of the system, in which its design was overhauled, the SFU library/PKP project held a conference at which users were invited to present their journals, describe their experiences of using the system, learn more about using the system to its fullest capacity, and learn how to contribute code and modifications. OJS users from all over the world

were in attendance. A second PKP conference was held in 2009. In the spirit of participation and access, PKP conference organizers, presenters and attendees streamed all of the presentations on the PKP web site, while also blogging their ideas and opinions about the conference (http://pkp.sfu.ca/node/2096). Willinsky's keynote address about intellectual property in the context of education, is also located on the PKP conference web site (housed in the Open Conference System software application): http://pkp.sfu.ca/ocs/pkp/index.php/pkp2009/pkp2009/paper/view/195.

Screenshot of a Greek OJS journal:



The OJS software was criticized by users for being overly prescriptive in terms of its aesthetics and design, as well as in relation to the design of the back end of the system in which publishers and editors have to push papers through a traditional, some might say anachronistic, publishing process. Willinsky has admitted to being conflicted over this: on the one hand, he would like to provide a software system that is flexible and current, but on the other hand, he and his team believe in preserving, or at least offering, the traditional scholarly publishing process from peer review to layout editing and galleys.

OJS software developers and designers have responded to critiques by increasing the flexibility of the software system allowing users to turn on and off different functions. They have also, according to users, provided timely and responsive service on the forums, and recently updated the organization of user forums according to geographic and regional context. The PKP/OJS web site contains a number of comprehensive instructional materials and software demonstrations, and the SFU library offers OJS web hosting. And the developers have created reliable middleware applications so that their systems can work with a variety of databases. Overall, the OJS software project seems to exemplify the best of all possible open source software projects in terms of it being both embodied (i.e. two PKP conferences which often subsidize and sponsor delegates who would otherwise be unable to attend) and distributed. It is well designed and flexible, but more important to its user community, it offers responsive service and opportunities for user involvement. I see it functioning as an active knowledge node.

One possible critique of the PKP project has less to do with the PKP project itself, and more to do with systemic and structural questions. That is, does offering these tools compel academics to become involved in internet activities, so that these activities become an inexorable part of their work responsibilities? Does it push them to become involved in a knowledge

network that actually works to sustain traditional forms of exclusion, as opposed to inclusion? Does it provide more digital space to some universities and institutions and not others?

Description of OJS developers

The PKP/OJS software project which is housed at Simon Fraser University, is comprised of software developers, librarians and information specialists, students, and researchers. Currently, there are seven developers working on the project, and two librarians who also served as technical advisors/ developers. At the time when this research was conducted in July, 2007, there were three main OJS developers, and two librarian/technical advisors, all of whom participated in this research project. In order to maintain anonymity, the research participants were given code names beginning with the letters CMP which stands for core member of project. What follows is a more detailed description with demographic and educational information, of the participants.

All five of the CMPs described in this research study were males, with university educations, between the ages of 25 and 35. Two out of the five of these respondents held a background in library and information studies--one was a librarian at the Vancouver Public Library prior to working for the SFU, and one of the developers was pursuing a master's degree in library and information studies at the University of Toronto while also working for the PKP/OJS. This respondent already held a degree in computer science from the University of Waterloo. The remaining two developers possessed distinct academic backgrounds. The lead developer earned a computer science degree from the SFU and had done some programming work on a contract basis for the university, and the last developer earned a computer science bachelor's from the University of Waterloo, and geography master's from a university in Peru.

Preference for flexible employment

The OJS developers expressed a preference for contractual and part time employment, and this preference seemed to fall in line with their general outlook on work and life. It also impacted on the way they identified with the university context. For the lead developer, being in control of his schedule and having the ability to travel was paramount because he belonged to a music band that often travelled and toured. He would not let his work with PKP/OJS get in the way of his "rock star night job" (CMP1). The ability to control their own schedules and working conditions was important to the core members. As one developer explained in a conversation about the lead developer:

> [T]hat's the flexibility that I think largely he is responsible for introducing because he was a pretty key individual. And he was very clear with SFU that he was more than happy to continue working there but he wasn't coming into the office. He had the influence to be able to pull that off, and the dedication and the work ethic to demonstrate that it works. He opened the door for me so that when I said to SFU sorry I was quitting they said, well, wait a minute, this is working with [CMP1], may be it can work with you, if you are interested. And I said, well, yes! And it's worked really well.

Flexibility and independence in relation to their 'day job' work was an important working condition. Another developer describes how the notion of mobility was natural and inherent to the PKP/OJS development work. All he needed was an Internet connection and his laptop. As he explains:

> I mean, [CMP6] and [CMP1] and myself, the three core OJS developers, I mean, our offices are on our backs. We like to be able to travel around and work from the beach sometime, and you know, who wouldn't want to? What's the difference between sitting on the beach and sipping Pina Coladas and sitting on the beach and developing code [CMP5]?

The job security that is often associated with contractual work within the university environment was not a concern for the developers, even for the one developer who had a family to support. As he states:

> I understand the security benefits. But I quit being full time in 1996 at the Vancouver Public Library, and haven't been full time anywhere since. I guess, and I always feel funny saying this, but I feel self confident without the security. I have been able to give up what I see as the straight jacket of full time employment, and do things a little bit more my own way [CMP4].

Thus full time employment for the developers signified a daily desk-oriented scenario that was unpalatable to the freedom that open source software development offered to them. When they were asked why they could not be full time and flexible as well, they made it clear that this had to do with their image of what it meant to work for a university. As one developer explained:

> That's university politics and bureaucracy and the fact that if you let one regular employee work from home then why can't you let all other employees work from home? I mean, frankly, some employees aren't suited… within a unionized environment how do you say 'you are' and 'you aren't'? I mean, SFU realizes that the only way to make that work is if you are a full employee you sit at your desk and work. And if you want to work from home or work from Prague then it's by contract [CMP4].

Contemporary universities have come under fire for refusing to offer their employees stable full time work with benefits which seems more preferable than contract work (Rhoades *Managed Professionals: Unionized Faculty and Restructuring of Academic Labour;* Rhoades "Re-Organizing the Faculty Workforce for Flexibility"). Within the arena of university employment, this issue is played out in discussions about tenure, which, while once standard for professors, is becoming increasingly rare. As a result, campuses are being populated by the "sweated labour" of sessional instructors (Rajagopal). Of course the tenure debate has very different characteristics than this situation, because of how tenure issues are connected to larger academic issues such as academic freedom. This is what contributes to the idea that the developers form a different--whether new or *re*-formulated--subjectivity than existing social groups working within the university environment. The developers that worked on this project all agreed that the flexibility of working in this more 'project oriented fashion' suited their lifestyle as well as the demands of the job. Indeed, this was one of the reasons why they preferred open source programming as

opposed to working in a commercial environment, where, they felt they would be "tied to a desk"[1]. This characteristic recalls an interesting discussion by David Bell describing "work stories" and "patterns of work" in introducing readers to the study of cyberculture (19). Bell discusses the work of theorists such as Saskia Sassen who looks at the intersection of labour and capital in the development of cyberspace, and argues that new forms of unpaid digital labour are reformulating traditional forms of exploitation, and Tiziana Terranova who analyzes the effects of "high tech gift cultures"(Bell 20). The developers' attitude, as a social group, is an interesting contrast to the attitudes of aspiring academics for which freedom is signified by security and as such seem to embody Bell's notion of work stories.

While they preferred working for the university, they were not necessarily enthusiastic about working *at* the university. They preferred to work either from home, or more accurately, whatever location where they happened to be. They viewed the university as a superior alternative to a commercial environment, but they also saw their involvement in the PKP/OJS project as a different form of work than a traditional form of university employment. As CMP 4 states:

> [w]ithin the university environment I think there can be some very strong Monday to Friday, 9-5 perspectives, and as laudable as that is as a lifestyle choice, the culture that we have developed is a little more flexible and I think we get benefits from it. But at the same time I think there is an expectation that if an emergency happens on Saturday afternoon, you deal with it. And I think that's reasonable.

That the core PKP/OJS team members worked on a contractual basis did not signify that they were less committed to their work. If anything, as they saw it, the hours that the developers spent on the project, while more irregular, often outnumbered a typical forty hour work week. Many of the code contributions and requests for help with the software were coming in internationally at different times of the day. As such, the developers explained that they often responded to

questions and requests on user forums at all hours of the day and night. Throughout conversations, it became clear that the developers identified the PKP/OJS project as their employer, rather than with the SFU library, even though they all understood that the SFU was the institution behind the project. Ultimately they held positive attitudes towards their flexible labour positions, possibly because this falls in line with the common--some might say cultivated--depictions of what it means to be an open source software developer, social media activist and member of the "creative class" (Florida). The developers did not see their jobs as precarious or contractual (even though they were), and did not worry about the future of the PKP project.

While the developers were employed by the SFU library, most of their work was accomplished online beyond the walls of the library and the boundaries of the SFU campus. Up until the PKP conference in the summer of 2007, two of the main developers had not met the lead developer. One developer resided in Toronto, Ontario, full time, while another split his time between Ottawa, Canada and Buenos Aires, Argentina. The lead developer in turn worked either from his home in North Vancouver, British Columbia, or while touring with his band across Europe. Indeed, CMP4 described how one particular module of the second version of the OJS had been fully developed while CMP1's band was on tour in Prague. As a result, computer-mediated communication was the main mode of communication in the development of the OJS. As CMP5 describes:

> [CMP1] and I email each other daily, and [CMP6] and I email each other daily. We are pretty much in constant contact. But I have only ever actually met him [referring to CMP1] twice ... and our relationship was completely mediated through email and our relationship through PKP.

He further describes how CMP6 was excited to meet the PKP/OJS team in person at the conference but that he required CMP5 to point people out to him- this despite the fact that they had all communicated via email on the software prior to the conference. Despite the distance, the

developers agreed that they felt a common bond, and furthermore, they respected one another. As CMP5 states referring to his meeting CMP1 for the first time:

> I mean I could show up and immediately know … I had this professional relationship with him even though I didn't even know what he looked like. And there are other members of the developer team who have that same sort of relationship. I know their name, they are very familiar to me, but I have never met them. There's an element in a lot of ways of this distanced relationship, but at the same time there is also that very close kinship that you can have between developers on the same project.

The development work for the PKP/OJS was organized in line with the popular descriptions of how open source software projects, as they have been described in the literature, tend to function: in a distributed fashion. Yet while they were scattered through space, they were not distributed across context since they were all employed by the PKP/OJS--as opposed to being volunteers, a status that is common in descriptions of open source software programming. The key point here is how the university context operated as a set of ideals and principles in which its status as a non-commercial and non-corporate organization was of great importance. That is, the developers, who rejected working in a corporate environment preferred working for a university because of its larger social role. This is important in light of contemporary critiques regarding the corporatization of the university wherein the contemporary university is closely linked with industry, for example, producing knowledge for commodification (Aronowitz). In contrast, the OJS developers hung on to the idealized version of the non-corporatized university. It underscores the idea that for the developers the university was less a 'bricks and mortar' or physical context, but rather a *set of ideals.* It also points to a disjuncture between the reality of the contemporary university and the way the university is positioned in the popular imagination.

Origins of developer involvement in the PKP/OJS

OJS developers became involved in the project in an impromptu or casual manner. All of the core developers' involvement in the software development grew and evolved over time, and

their roles expanded as the project grew larger and more globalized. Most of the members of the core PKP/OJS team became involved in the project through communications with the project founder. The lead developer had been a student at the SFU, and had done some contractual software development work for one of the university's professors. In so doing, he met another core developer who had been doing some work re-developing the OJS meta-data tool. He then contacted Willinsky to pick up some work on the project and eventually took over more of the software development. He ultimately grew into his job as the lead software developer, and as this occurred he adopted the mentality associated with open source software development and open access activism.

The last two core developers of the project became PKP/OJS team members by getting involved in the development of the software as users. Both of them, friends originally from the university of Waterloo, had customized and redeveloped the software in OJS' early days for a medical journal that they were working for (at different periods of time) and had communicated with the first lead developer who was a student at the UBC (he had left the project prior to the SFU partnership, and was unavailable to interview). Their involvement as PKP team members was also casual. As CMP5 describes:

> They had the support forum, and that was how I met [the former lead developer], and John Willinsky, and I was involved then, and I put a lot of effort into being more and more involved and try to find ways to collaborate with them, and officially started with them, I guess last summer. I sort of elbowed my way in.

CMP6 explains how he became part of the team, as well as how his role as a PKP consultant in Latin America expanded and evolved:

> I had done a lot of development for OJS within the context of [a medical journal] and it was all of those developments that I had done, I didn't want them to go to waste. I started working on a contract basis with PKP and then just coincidentally all the things about

> doing workshops in Latin America came about just because I was going to be there and they wanted someone to run workshops there.

CMP6's work in Latin America is a good example of project work evolving, for lack of a better term, organically; his role holding workshops there was the result not only of his being partially from Latin America, speaking Spanish, and having an interest in development in that area of the world, but also from the fact that a major code contribution had come from Brazil, and there had been a surge of interest in the software in that region. This highlights the situational aspect of the project. Similarly, many aspects of the PKP/OJS project can be described as spontaneous rather than strategic (or maybe strategically spontaneous). As CMP6 continues: "I sort of fell into the whole scholarly publishing in the world by chance." Despite this, all of the core members of the PKP/OJS team--including CMP6 held very similar opinions and ideals regarding their commitment to open source software as well as to the purpose of the project and to the cause of open access.

The PKP/OJS developers differentiated themselves within the matrix of employment within the SFU library as they described themselves as "independent consultants" for the SFU library. As CMP4 explains: "The SFU Library is paying for everyone, with some of the money coming from the Synergies (http://www.synergiescanada.org/) project funding, and others directly from the Library." This is corroborated by CMP5 who was also an "independent consultant." I should also add that occasional expenses that don't fall under the Synergies funding or cannot be covered by the SFU library's budget have occasionally (once, as far as I recall) come from some of John's funds at UBC, but that is extremely rare." The title of 'independent consultant' is an interesting discursive construction because of how it separates the developers away from the common work of the library, into a class of its own. It speaks to the developers sense of themselves and the work that they are involved, which is different than other

SFU library employees. It is also speaks to the gender dynamics at play in this situation: research has shown that open source software communities are almost exclusively male (David, Waterman and Arora), which is an important characteristic considering how it is often associated with anti-establishmentarianism (Marshall). That the all male OJS software developers represented themselves as independent consultants within this social context is interesting from a gender perspective because of how the social world of the OJS intersects with the social world of the library, which is, undeniably feminized. In short, the message seems to be: librarians are women, whereas developers, information professionals, a.k.a independent consultants, are male. This is complicated even further by the fact that one of the respondents was actually a former librarian, and one was pursuing an advanced degree in information studies. More research into the particularities and the power dynamics of this situation needs to be conducted, however, it is the interplay of these characteristics which point to the notion that the subjectivity being described here gendered male, and furthermore, academic cyberprojects, on the whole, are gendered male.

Geeks and Anarchists: Understanding the identities of PKP/OJS programmers

What is most notable about the conversations with the core developers was the strength of their personal identities, and how these identities connected to their work. This was at the root of the common bond that CMP5 described above, and is connected furthermore to how the developers ended up working together on the PKP/OJS. Much of this bond is discursive, as the core developers all employed and participated in similar discourses--"information wants to be free"--when describing their work and their reasons for participating in the PKP/OJS project. The developers tended to adhere to some form of identity label, and these classifications were always tied to their practice of open source software development. As examples, two of the developers

were self-proclaimed “geeks” and admitted that their geek-like proclivities were what lead them to open source software development. One developer named himself “a slight closet anarchist (CMP1)” and felt that his work was a “subversive activity.” With regards to the former typology, CMP3 explains:

> [W]ell, because I am also kinda geeky. I was drawn to librarianship working as a library assistant, and then working as a systems tech after that, at the Vancouver Public Library… I just enjoy that software environment and then found that there was something that was within my interest in software that then meshed with my political interests and that was open source.

The other self-proclaimed ‘geek’ expressed a sincere love for the programming that he does and explained:

> I do the work I do because I have been fortunate enough and if you can have the opportunity to love your work then you should go for it. If I woke up tomorrow and won the lottery, I would continue to work on OJS. Like if I were independently wealthy, I would occupy my time developing open source software (CMP5).

For the lead developer in the project it was important for the PKP/OJS programmers to harbour a love for open source software development as opposed to simply having software development skills, while also being involved in an unrelated hobby, this being part of the right ‘mindset’ for working on the project. As he states:

> We were doing some interviewing to potentially hire some people as well, and that played a big role in it- you know, what interest people had in open source. One guy was a cyclist and you know, it’s irrelevant, but it is the right mindset - as a group it’s definitely important. And everyone ... the work ethic people put into it –it’s been very visible that people aren’t just there for their eight hours and then they go home (CMP1).

What was interesting about the core developers was their attitudes and relationship towards their work. They saw their programming as part of who they were as people, enmeshed with their personal and professional ambitions, and as an expression of themselves. This is what CMP1 meant by having the right ‘mindset’ for the project, and it was a characteristic that was common to all of the core developers, and defined them as group. Additionally, the developers displayed a

high level of commitment towards open source software development specifically, as well as a critical attitude towards proprietary or commercially produced software. As CMP1 explains:

> I think when you remove the dollar signs as a mandate for why I am working on the project, all of a sudden people... are more trusting... I am more trusting of users. And the users have been more trusting of us as a group (CMP1).

The developers supported the popular view of the superiority of open source software viewing it as a way to design the best possible software for the needs of their users. As he CMP1 describes:

> With my own work for example there is a complete separation between where the money comes from and what the money dictates and what the users are saying, and I'm free in most cases to do what is best for the users because we don't have that conflict of interest.

He also felt that open source software users had a different relationship with the software than they might have with commercial software. As he states:

> The guys who buy into the OSS process, they know it's participatory, they know they are getting free software, that they can do whatever they want with. Not only do they come back to us and want to contribute, which is fantastic, I love it, but they are more willing to come back to us and say what they need (CMP1).

Interestingly, while CMP1 expressed how important it was that the project was open source, how satisfied he is with how the open source aspect is playing out in the design of the software, and how important it is, furthermore for the other developers to buy into the open source development process, he also admits that his being involved in an open source software project was his good fortune as opposed to an active sought out choice. As he states:

> That was pure luck, but it is a big deal for me because I've been ... I'm fairly passionate about open source- I have been using open source exclusively for years now, and it is my first experience working on an open source project on any major scale. I have contributed to the odd thing before, but on a major scale this is the first. And it has been a really big part of it although it is pure chance that I've got into it (CMP1).

Despite the element of chance, the lead developer's comments display a strong belief in not only the *process* but the *product* of open source software.

In addition to the lead developer, all of the other core PKP/OJS members held strong beliefs in the ideological possibilities that open source software development offered. Not only did they agree that open source ultimately lead to higher quality software, but they also held strong opinions about open source software's role in their vision of the Internet. As with many advocates of open source software, they viewed cyberspace and the Internet as a public space, and wanted their work to be a contribution. As CMP3 states:

> I think politically and ideologically there is a lot to be said for openness; I think though it can also result in better software; I mean the best description I have heard about OSS is 'peer reviewed software' and I think that's very true and very important. And as a librarian I find that there's a lot of compatibility between my professional ethics of open access to information and the philosophy of OSS as well.

CMP5 makes a similar point- but in a more aggressive manner. His involvement in the PKP/OJS project was a very direct rejection of the commercial software world which in his view was corrupting the authentic character of the Internet. For him, coding open source was part of a larger fight to keep the Internet open. His adversarial attitude towards commercially developed software is revealed in his comments about the demise of many 'dotcom' companies. As he explains:

> It has to do with the fact that we [open source developers] really felt threatened. The Internet was losing that public exchange aspect to it at that period. But at the same time, that collapse of it was a real point of rejoicing for us because we saw that it couldn't be sustained. It was like, they came in, they tried to put dollar signs on the Internet and it didn't work. Now whether it was through their own folly or through grassroots or push back, I really don't know the reason for it. But I think the rise of open source software and Open Access, these premises that are completely aligned with the original appealings of the Internet, the fact that those have become much more prevalent is kind of a resurgence of hope for us. I mean it is for me, I am looking back, and it is 2007, and the Internet is in better shape than it was 6 –7 years ago, and the popularity of open source has to do with that (CMP5).

CMP5's comments and perspective resonate with other scholars interested in the phenomenon of free and open source software, and the relationship of software developers to the code they

produce. For Kelty this is what he describes as a "recursive public" which is a "public vitally concerned with the material and practical maintenance of its own existence as a public"(3). In her essay, Chun explores the practice of software development as a "fetish"(310) that falls somewhere in between discovering knowledge, creating art and making magic. The developers, I would argue, display a similar devotion towards their work, and the Internet, and it explains, to a degree, their rejection of the corporate world. As with CMP5, CMP6's involvement with the PKP/OJS project was a rejection of the corporate information technology world. As he states:

> [W]hen I was finishing my undergrad in Computer Science, I decided I didn't want to work for a tech company producing software. I think that decision as I was finishing in my last year I just said no; I had friends going off to Microsoft, friends going off to Amazon. I was like that's not for me. That was from an ideological perspective that I made that decision (CMP6).

The core PKP/OJS developers saw the Internet as something more important than simply a space in which data and information was exchanged over networks, or where people could purchase commodities online. Rather, they adhered to a vision of cyberspace as a place of ideas, in which these ideas are circulated and exchanged and through this exchange, grow and morph into other ideas. Software development for them was a part of this intellectual exchange and "intellectual pursuit" (CMP5) and their participation in the project was an extension of these beliefs. The PKP/OJS community mimicked the work and social life of academic scholars known for their participation in gift economies. This is the basis for the contention that the developers' work in open source software connected to their visions of themselves and to the very core of their identities. One key question is, To what degree did the OJS developers cultivate their identity, based on pre-conceived notion of hackers and developers?

Open source software development for equity, development and democracy

The PKP/OJS developers' motivations for working on the project is bound up, as well in their vision of the cyberspace, and the social and cultural impact it is having on the world. Thus

far it has been shown that even though the developers all came to the project in a somewhat haphazard manner, and even though they all preferred to work on the project in a flexible and contractual fashion, they felt that they were contributing towards their vision of what the Internet should be through their open source software work. Their comments regarding their rejection of the commercial world show how much they believed in their vision, while also providing a sense of their vision, which was on the whole rather cohesive. For the PKP/OJS developers, cyberspace was inherently an open, free and public space since as CMP1 states succinctly: "information wants to be free." According to CMP1 the Internet facilitates a form of equality, worldwide, that has never before been possible, specifically through the ability to access knowledge and information. He believed that online:

> [T]here is a great levelling of society- you don't know where someone is coming from, you don't know who they are, what their background is. Bill Gates is equivalent, name aside to somebody from the Congo for example.

Other developers used terms such as "democratization" (CMP5) and "decentralization" (CMP4) to describe the impact that the Internet and cyberspace were having on the world, which is why they felt that the privatization of the Internet would only be a barrier to this purpose. For CMP5 the Internet was allowing for "an overall democratization of knowledge coming out of research oriented institutions, mainly, university institutes". For CMP4, the more open source software that was available online, the better since "it's the decentralized model that is empowering for individuals to take the tool and become the expert themselves." Ultimately for the PKP/OJS developers cyberspace was strengthening democracy, freedom and equality, and open source software development was a foundational part of this. Of course, this view of the impact the Internet as an equalizing social tool is not exclusively held by the PKP/OJS developers. Indeed,

it is one of the many potent discourses that has developed and been disseminated around notions of the Internet since it has become more widespread.

While the developers identified more with the project as the main organizational structure in their professional lives, they all agreed that there was a strong synergistic relationship between open source software and the contemporary social roles of public universities.

> I think the culture of experimentation is supposed to be part of every university. How far they are willing to take that is another question, but I think that ideal of a university is a benefit to open source software, whether they[universities] recognize it as such is another question. And I think the thing that works against it would be bureaucracy (CMP2).

This synergy is based on the notion that open source software development is in and of itself a form of knowledge creation and as one participant explains: “I mean that’s our game. For the university, it’s about knowledge creation” (CMP4). This synergy was furthermore strengthened by the function of the project, the publication of online open access journals, and so the entire effect of the PKP/OJS, according to the developers was part of a larger cultural shift. As CMP5 states: “I think the fact that we can point to half of the journals out there being in Africa and South America is a very powerful statement, and I think that is something that OJS and open source software are facilitating, is that transition, I want to say a shift in power essentially...” The developers, therefore, saw their work as enabling change. As CMP4 states: “I think it can change people’s lives. I think it is difficult to point to a dramatic example that’s particularly useful, but I think it’s a process that’s transforming a culture that happens bit by bit .” While most of the PKP/OJS team members were enthusiastic about the transformational effects of the PKP/OJS, one core developer, who did much of his work in Latin America, expressed ambivalence about how truly effective the PKP/OJS was for change. As he states:

> I’m not sure if promoting…the goal of let’s say the PKP and the purposes of helping journalists, people that are trying to present their findings, is a good field that I can get

> wholeheartedly behind. I'm not sure how much…how much good it does in terms of the bigger picture (CMP6).

He also admitted however that the project was raising the profile of scientific research for countries that were previously unable to disseminate their research, and "that's something that I have a big interest in especially now that I'm sort of working in South America and I have aunts and uncles that are university professors. That whole world is excluded from everything; publishing is just one aspect". Interestingly, for the PKP/OJS developers, transformation and change translated essentially to the implementation of the PKP/OJS software in developing countries. As the project has grown increasingly global- as it has been adopted by institutions around the world- this attitude has become more pervasive. For the developers, the "philosophy of openness" which their software system promoted, was based on the idea that the software's value was opening up avenues for universities previously excluded from the academic knowledge network. As one core member of the project stated: "Again with the conference this week--that was the whole point--looking at how we can get the delegates of the developing countries involved and finding sponsorships for them; so it is a big part of it" (CMP2). As the connection between the PKP/OJS and global development work has grown stronger the developers' work has become more global. The developers viewed open access and open source as empowering for what they called "developing countries", and wished to pursue this aspect of the PKP/OJS work as they believed that this is where their work would have the greatest impact. Some scholars, such as Haider, are critical of attempts to "empower" through digital open access projects worrying that they simply reproduce pre-existing colonial relationships and perpetuate a problematic dominant epistemology (science). Others however, such as Kirsop, Arunachalam and Chan argue that opening up access (and providing adequate technology tools to enable the

process of open access) strengthens, in a reciprocal fashion, scientific communities everywhere and facilitates indigenous forms of science (1361-3200)[2].

The main indication that the developers' work was global–that they were becoming global agents--is based on the fact that, increasingly, travel around the world is a major part of their job. As one developer states: "I think I've been on airplanes more times in the past two years than the total of my life beforehand. Australia this past December and now Michigan next month. The hardest part is keeping my passport up to date. [CMP4] has been a jet-setter for ages, though. Lucky bastard ;-)." CMP4 also describes increased travel as ongoing part of his job. As he states:

> Yes, there is a fair amount of traveling. I was on the road on average of about once a month. My schedule for 2008 included Australia, Vancouver, Toronto, Italy, Bulgaria, and Germany. For 2009, I'm booked to go to Indianapolis and Baltimore so far. I know CMP1 is on his way to Vietnam soon.

"Jet setting and globetrotting" (CMP1) have become accepted functions within the role of the PKP/OJS developer, and as such, an important dimension of the subjectivity being described here. What developers do on these trips is spread the discourses of the PKP/OJS project through common academic activities such as conferences and workshops. This speaks to the notion of how universities are engaging, increasingly, in new global knowledge circuits. The idea is often raised in discussions about contemporary higher education (Gibbons et al.), but rarely is there any grounded evidence of how this occurs. Academic cyber-developers are agents that contribute to the development of these networks.

[2] For a compelling example of this, see Chan's video, filmed during Bioline International Open Access week, of Professor Abukutu of Jomo Kenyatta University of Agriculture and Technology discussing her dissemination of research into African indigenous vegetables: http://vimeo.com/10169351.

Conclusion

The developers described in this essay represent a subjectivity that is becoming more common as university-based open-source software projects proliferate. The five developers that participated in this research project held common ideals regarding their work, and these connected deeply to their personal identities. They rejected commercialism, challenged the commodification of knowledge, and believed that open source software could participate in the act of increasing global democracy and equality. Their experiences with the PKP/OJS in developing countries became a major dimension of their work and they enjoyed the flexibility that their jobs provided. What is interesting is how they identified strongly with the PKP/OJS project, which may point to the potency of emerging and/or reconstituted institutional structures. Last of all, the developers engaged in discourses connected to their work and identities regarding information, equality and freedom that they disseminated throughout their travels and their positioning as global agents. The story of these developers, I believe, says something interesting about the wider situation of Canadian higher education. On the one hand, their work helping to facilitate open access shows, in a sense, how grassroots digital social movements hosted within a public university can work to sustain a traditional Canadian academic value--public education--in a new way, particularly as it continues to disintegrate within the current economic climate. On the other hand, despite enjoying their flexibility, the subjectivity points to another channel of contingent employment within academic capitalism, unless perhaps appropriate policies are developed to address this emerging professional group. Like many academics, the OJS developers, who at this date are still employed as independent consultants, are not in it for the money. What the theorizing of this subjectivity points to are some of the issues that arise, for better or for worse, as Canadian higher education institutions inhabit ‘the condition of publicity’.

The academic open source software subjectivity, as exemplified by OJS developers, represents one way in which universities are changing structurally as a result of the Internet while also reproducing existing norms and power dynamics. This subjectivity works to bring academic work into cyberspace, and also shows how the work of universities takes place not only via the traditional networks of researchers and academics, but also by, potentially, this new and reconstituted set of professionals who are neither academic faculty, students, or staff.

This portrait of the academic open source developer subjectivity is based on interviews with only five developers, a very limited sample, all part of the same open source software project. Since many open source software projects are being developed in academic environments, it is safe to assume that there are more academic open source software developers working in universities. More research needs to be conducted on this subjectivity, paying attention to the power dynamics between them and the people with whom they work, particularly in developing world situations.

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