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12-1-2010

Mobilizing User-Generated Content For Canada's Digital Advantage

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Citation of this paper:

Trosow, Samuel E.; Burkell, Jacquelyn; Dyer-Witheford, Nick; McKenzie, Pamela; McNally, Michael B.; Whippey, Caroline; and Wong, Lola, "Mobilizing User-Generated Content For Canada's Digital Advantage" (2010). *Library and Information Science Publications.* Paper 21.
http://ir.lib.uwo.ca/fimspub/21

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F I M S U G C R E S E A R C H T E A M
Faculty of Information and Media Studies
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MOBILIZING USER-GENERATED CONTENT FOR CANADA'S DIGITAL ADVANTAGE

Prepared for Social Sciences and Humanities Research Council of Canada

Knowledge Synthesis Grants on the Digital Economy

FIMS UGC RESEARCH TEAM

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December 1, 2010

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0.0 Executive Summary

The goal of the *Mobilizing User-Generated Content for Canada's Digital Content Advantage* project is to define User-Generated Content (UGC) in its current state, identify successful models built for UGC, and anticipate barriers and policy infrastructure needed to sustain a model to leverage the further development of UGC to Canada's advantage. At the outset, we divided our research into three domains: creative content, small scale tools and collaborative user-generated content.

User-generated creative content is becoming increasingly evident throughout the technological ecology through online platforms and online social networks where individuals develop, create and capture information and choose to distribute content through an online platform in a transformative manner. The Internet offers many tools and resources that simplify the various UGC processes and models. Social networking sites such as Facebook, Twitter, YouTube, Vimeo, Flickr and others provide functionality to upload content directly into the site itself, eliminating the need for formatting and conversion, and allowing almost instantaneous access to the content by the user's social network. The successful sites have been able to integrate content creation, aggregation, distribution, and consumption into a single tool, further eroding some of the traditional dichotomies between content creators and end-users.

Along with these larger scale resources, this study also treats small scale tools, which are tools, modifications, and applications that have been created by a user or group of users. There are three main categories of small scale tools. The first is game modifications, or add-ons, which are created by users/players in order to modify the game or assist in its play. The second is modifications, objects, or tools created for virtual worlds such as *Second Life*. Third, users create applications and tools for mobile devices, such as the iPhone or the Android system.

The third domain considers UGC which is generated collaboratively. This category is comprised of wikis, open source software and creative content authored by a group rather than a sole individual. Several highly successful examples of collaborative UGC include Wikipedia, and open source projects such as the Linux operating system, Mozilla Firefox and the Apache platform. Major barriers to the production, distribution and aggregation of collaborative UGC are unduly restrictive intellectual property rights

(including copyrights, licensing requirements and technological protection mechanisms). There are several crucial infrastructure and policies required to facilitate collaborative UGC. For example, in the area of copyright policy, a careful balance is needed to provide appropriate protection while still allowing downstream UGC creation. Other policy considerations include issues pertaining to technological protection mechanisms, privacy rights, consumer protection and competition. In terms of infrastructure, broadband internet access is the primary technological infrastructure required to promote collaborative UGC creation.

There has recently been a proliferation of literature pertaining to all three of these domains, which are reviewed. Assessments are made about the most effective models and practices for each domain, as well as the barriers which impede further developments. This initial research is used as a basis for generating some tentative conclusions and recommendations for further research about the policy and technological infrastructures required to best mobilize and leverage user-generated content to create additional value in the digital economy internal and external to Canada.

Policy recommendations based on this research focus on two principles: balancing the interest of both content owners and users, and creating an enabling environment in which UGC production, distribution, aggregation, and re-use can flourish.

1.0 Introduction

In an environment where a Canadian teenager like Justin Bieber can leverage the reputation gained through YouTube videos into popular music stardom, a Canadian entrepreneur like Jordan Banks can take a leadership role at companies such as Facebook that host, distribute and manage user-generated content (UGC), and a Canadian firm like Research in Motion laments its inability to match Apple's success at attracting and marketing user-generated applications, it is clear that UGC has the potential to contribute to Canada's success in the digital economy. The digital revolution is not only coming from scientists, businesses and governments; users are critical not only as consumers of digital content, but, and perhaps most fundamentally, as *producers and distributors* of that content. *Time* magazine recognized this paradigm shift in 2006, when they named "You" as person of the year. Noting that the new web is a "tool for bringing together the small contributions of millions of people and making them matter", Lev Grossman, writing for *Time*, concluded: "We're looking at an explosion of productivity and innovation, and it's just getting started, as millions of minds that would otherwise have drowned in obscurity get backhauled into the global intellectual economy" (Grossman, 2006).

Many online media consumers, players, and users are now also media producers (Banks & Potts, 2010; Humphreys, 2009). Marketers have long been interested in leveraging consumer generated content in the form of customer feedback, reviews, product customization, and even customer-designed advertising campaigns to shape, improve, and promote their products. But increasingly, much of the web content generated by users does not fit this product-related mode. Instead, users are developing entertaining, evocative, and useful creative content, mashups, and software applications. End-users are no longer simply consumers and the value in UGC is increasingly co-created by the company and the consumer (Banks & Potts, 2010). Non-trivial components of the design, development, production, marketing, and distribution of media products occur through the direct involvement of consumers (Banks & Potts, 2010). Users are able to create or alter content through using the tools and infrastructures provided by companies.

Although UGC creators rarely receive direct monetary compensation (Cova & Dalli, 2009), user-generated content creates cultural, symbolic, and affective benefit while creating economic value that is enjoyed by others. In many cases, UGC producers are aware of the value they create and are sophisticated practitioners participating in the network of production (Banks & Humphreys, 2008). In some cases, UGC producers benefit from the contribution of themselves and others since they are participants in the platforms for which they create UGC. This is demonstrated by the ubiquity of UGC surrounding video game and virtual world modifications, social networking sites, online discussion forums, and websites inviting comments, editorials, and citizen journalism. These platforms not only attract the consumer but transform them into producers.

Yet, in other cases, these potential contributions do not come to full fruition for lack of access to necessary tools or infrastructure. In some instances, these contributions are derailed or suspended along the way after a certain point in their development is reached. An overarching goal of this report is to call attention to this problem and seek to devise solutions that will minimize barriers to the fullest possible utilization of this emerging resource which is often latent and tentative.

This report synthesizes the state of knowledge and identifies gaps related to the potential contributions of UGC to *creating Canada's digital content advantage*. We examine the types of content created, the organization and access of UGC, and the challenges faced by creators and audiences in developing, distributing, and consuming UGC. In our review of a broad range of literature, we have identified insights into three overarching and intersecting models of production and distribution of user-generated content. While recognizing that there will be overlap, we have divided our discussion into three domains:

(1) Individual textual, audio, image, video, and multimedia productions that are distributed online through software platforms such as blogs, podcasting repositories, Flickr, Twitter, YouTube, and citizen journalism sites;

(2) Software modifications or applications that are written by individuals to operate within or augment specific previously existing datasets or hardware or software platforms (e.g., iPhone applications or 'apps', utilities that manipulate publicly-available data sets, game or virtual world modifications); and

(3) Formal or informal consortia that collaboratively produce and distribute UGC, including open-source software (OSS), such as the Linux or Apache, and wikis, such as Wikipedia.

Our treatment of UGC extends beyond the creative content and game/virtual world modifications that are typically included in this category, recognizing new opportunities for user contribution to collaborative content and small-scale software applications such as the OpenBlock initiative (Vernon, 2010). Table 1 outlines and summarizes the scope of the three domains of UGC in our research.

Table 1: Project Breakdown: Three Major Domains

A. Creative Content	**B. Small-scale tools**	**C. Collaborative**
• User-generated content is content created, developed, captured and put on display by a individual on an online platform. • Content generated by individuals or small groups (not within virtual worlds, or gaming platforms) • More specifically platforms such as YouTube, Flickr, Twitter, and Facebook. • UGC where an individual (or small non-regulated group) is in control of creation of content and uploading it for delivery on a platform.	• Small scale tools are tools, modifications, and applications that have been created by a user or group of users. • Game modifications (mods), or add-ons, • Mods, objects, or tools created for virtual worlds such as Second Life. • User developed applications and tools for mobile devices, such as the iPhone or the Android system.	• Collaboratively created UGC is authored collectively and shared by a self-regulating group of contributors. • OSS includes both open-source software and free/libre software • Wikis such as wikipedia • Government data sets can be provided by any level of government

There are several areas of overlap among the three domains. Firstly, citizen journalism (1) can be found in content online by individuals and groups, as well as in virtual worlds, such as *Second Life*. Secondly, collaborative development between groups (2) is found in each of the domains. Thirdly, there are many cases of individual contributions to a collective (3), such as Wikis or discussion forums. Finally, issues of ownership, copyright, digital divide and policy generation (4) span the domains.

Figure 1 illustrates the intersections of the three domains in terms of overlapping content.

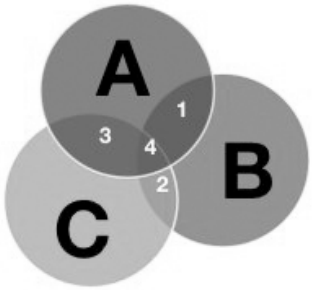

Figure 1: Intersection of the three identified UGC domains

1.1 Context of the Present Study

The context of this present study, following the publication of federal government's consultation paper *Improving Canada's Digital Advantage: Strategies for Sustainable Prosperity* and the ensuing consultation, is the changing nature of information and communication technologies (ICTs) and the way they are being used by Canadians. The proliferation of user-generated content is perhaps the most significant development in the field of digital content creation over the past decade. As noted in *Improving Canada's Digital Advantage*, "new and increasingly more affordable technology is putting creative control directly in the hands of consumers and creators" (Canada, 2010, p. 24).

Yet UGC remains underutilized, understudied and, with respect to public policy, greatly misunderstood. One of the main features of UGC is that its creation by non-professionals effectively straddles market and non-market interests. A 2006 OECD study noted that "most user-generated content activity is undertaken without the expectation of remuneration or profit. Motivating factors include connecting with peers, achieving a certain level of fame, notoriety or prestige, and self-expression" (OECD, 2007). As a result, it can be difficult to define the economic value of UGC and it is therefore difficult to assess its potential contributions to economic growth and the general welfare.

Understanding the various and often disparate motivations of the creators of UGC is crucial, and it is a prerequisite to the crafting of appropriate public policies. The assumption should not be made that the motivations of UGC creators are necessarily the same as the motivations of firms. It is often the case that end-users are not engaging in creative activity based on direct economic incentives. They are often interested in

increasing their own self-knowledge and social efficacy or in contributing to the larger community (Bonsu & Darmody, 2008).

For example, an important aspect of Wikipedia's success has been its ability to have and encourage content contributed by users voluntarily. One study of Wikipedia contributors revealed that their primary motive was fun (Nov, 2007). Another example is that within *Second Life* –and most virtual worlds of its ilk – there is an expectation that most, if not all, users will create content. Residents are empowered to be creative collaborators in the production process (Bonsu & Darmody, 2008).

Market structures produce content specifically meant for successfully generating return while individuals are motivated by a variety of idiosyncratic factors (Elkin-Koren, 2005). More importantly, UGC serves as a valuable outlet for self-expression and aids in social worth and community building (Elkin-Koren, 2005). The precarious state of UGC creation as a form of unpaid labour is veiled by the perception of such creation as a leisure activity or extension of play (Kücklich, 2005).

Given these crucial differences between the processes and motivations underlying the production of UGC, special attention needs to be paid to the best method of harnessing UGC to spur innovation. For example, given the complex and dynamic interaction between collaborative UGC and traditional intellectual property devices, the government must make a concerted effort to carefully balance policy choices to maximize innovation in a very different context than was traditionally present. The industrial model of innovation that emphasized the importance of centralized research and development departments is no longer applicable to intangibles (Strandburg, 2009; Maxwell, 2006), and the proliferation of user-generated content evinces that innovation policies premised on large, centralized players no longer holds (Borgne-Bachshmidt et al., 2009). There are numerous examples throughout history of the roles users/customers play in facilitating innovation. The *Oxford English Dictionary*, the early automobile and the home computer all benefited from the innovative activity of users (Maxwell, 2006). The history and success of Open Source Software (OSS) demonstrates that proprietary rights are not always necessary to stimulate innovation (Zittrain, 2004). Merges (2004) notes that over the past several hundred years social norms of sharing and reciprocity have been equally important as exclusive rights in advancing innovation. A study by Statistics Canada in 2000 found the common perspective that patents encourage

innovation was incorrect; it was, in fact, innovative activity that resulted in increased patenting (Baldwin, Hanel & Sabourin, 2000).

Pointing to different assumptions that might apply to UGC from traditional business models is not to suggest that firms should not be concerned with the development of the area. Businesses and organizations are recognizing the benefits of incorporating UGC into their online marketing strategy (SEO Internet Marketing, 2010). Armstrong and Hagel (2000) indicate that the Internet presents a social and economic opportunity for businesses to capitalize on electronic communities. Leveraging user-generated content means allowing and encouraging interactions between electronic communities that will enrich the experience for UGC consumers. This also entails anticipating management in supporting, designing and operating online communities, and creating new roles in organizations.

User-generated content is particularly important as part of an innovation strategy because the type of content produced by users will differ from the type of content produced by firms (Elkin-Koren, 2005). Wikipedia and Linux demonstrate that users can collectively and collaboratively create and maintain complex products (Tapscott & Williams, 2008). While UGC may be viewed by some as a threat to existing content providers, it should be seen as complementary, and an important part of any government digital economy strategy.

The concepts of "crowdsourcing" (Shirkey, 2008), "wikinomics" (Tapscott & Williams, 2006), and the "long tail" (Anderson, 2006) have been widely hailed in the business world as ushering in new and empowering democratic models of production and distribution where power is shared between producers and consumers. Co-creative media production, however, sits uncomfortably with our current understandings and theories of work and leisure (Banks & Deuze, 2009; Sotamaa, 2007). Tensions between ethical and economic models of production and definitions of value relating both to social impact and to monetary accumulation destabilize many takens-for-granted (Arvidsson, 2008). The collaborative construction of new media products is linked with more than the creation of economic value; it is argued to be inextricably linked with civic engagement (Harrison & Barthel, 2009). The importance of non-market motivations may lead to tensions over achieving economic sustainability without sacrificing non-market ideals (Chege, 2008). Since the collective ethic of content creators embraces unpaid rather than

paid labor and offering products at no cost (Ritzer & Jurgenson, 2010), user-creators' labour may be exploited and the labour of waged digital workers may be devalued, rendering their status all the more precarious (Fuchs, 2009; Banks & Humphries, 2008; Gill & Pratt, 2009). Furthermore, recent scholarship on user-generated content cautions that these models of production are double-edged; the very mechanisms that allow for creator freedom also offer avenues for entrapping the user to produce for the firm (Petersen, 2008; Zwick et al., 2008; van Dijck & Nieborg, 2009).

Not surprisingly, the destabilization of many traditional dichotomies such as producer/consumer, labour/leisure, and economic/social value has led many to conclude that the policy infrastructure developed for a traditional market model is ineffective in a UGC model. UGC forces redefinitions of what content is, and who produces, owns, and has access to it (Grimes, 2006; Humphreys, 2009), who is liable for damage (Valcke & Lenaerts, 2010), and what constitutes fair use (Collins, 2010). UGC has a profound and sometimes disruptive impact on matters relating to regulation, governance, and culture. It requires an expansion of what democracy means and what it entails in the digital networked environment (Dizon, 2010). Additionally, the UGC production and consumption models make new demands of the tools of production, calling for different socio-technical affordances, including functionality and architectural choices, customization and tailoring mechanisms, software and content copyright licenses (Dorner et al., 2009; Scacchi, 2010; Obrist et al., 2008).

The goal of this report then is to develop a deeper understanding of the process of user-generated content creation and dissemination in order to enable an understanding of the infrastructure requirements that will promote successful leveraging of this user-generated content as part of Canada's digital content advantage: "The talent is here; if the framework is right, more talent will surface, the demand will be there and Canada will be a destination of choice for investment and innovation" (Canada, 2010, p. 26).

2.0 Definition and Current State of UGC

2.1 General Definition of UGC

We define user-generated content as content that is voluntarily developed by an individual or a consortium and distributed through an online platform. A similar definition, "…content that is created using tools specific to the online environment and/or disseminated using such tools" was suggested by Gervais (2010, p. 465).

UGC may or may not be moderated before it is distributed and the creator may or may not share ownership of the content. In contrast to UGC, engineered content is "created by established knowledge experts and content owners" (Chin, 2006) and is usually edited by an authority or expert on the matter. UGC is developed, distributed, and consumed in many different formats. Material can be in the form of audio, video, text, augmented reality, and code, or combinations of these formats (Alikiliç and Üniversitesi, 2008). Depending on the platform, operating system, resources, and user ability, UGC content can be created and distributed via a plethora of delivery systems. For the purposes of this report, we have divided this wide variety of UGC into three broad categories.

(1) Creative content authored and distributed by individuals or small informal groups

Individuals, working alone or informal groups, create a wide variety of content forms, which they may distribute through online platforms including social networks. Content can focus on any topic and although its ultimate utilization may require format-specific hardware or software such as an MP3 reader, the content itself is platform-independent. For example, a photograph may be published to the creator's own webpage, posted to a blog, posted to a dedicated photo sharing site such as Flickr, posted to a social networking site such as Facebook, or uploaded to many other online repositories. Content may be posted for the benefit of the creator's social network, but it may also serve to enhance the creator's reputation and possibly bring financial gain, for example when a magazine editor arranges to publish a Flickr photo.

(2) Software modifications or applications written by individuals to operate within or augment specific previously existing datasets or hardware or software platforms

These are small tools that have been created by a user or an informal group of users for a specific hardware or software platform or to provide access to a pre-existing data set. While the term "apps" has become popularized for software applications designed to run on mobile phone operating systems, a standard industry-wide definition of what is and is not an "app" does not currently exist (Purcell, Entner & Henderson, 2010). We discuss three forms of small-scale tools: (1) mods, add-ons, virtual objects and/or tools created by users of games such as *World of Warcraft* or virtual worlds such as *Second Life*; (2) apps that manipulate, analyze, or provide access to publicly available data sets such as Natural Resources Canada's GeoGratis and the City of Toronto's Open Data Framework; and (3) user created applications and tools for hardware platforms, most notably mobile devices, such as the iPhone or Android phones.

(3) Content collaboratively produced and disseminated

Collaboratively created UGC is authored collectively and distributed by a sustained, though evolving, self-regulating group of contributors. Although any form of creative content can be created in consciously collaborative manner, this report considers two primary forms of collaborative UGC. The first is open source software (OSS), which will be defined broadly to include both open source and free/libre software. The second form, commonly referred to as wikis, are software platforms designed to facilitate collaborative writing, posting, revision, and tracking of the history of projects.

2.2 Current State of User-Generated Content

The ubiquity of user-generated content has increased as the notion of 'everywhere' for consumers and producers has changed. The key to UGC's omnipresence is its accessibility. "It's not just about every desktop anymore. It's about every Internet-enabled device: cell phone, desktop, laptop, tablet, palmtop, PDA, Tivo, set-top box, game console, and so on" (Zawodny, 2004). Not only does mobile access allow UGC to be consumed instantaneously but the increasing ease with which content can be generated. "With the ubiquity of digital cameras in mobile phones and the dawn of faster Internet access, people have become well-equipped to exchange information through 'tweets', comments on discussion groups, or blogs" (Ubalde, 2010). With time,

UGC will become a viable competitor with Hollywood entertainment (Bear Stearns, 2006).

The basic hardware and technological infrastructure requirements for UGC range from the very basic (a computer with an Internet connection) to the highly specialized (mobile devices, data capture devices including digital cameras, video cameras, GPS units, game consoles, etc.). Although the 'digital divide' remains an issue – one that cuts across all three of domains of this report – the latest Statistics Canada results (Statistics Canada, 2007; Canada Year Book, 2009) suggest a large majority of Canadians access the Internet (73% of those 16 and older). Furthermore, younger people are likely to be online (96% of those aged 16 to 24), and will continue to be Internet users as they age. It appears the majority of those with the desire to create UGC have the capacity to access basic computer technology for connecting to the Internet and creating text-based content, if not in their own homes, then through public access terminals in locations such as libraries.

Yet differences persist based on education and income – issues to which must be addressed to maximize the ability of Canadians to contribute UGC. Policies need to be put in place to ensure that some Canadians are not disenfranchised with respect to their ability to create UGC by virtue of a lack of technology. One area where the digital divide is particularly problematic is in the uneven access to broadband Internet. Rural areas remain underserved with respect to high speed Internet access in Canada. The Canadian government recently launched the third round of Broadband Canada funding (Industry Canada, 2010): 21 projects that will connect 30,184 Canadian households to broadband networks. The goal of the program is to provide broadband services at a reasonable cost to unserved and underserved Canadian households. Consistent and comprehensive high speed Internet connectivity will be a critical infrastructure requirement of Canada's digital content advantage.

2.2.1 Current State of UGC: Creative Content

Many users create textual content in the form of reviews, blogs, network postings, and other productions. These productions appear in a broad variety of forms: as content in individual websites, comments on fora or discussion groups, blogs, contributions to citizen journalism, or as articles in zines, to name a few. Textual forms of UGC are

common. Blogs began as online diaries and web logs as early as 1991 (Blood, 2002), and by November 2010, there were over 150,610,000 identified blogs online, with almost 78,000 new blogs created each day (BlogPulse, n.d.). Microblogging, such as that distributed via Twitter, allows users to "describe their current status in short posts distributed by instant messages, mobile phones, email or the web" (Java et al., 2007). Although only 7% of the American population posts to Twitter (Van Grove, 2010), there are well over 90 million Tweets per day (Rao, 2010). Figure 2 displays the demographics and segments of bloggers around the world, showing the majority of bloggers as hobbyists residing in the United States, (Sobel, 2010).

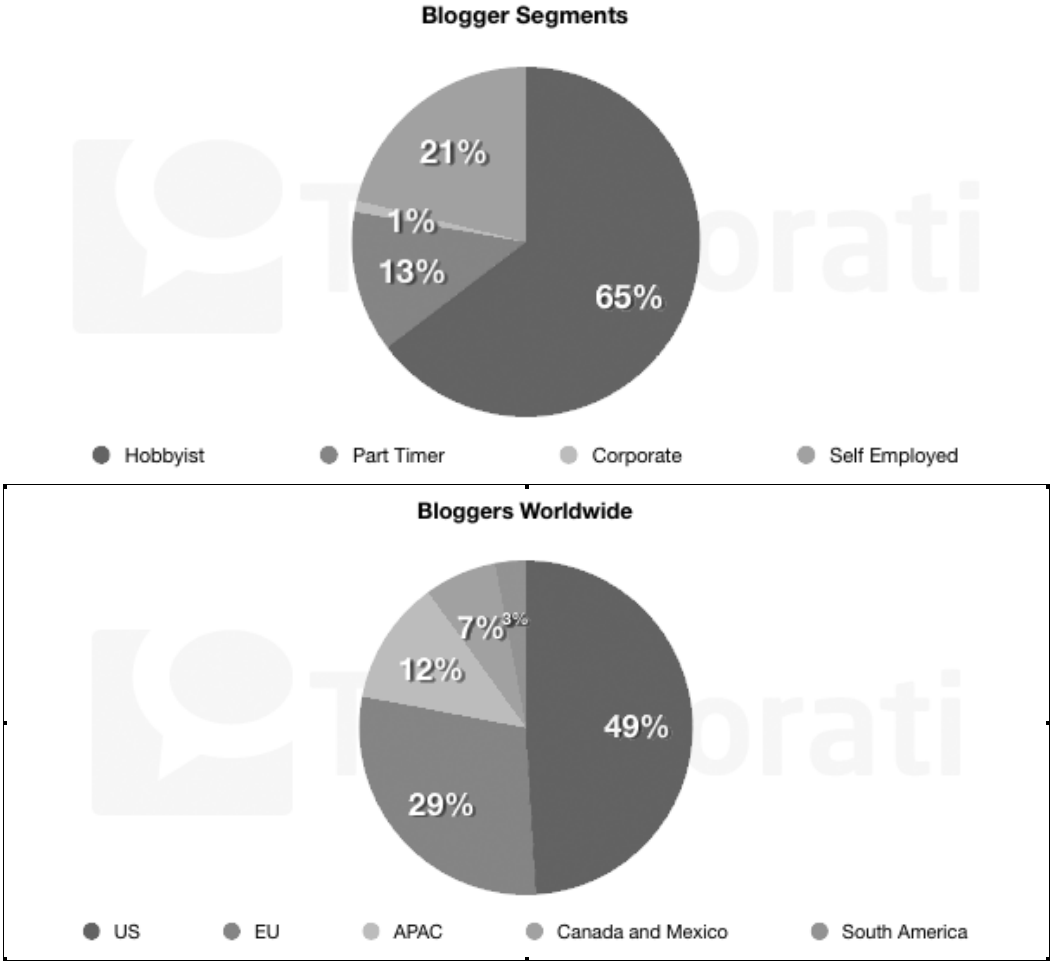

Figure 2: Demographics and Segments of Bloggers Worldwide

Audio, still image, video, and multimedia are other important formats of individually produced content. Currently, approximately 2.5 billion photos are uploaded to Facebook per month (Pingdom.com, 2010), while Flickr members upload over 3,000 images every minute (Sheppard, 2010). Every minute, 24 hours worth of videos are uploaded to YouTube (YouTube, 2010), and similar distribution platforms are being created for auditory content (MixCloud 2010; SoundCloud 2010).

Audio or video podcasts and vidcasts are normally a series of digital media are released episodically and made available for download through a web syndication service (What is podcasting, 2009). Podcast genres and styles are similar to blog topics and narratives: topics and themes vary from entertainment to editorials. Podcasting is gaining in popularity, with 45% of Americans aware of the format and 23% listening to and 20% viewing podcasts (Webster, 2010). The demographics of podcast consumption have changed, with more older listeners, while younger consumers choose on-demand content (Bodnar, 2010).

The hardware and software tools for the production of creative content can be very simple. Textual content, for example, requires only a computer and an Internet connection for upload/download. Other content forms require additional hardware: digital cameras for taking photographs, video cameras for creating videos, and software or recording devices for capturing audio. Although UGC often has lower production values than professionally produced content, software for text publishing, image editing, and video or audio editing are widely available.

One key characteristic of individually-created content is how quickly and readily content can be produced. For example, the most active publishers of user-generated video post over 1,000 videos over a few years while a prolific commercial film director may produce 100 films in 50 years (Cha et al., 2007). Mobile technology is a driving factor in user-generated content due to the ease with which devices can now capture and deliver content from almost any location: smartphone penetration in Canada was estimated at 12% in 2009 and Canada ranked first for content uploads in mobile media (Nielsenwire, 2009).

Not surprisingly, technological advances are changing the ways in which users create content. Some 40% of those who blog from a handheld device report that the technology encourages shorter and more spontaneous posts (Sobel, 2010). Digital

images can be captured with camera phones and be sent via MMS, Bluetooth, or be posted to a mobile blog and shared almost immediately (Kun & Marsden, 2007). New 3G and 4G cell phone networks enable the transmission of large amounts of live video from handheld devices (Grant, 2009).

2.2.2 Current State of UGC: Game and Virtual World Mods

Virtual worlds and games exist on a continuum of created, synthetic worlds, ranging from *ludic* (fixed synthetic worlds and goal-oriented games, such as *Super Mario Brothers*) (Pearce, 2009) to *paidaic* (open-ended worlds designed for spontaneous play and creative contribution, such as *Second Life*) (Pearce, 2009; Tschang & Comas, 2010). Many video games and virtual worlds allow players to have limited agency to create on top or parallel to the pre-designed game content (Burri-Nenova, 2009), with differences in the degree to which they allow and facilitate the production and distribution of content. User-generated content in video games or virtual worlds is not a new phenomenon: it can be traced back to 1961, with the creation of *Spacewar!* by a group of MIT students (Kow & Nardi 2010a). As with most forms of user-generated content, however, the opportunities for and instances of game and virtual world mods are rapidly increasing.

Mods are an important aspect of many gaming and virtual world environments, and user/participants create mods in part to increase their own enjoyment of the environment. Some even argue that game modding is a natural part of game play – an extension of gaming, not labour (Nieborg, 2005). Recent games such as *Spore* and *LittleBigPlanet* rely heavily on user-generated content. In *LittleBigPlanet*, players use editor tools embedded in the game to create and edit new objects and levels. Massively Multiplayer Online Games (MMOGs), such as *World of Warcraft* (WoW) or *EverQuest* also allow, and indeed rely on modifications, since they are designed to be changed both by the game publisher and the player population.). Virtual worlds depend to an even greater extent on modifications, since most are virtual spaces in which the majority of content is created by users. *Second Life* (SL), for example, is a full-scale three dimensional virtual space, in which residents, represented by a fully customizable avatar, create objects, buildings, clothing, and more using flexible building tools know as primitives, or "prims" (Lo, 2008; White, 2008). By the end of May 2004, residents of the virtual world SL had created over one million objects, over 300,000 objects with scripted

behaviours, and over 300,000 pieces of clothing (Ondrejka, 2004). Creations in SL include clothing, libraries, newspapers, and nightclubs, among many other items. Within SL, users are only limited in what they may create by their own creativity.

Many ludic games allow players to have a limited amount of agency to create on top of or parallel to the pre-designed game content (Burri-Nenova, 2009). Modification culture in the First Person Shooter (FPS) genre, for example, is well developed. *Unreal Tournament 2004*, an FPS game developed in part by London, Ontario-based company Digital Extremes embraced mod creation, providing all the necessary components such as an editor or toolkit allowing players to customize and design parts of the game world (Nieborg & van der Graaf, 2008; Nieborg, 2005).

MMOGs occupy the middle ground. When they are published, they are not completely set in stone: they are changed by the developer or publisher, as well as the player population through their engagements with the game, publisher, development team, customer service team, and each other (Humphreys, 2009). The development of online play, particularly in MMOGs, puts the issue of user-generated content to a higher level of prominence because they depend on participant activity. In the highly popular MMOG *World of Warcraft* (WoW), mods are used widely by the player population in order to improve playability. Kow & Nardi (2010b) identified nearly 4000 mods available for the WoW community. Customization of the WoW user interface (UI) is encouraged by Blizzard Entertainment, the company responsible for WoW. In their Exploitation Policy, Blizzard (2010) states that, "we definitely want people to create their own UIs utilizing custom menu configurations, graphics, and even sounds. Anything that can be coded to modify the style and the look of the UI is fair game, as long as the modifications are done to the sanctioned internal files of the game". WoW provides a UI customization tool, as well as a governance policy that enables WoW add-ons to reconfigure a WoW player's UI (Scacchi, 2010). In WoW, users may also create macros, small pieces of code that allow the character to combine actions with a single button.

The scope of content creators in the paidaic *Second Life* (SL) is limited only by their imaginations. Creators have access to flexible building tools know as primitives, or "prims" (Lo, 2008; White, 2008), basic 3D shapes that can be resized, reshaped, hollowed, modified, combined, and connected (White, 2008). Residents can add colour, textures, movements, and other details to create virtually anything (White, 2008). The

main content creation tools are an object editor and an interface that allows residents to create small programs in the Linden Scripting Language (Ludlow & Wallace, 2007).

Application Programs (Apps)

The term 'app' is a common abbreviation for an 'application program'. The term typically refers to small-scale programs designed to perform a specific task within a hardware or software environment. Apps have become particularly important since the advent of smartphones, whose multi-faceted mobile capability depends on apps that increase functionality and extend data visualization and integration capabilities. Apps are also an important aspect of social networking (e.g., Facebook). Web-based apps are typically online programs that integrate and redisplay data to promote use and interpretation. Although many apps are developed by professional programmers, there is a growing movement to support user-generated apps that often take the form of data mashups.

In some cases, apps rely on user or crowd sourced data. Some successful iPhone apps rely on this type of user-generated content (e.g., Sporcle, a quiz app, or Mimoa, a user-generated guide to modern architecture). There are many examples of 'crowdsourced' mapping applications that similarly depend on users to generate the value-added and geo-spatially located information that is subsequently presented by the mapping application (e.g., Waze, a crowdsourced navigation app). The blending of technologies (e.g., linking integration of GPS information with web access) and increasing mobility of technology is allowing for geo-spatial data and location based services such as Foursquare or Gowalla to become integrated with user-generated content (Zickuhr & Smith, 2010).

It is a relatively short step from user-generated content contribution to user generation of mashups themselves, and open source tools are being created to allow users more easily to create their own data mashups. Open Mashups, for example, touts itself as "a unique solution that empower[s] any creative user to design, run and share [their] own applications" (Desré, 2010). Users are also using open source software to design apps that manipulate aggregate data sets, specifically government created data sets that are made accessible to the public for the purposes of having citizens develop their own user-generated tools and applications. In London, England, for example, Chris Taggart

created a dashboard that provides a range of information on the Greater London Authority's spending (Greater London Authority, n.d.), and in London, Ontario, Fanshawe College student Aaron McGowan created the Next Stop app that allows people to access the London Transit Commission's transit information on their mobile device (Next Stop, 2010). The city of San Francisco's open data project has produced a range of apps including EcoFinder, an app that helps citizens determine the proper location to recycle various materials and Mom Maps, an iPhone application that maps kid friendly locations in the city (City of San Francisco, 2009). Data.gov has hundreds of apps available using a broad range of U.S. federal data (Data.gov, 2010). The District of Columbia's government provides a range of data sets that citizens can easily map using visualization software (District of Columbia, n.d.).

The recent development of smartphones has changed the market for mobile applications. Thousands of apps are now available for both the iPhone and Android phone systems. The release of the iPhone platform presented an unprecedented opportunity for one or two person teams to create apps that could compete against those from major companies (Wooldridge & Schneider, 2010). Guides are now available that assist users in the development and marketing of iPhone apps (Dudney & Adamson, 2009; Zdiarski, 2008; Woolridge & Schneider, 2010; Mark & LaMarche, 2009). Other open source software for app development is also being created. GameSalad (www.gamesalad.com), for example, supports non-programmers to develop game apps using a drag and drop interface. These tools are making it easier for users to go from idea to application, and are therefore likely to increase the number and range of user-generated apps and data mashups.

Open Data Sets for App Creation

The most open access to the materials needed for app creation is provided by open source and open access initiatives. The Canadian federal government provides large open-access data sets through Environment Canada and Natural Resources Canada (NRC). Several Canadian municipalities, including Toronto, Vancouver, Edmonton, Ottawa, Nanaimo, London, Mississauga, and Calgary, either provide or plan to provide access to data on a variety of topics from garbage collection schedules to transit station and library locations, in a variety of formats. The movement toward open government data is not unique to Canada; Australia and United Kingdom both make federal government data available from central websites. In the U.S., the Obama administration has prioritized releasing data through under the Open Government Directive (Orszag, 2009). Several portals have been set up including data.gov which is the principal source of data, but also specific URLs dedicated to health reform data, regulation information and data on the economic recovery. Major cities including London, San Francisco and New York have local government data available.

Resources may be provided by projects, cities, or companies in order to encourage users to create innovative tools and applications that can be used in a variety of different ways. In an effort to encourage app development, the City of Ottawa has created an Apps4Ottawa contest that includes prizes totaling $50,000 including five main prizes of $5,000 (City of Ottawa, 2010). The City of Edmonton allows not only citizens to create their own apps, but also hosts a webpage where citizens who lack the technical skills to develop applications can submit ideas for others to work on (City of Edmonton, 2010). As these examples of innovative uses of government data sets show, by simply providing access to data along with reasonable licensing terms (such as those found at NRC's GeoGratis site), the range of apps that citizens can create is quite broad. Some Canadian cities, including Ottawa and Edmonton, have taken measures to spur app production and increase collaborations between governments and citizens.

Development Kits for App Creation

In order to develop software apps for mobile devices, users need access to development kits. The open source Android mobile operating system, bought by Google in 2005, has a large and growing population of app developers. The Software

Development Kit (SDK) for Android is free to download from the Android developer website. Information is readily available on the Android development website, as well as in published books. Users are encouraged to download the latest SDK, as well as the Eclipse platform for Java, and use the developers' guide on the website when creating their app. The Android developer website also contains many Application Programming Interfaces, tools that will assist users in developing their apps, as well as a developers resource section, developer videos, and blogs. Access to iPhone development tools is limited to registered iPhone developers. There is a relatively low entry cost of $99US per year that provides the standard development kit, development tools and resources, technical support, and the ability to test and debug code on an iPhone, as well as ultimate distribution of an approved application through the App store. Development requires the use of an Apple computer, as well as the iPhone SDK and XCode software (Mark & LaMarche, 2009). Access to the Apple developer's website is limited to registered iPhone developers. Once registered as a developer, however, users have access to a plethora of resources from Apple to assist in development of their app.

2.2.3 Current State of UGC: Collaboratively generated content/software

Although many UGC creators work individually or in small co-located groups, the Internet also facilitates the production of content and software that is generated by larger and geographically distributed collaborative groups. Two examples are wikis and open-source software, both typically produced by a loosely associated and ever-changing group of user/contributors.

Wikis

Wikis are special type of webpage that is designed so that the contents can be edited collaboratively by those who access them. One of the largest and the best known wikis is online encyclopaedia Wikipedia (Myers, 2010). The English version has 3.5 million pages and there have been nearly a half billion page edits since its creation (Wikipedia statistics, n.d.). Wikipedia is currently the seventh most popular internet site in the world (Alexa, n.d.). Though Wikipedia boasts an impressive volume of content, most of the work is contributed by a small number of users (OECD, 2007). The success of Wikipedia has spawned many rival online encyclopaedic wikis. A major rival wiki

encyclopaedia is Citizendium which was launched by one of the original creators of Wikipedia, Larry Sanger (O'Sullivan, 2009). Citizendium has several notable differences from Wikipedia; it requires contributors to use their real names when creating and editing articles (*Why Citizendium*, 2010; Maddox, 2007), and uses paid experts in an attempt to improve user quality (O'Sullivan, 2009).

Collaborative wiki projects are not restricted only to encyclopaedias. The largest wiki is WikiCity Guides with nearly 13 million individual pages (Wikicity statistics, n.d.). The Wikimedia Foundation that operates Wikipedia also provides several other collaborative wikis including Wikitionary, a wiki dictionary, Wikiquote, a repository of famous quotations, and Wikinews, a news wiki (Wikimedia Foundation, 2010). The federal government has created GCpedia, a wiki for Canadian federal employees (which is not open to the public). As of March 1, 2010 it had over 12,000 registered users and nearly 6,000 pages (Wouters, 2010). Wikis have also become popular in educational and business settings (though such wikis are not considered UGC).

Despite existing for less than a decade Wikipedia has already surpassed the amount of content found in established print encyclopedias in every language (Lih, 2009). Though Wikipedia continues to grow, there has been a noticeable decrease in the rate of growth (Borgne-Bachshmidt et al., 2009; Lih, 2009). The quality of Wikipedia has been hotly debated. In 2005, the journal *Nature* published the results of a study comparing *Encyclopedia Britannica* with Wikipedia that found fewer errors in the latter (Giles, 2005). Though *Britannica* responded arguing that there were serious methodological issues with the study (Encyclopedia Britannica, 2006), *Nature* defends its findings (Nature, 2006). The success of Wikipedia has produced a backlash including sites dedicated to documenting erroneous articles and incidents of plagiarism (Wikipedia Watch, n.d.).

Open Source Software (OSS): Norms, Leadership and Quality Control

Open source software (OSS) refers to model of software production that is premised on making the human readable source code accessible, allowing users to study, change, and improve the software. OSS is thus a collaborative enterprise in that the users of the software are able to contribute to its ongoing development. Given the distributed nature of collaborative UGC, there are three central considerations that need to be

addressed which ultimately bear on the influence and usefulness of the project: they are norms, leadership, and quality and version control.

Norms

Collaborative UGC projects employ a combination of norm based governance along with leveraging the experience of veteran contributors to create a sustainable production and distribution model. This model offers several advantages over the traditional firm based approach. Collaborative projects have superior information processing capabilities, allow for larger organizations and minimize transaction costs (Benkler, 2002).

Norms play a significant role in collaborative UGC (von Hippel & von Krogh, 2003; Dizon, 2010; Benkler, 2002; Maxwell, 2006; Merges, 2004). The lack of physical boundaries present in tangible goods place an increased emphasis on social regulation in governing intangible objects including creative works (Elkin-Koren, 2005). A norm of sharing pervades OSS (Maher 2000). Norms also work to limit egotistical behaviour in OSS projects (Maher, 2000), and there is also a norm against taking open source code and converting it to a proprietary product for personal gain (Merges, 2004). Wikipedia also relies on social norms to help minimize the amount of nonfactual editorial content (Benkler 2002). More importantly, collaborative UGC draws on a range of incentive structures to motivate people and not simply a reliance on pecuniary incentives to motivate individuals (Benkler, 2002). Furthermore, in collaborative projects such as OSS, the fate of the group becomes a motivator for individuals (von Hippel & Krogh, 2003). By drawing on norms and a range of incentives, users are able to collaborate and produce works that are beyond the scope of the production of isolated individuals.

Leadership

Leadership is a second major factor in the success of collaborative UGC projects (Maher, 2000; Maxwell, 2006). In many open source software projects veteran programmers act as gatekeepers by deciding which code will be added to the authorized version of the program (von Hippel & von Krogh, 2003; Maxwell, 2006). It is a leader's responsibility to ensure that open source projects do not become forked, a situation where a divergence in views by contributors causes a split among the collaborative team leading

to two different versions of the same software (Lerner & Tirole, 2002). Leaders oversee the logistical problems involved in collaborative projects (Maher, 2000), and while they play a critical role in ensuring the success of OSS projects, they also must avoid attempting to control volunteers through a rigid hierarchical structure (Schweik & English, 2007). Finally leaders play an important role in attracting talented individuals to contribute to projects (Lerner & Tirole, 2002).

Through a combination of norms and leadership, collaborative UGC projects are able to achieve both version and quality control. Linux utilizes two hierarchically organized production streams with one group evaluating code to be added to the next official release, while a second team works on more experimental areas of coding (Maxwell, 2006). The Apache web server project is led by a core group of eight developers, but also includes a democratic voting mechanism to allow anyone who contributes to the project to vote (Weber, 2004). The examples of Linux and Apache, among the most successful OSS projects, demonstrate that issues related to quality and version control can be effectively managed through meritocratic, collaborative governance systems.

Quality and version control

Wikipedia and other collaboratively generated sources face quality control issues. In several well-publicized instances, Wikipedia has been manipulated for partisan political purposes (Maxwell, 2006; BBC News, 2009; CBC News, 2009), negatively portraying certain individuals and groups (Lih, 2009). Coverage is also an issue: while Wikipedia contains extremely detailed articles on Madonna, Star Wars and Pokemon, subjects including African and Middle East history are noticeably less thorough evincing that articles are not weighted according to their historical or academic significance (Lih, 2009). As a result of the controversy Wikipedia has adopted policies allowing for the quicker removal of questionable content about living persons (Lih, 2009). Despite its shortcomings, the Wikipedia has quickly developed into one of the most comprehensive sources of information available all through the unpaid contributions of users.

Quality control in open source projects is ensured through the large numbers of users that report bugs in software. OSS projects perform according to Linus' Law,

"given enough eyeballs, all bugs are shallow" (Raymond, 2000). The large pool of contributors helps ensure the quality of open source software. However, the advantages of OSS in terms of quality make version control more difficult. A lack of version control can result in OSS projects results in "forking" groups of programmers take the code in different directions resulting in programs that are no longer compatible. In the early 1990s the a lack of version control on the UNIX operating system derivative BSD resulted in the forking of a variety of versions of the operating system for personal computers. The FreeBSD project separated from the 386/BSD project, and subsequently NetBSD forked from FreeBSD, and OpenBSD forked off of NetBSD. Despite the increasing numbers of BSD variants, UNIX based operating systems lost market share to Microsoft's Windows NT as each version of UNIX resulted in a duplication of programmers efforts (Weber, 2004). Though the BSD case documents the problem of too much forking, Weber emphasis that, "too little forking (in other words, too much successful coordination) would be as dysfunction in a different way," by dampening innovation and variation in OSS projects (Weber, 2004, p. 170).

2.3 Best Practices

Successful models of UGC create an online presence. Successful sites and resources successfully integrate content creation, aggregation, distribution, and consumption functionality into one tool. Many of the social networking sites have a mobile device app that allows access to personal and public user-generated content. In some cases sites have multiple mobile and desktop applications from third party developers that offer different functionality to suit end users. Providing multiple points of access allows increase use in the software and more opportunity to contribute content.

The quality of UGC on sites based on user contributions is also a factor in successful models and practices. UGC quality "varies drastically from excellent to abuse and spam" (Agichtein et al., 2008, p. 183). As the availability of content in sites increases exponentially, the "task of identifying high-quality content in sites based on user contributions – social media sites - becomes increasingly important" (Agichtein et al., 2008, p. 183). Implementation of rating systems and comment sections by consumers or customers allow users to compare products and services based on peer-reviews. Users help improve what is on the web by "pointing people towards the good stuff and steering

them away from the bad stuff" and "making the web a more useful reference resource for all" (O'Neill, 2007).

Users perceive the Web as a more personal space to share content and thoughts and connect to others with similar interests. Peer-influence occurs within social networks both online and offline. For example, a video can be shared between friends on a Facebook wall or played in front of group at a party. In both instances, the exposure to that UGC can generate more interest due to the appeal to peers, and in turn influence viewers to share the video again with others.

UGC creators and modders support the development of mods and add-ons, as well as each other, through the use of websites and forums. For example, the WoW forum site hosts a specific forum page for UI and macro advice. On this forum, players can discuss the creation of macros and UI mods in order to obtain feedback from other players. It is also interesting to note that these forums experience less flaming (the practice of insulting others) than others. There are also forums available that are not hosted by Blizzard. It is considered good practice to solicit feedback from others when creating, or looking for a mod or add-on. Because mods have uncertain provenance, it is not always easy to find practice guides. Thus, the mod community is a major resource for players wishing to create mods and add-ons.

There are also sets of unspoken rules, created by the community, regarding ownership of mods. Generally, there is one owner per mod (Know & Nard, 2010b). If a modder elects to abandon or cease working on their mod, another modder may volunteer to become the new owner after a certain amount of time has passed (Know & Nard, 2010a; 2010b). It is important to note that this period of time is significantly shorter than the legal copyright period (Know & Nard, 2010a). Modders also want control of the distribution of their mods, so they can monitor user questions and track bugs (Know & Nard, 2010a). It is considered best practice to make mods available through free distribution sites such as Curse.com and Wow Interface. These sites allow players to download mods for free, and are seen as a safe place for downloading by the community. It is against Blizzard Entertainment policy to sell mods or add-ons for WoW.

As with video games, SL users often turn to others in the community for assistance in creating content. There are a number of websites (including Linden Lab's SL webpage) that provide information on creating content for the world, as well as

several published books. Residents have even created content within the game to assist others with the content creation (White, 2008).

By providing free access to data sets and development tools, open data and open access projects provide the resources for users to create innovative tools and applications that can be used by content creators for a range of uses. For example, open platforms that allow any user to create a virtual world (Burri-Nenova, 2009), and clear policy instructing government agencies to provide and maintain data sets, such as the Obama administration's Open Government Directive, support the development of user-generated apps (Orszag, 2009). Numerous governments, both national and subnational, have adopted policies that endorse the use of OSS. Lewis (2010) identifies over 360 such policies, particularly in Europe and Asia. From May 2005 to March 2006, the British government sponsored an initiative called the Open Source Academy (www.opensourceacademy.org.uk) that encouraged the use of OSS. However, funding for the Academy is now frozen (Kettel, 2008). The United Kingdom's *Connecting the UK: The Digital Strategy* aims to make the UK a leader in digital content, including that produced by users, by reducing barriers to content production and distribution (2005). Content forms one of the four main pillars of New Zealand's digital strategy, and users play a central role. The government is committed to providing government information to citizens, adopting open source software and creating digital repositories for UGC (New Zealand, 2008).

Social norms are present in each domain of user-generated content as a form of best practice. Users themselves determine acceptable behaviour in these environments. For example, game and virtual world mods are governed in part through informal modder norms (Burri-Nenova, 2009). The community also establishes unspoken rules regarding ownership of mods. Generally, there is one owner per mod (Kow & Nardi, 2010b), and if a modder elects to abandon or cease working on their mod, another modder may volunteer to become the new owner after a certain amount of time has passed (Kow & Nardi, 2010a; 2010b). The problem of UGC quality has itself been crowdsourced in some instances. Social media have also been mobilized to identify quality in the highly variable world of user-generated content (Agichtein et al., 2008).

3.0 Content Distribution, Quality Control, and Value Creation

3.1 Aggregation, Distribution and Access

User-generated content cannot be leveraged until and unless it is collected, organized, and indexed in order that others can access it. In fact, as Chris Anderson (former editor of Wired Magazine) notes in his blog, "content is only as valuable as your ability to find it" (Anderson, 2007). Anderson penned this comment in 2007 in his analysis of a Bear Stearns report on user-generated content in the entertainment industry. In their report, Bear Stearns (2006) highlight the importance of content packagers that mediate between content consumers and the virtually infinite amount of content available as user-generated productions. According to Bear Stearns (2006), the value in user-generated content lies in this aggregation and distribution role, and they cite examples such as YouTube as instances of successful aggregation and distribution models. The need for aggregation and distribution is acute across the range of user-generated content, precisely because the content creators are typically individuals or small groups working outside of a traditional corporate structure.

Successful distribution sites create an online presence, successfully integrating content creation, aggregation, distribution, and consumption functionality into one tool. Although many of these sites exist specifically and solely as universal distributors of specific content forms (e.g., Flickr is a repository for images), other models exist. Amazon, for example, integrates user-generated content into its commercial sales website. Citizen journalism sites, including sites such as such as 360News, Allvoice, WikiNews, and MyNews: CTV.ca aggregate multiple forms of user-generated news productions, offering another avenue to connect consumers to user-generated content. Citizen journalism allows people without professional journalistic training to "use the tools of modern technology and the global distribution of the Internet to create, augment or fact-check media on their own or in collaboration with others" (Glaser, 2006).

Effective aggregation and distribution sites are easy to access, easy to navigate and use, easy to find content of value on, and easy to find again. Many forms of these sites exist. Discussion boards, forums, sites that review services or products, and some sites and blogs offer the ability to post comments and other small contributions; Amazon, for example, aggregates and organizes user-contributed book reviews, and iTunes

provides the same functions for music reviews provided by users. YouTube, Wikipedia, Craigslist, Twitter, Wordpress, and Flickr are among the top websites for user-generated creative content including text, images, and video (eBizMBA, 2010). There are many sites that host multiple blogs, often for free (e.g., Open Diary, Live Journal, Blogger.com Wordpress, TypePad, and Squarespace), providing a centralized source for this type of content, and Google Blog allows online searchers to simultaneously search every blog that publishes an RSS or Atom site feed. Microblogging (short blog postings, often 140 characters or less) are another popular form of UGC, and aggregators/distributor sites for this type of content include Twitter, Jaiku, Pownce, Posterous, Tumblr, and FriendFeed.

YouTube has emerged as the primary distributor of online video content. Acquired by Google in 2006, YouTube is the second-most searched site in the world and the world's largest user-generated content video-on-demand (VoD) system (Perez, 2010). In the month of May, 2010 alone, YouTube reached an all-time high of 14.6 billion videos viewed (Flosi, 2010). YouTube serves over 100 million distinct videos daily, growing with over 65,000 new uploads per day (Cha et al., 2009; Pingdom.com, 2010). Similar distribution platforms are being created for auditory content: (MixCloud - www.mixcloud.com and SoundCloud - soundcloud.com). MixCloud and SoundCloud are two sites developed within the last five years that distribute audio content including radio, DJ mixes, and podcasts. While upload statistics are not available for either site, they are in competition to be the 'YouTube of audio', and both host significant and growing amounts of audio content. A large number of photo sharing sites, such as Webshots, SmugMug, Flickr, Photobucket, and Picasa, now share similar features and many have accompanying applications for mobile devices.

Many aggregation/distribution sites, and particularly those that distribute creative content, have a mobile device app that allows access to personal and public user-generated content. For example, Facebook and Twitter apps are readily available for mobile phones, and highly utilized. In some cases sites have multiple mobile and desktop applications from third party developers that offer different functionality to suit end users. Providing multiple points of access allows increase use in the software and more opportunity to contribute content. Although this is less important in some areas (e.g., game mods where users want access only when inside the game environment or open

source software where access is only infrequent and limited to program use), multiple points of access will be of crucial importance with respect to creative content.

Many aggregation and distribution sites remain focused specifically on content management. Increasingly, however, aggregation sites are incorporating social networking functions (e.g., YouTube, Flickr), and social networking sites are serving as avenues for content aggregation and distribution (e.g., Facebook). Social networking sites are now widely used for sharing user-generated content (Khanra & Biswas, 2010), providing functionality to upload content directly into the site itself, eliminating the need for formatting and conversion, and allowing instant distribution to a group of contacts within one's social network, or access by the wider public (if permissions allow). The lines between straight repositories and social media sites are blurring (Sobel, 2010). The desire to share albums with family and friends has led photo sharing websites to add functionality such as ability to comment, change privacy settings, include a select network of contacts, and add tags to categorize photos (Reagan, 2008; Van House, 2007). Podcasting has likewise shifted into the social media arena with the result that podcasting is now "generally seen as a part of a channel strategy – a valid part of a multi-platform digital buy" (Webster, 2010).

Aggregation and distribution sites exist for other forms of UGC, and are equally critically in providing access to these forms. These sites are less numerous than the sites devoted to the organization and distribution of creative content, perhaps reflecting the fact that relatively less of these other types of content are produced, or perhaps reflecting the different conditions of production and distributions, since some other forms of UGC are produced within the context of a pre-existing platform and distributed in conjunction with that platform. The App Bank aggregates and distributes social content and games for uploading to social networks (www.appbank.com); in addition to being an aggregator of this type of content, the site offers produces the opportunity to generate revenue from their games and apps. SourceForge (sourceforge.net) provides a similar platform for Open Source Software, identifying itself as "your location to download and develop free open source software", with 2.7 million developers, 260,000 projects, and more than 46 million consumers of open source software content (SourceForge, 2010). Game mods are aggregated and distributed on specialized websites (e.g., www.curse.com or www.wowinterface.com). Some sites of this nature are owned and controlled by the

platform manufacturers, such as PlayStation or XBox (PlayStation Network: www.PlayStation.ca; Xbox Live: www.xbox.com/en-ca/live).

Creators of Android apps can load their creation onto the Android Market for distribution. Developers must pay a fee of $25, and agree to the Android distribution agreement. Developers can then put their applications on the market, to be downloaded by users for free, or for a fee. Distribution of iPhone apps is more closely controlled: these apps are available through the App Store, which is controlled by Apple. Each app must undergo an extensive approval process before it may be made available on the App Store. Innocentive (www2.innocentive.com) is an interesting site that turns aggregation 'on its head': instead of aggregating UGC for consumer access, it aggregates problems that could benefit from UGC. Companies post scientific challenges on the site, inviting anyone in the Innocentive 'community' to identify solutions, paying between $10,000 and $100,000 to the successful solver.

Several different business models have emerged to allow OSS production and distribution by organizations. Through OSS is often distributed without cost, organizations can offer technical support and service for the software (Weber, 2004). This model is used by Redhat.com which provides support and service for Linux (Weber, 2004). Some firms bundle OSS with proprietary software (Dahlander & Magnusson, 2006). OSS has even made inroads in enterprise software packages (software such as customer relationship management (CRM) or enterprise resource planning (ERP), which have traditionally been provided exclusively by large corporations. By keeping development and marketing costs to a minimum, open source enterprise software providers focus on providing value added services such as technical support and customization (Tapscott & Williams, 2008). Open source products may also be given away by producers for the purposes of generating demand or eroding the position of an established market leader (Weber, 2004). Organizations adopt OSS because it can lower overhead, be applied to a greater range of platforms than proprietary software and often excels in term of technical performance (Maher, 2000). The biggest barrier to the adoption of open source software by firms is liability concerns. With commercial software the vendor is liable for the performance of their product, but in the case of OSS, the absence of a clearly identifiable party that would be liable disincentivizes OSS adoption (Lerner & Tirole, 2002).

3.2 Quality and Content Control

Quality and content control are significant concerns with UGC. It is widely recognized and accepted that the production values of much user-generated content (e.g., videos) are unlikely to match professional standards, but this is not tantamount to saying that quality is irrelevant: consumers want access to high quality UGC. Content is an even more significant issue, since open repositories allow for the upload of all types of content, including that which some consumers might find offensive and which might even be illegal, at least in some jurisdictions. Platform providers of games, virtual worlds, or dedicated hardware (e.g., iPhones) have a vested interest in ensuring that mods or apps (effectively seamlessly integrated) reflect well on the platform and enhance, rather than detract from, the platform value. As a result, they too have an interest in ensure the UGC is of high quality and appropriate content. Collaborative productions also face quality and content concerns, since the collaborative project is the joint result of multiple contributions from multiple contributors. They also face a related issue of version control that is *not* relevant to other forms of UGC, resulting in the requirement for another layer of content management.

In some cases, more formalized agreements or contracts serve to enforce quality and content control. Thus, many game and virtual world mods are governed through the private law contracts that users agree to before entering the game space (Burri-Nenova, 2009). In some cases, user agreements explicitly prevent UGC. The first use of legal tactics to prevent UGC was utilized by 20th Century Fox. In 1997, a team of unpaid programmers were developing *Alien Quake*, a planned mod of the game *Quake* in which the original game environments and monsters would be replaced by those from the *Alien* movie franchise. 20th Century Fox demanded complete destruction of this work because of the use of the *Alien* brand. (Baldrica, 2007). The term "foxed" arose out of this case, and is now used to refer to when modders are limited in their creation by heavy-handed tactics from large companies (Baldrica, 2007).

Second Life (SL) is unique in terms of governance, as users retain intellectual property rights over their creations according to the Terms of Service (TOS) (Halbert, 2009). Creators of mods in SL can mark their items as "no copy," "no mod," and "no trans", ensuring other residents cannot copy, modify, or transfer their creations to another

without express permission if they so choose (Lo, 2008). However, the TOS does provide Linden Lab, the company that created and maintains SL, the right to use, reproduce, and delete content as they see fit, thus undermining the rights they have given residents (Halbert, 2009).

App developers face similar licensing agreements or other legal controls. Those creating data mashups may face restrictions with respect to access to and use of the data. The National Research Council's GeoGratis website provides citizens data at no cost and with minimal restrictions. Users must register and adhere to the terms of a licensing agreement. To maximize the value of the data to users, the GeoGratis license grants users a royalty free license to exercise all the intellectual property rights in the data, and provides the licensee with any IP rights that result from developing derivative products based on the data (Natural Resources Canada, 2009). Toronto, Vancouver, Edmonton and Ottawa have recently agreed to an Open Data Framework which aims at enhancing the standards and terms of use to which the data is subject (City of Toronto, 2010).

On some cases, notably the iPhone, the distribution platform is controlled by the hardware or software creator. This allows centralized control of quality and content, and thus control over the product reputation as influenced by apps. The approval process for iPhone apps is complex. Apple requires that all apps be reviewed before they can be released to the app store, however, the documents on the process are not available for public consumption. It has been recommended by some authors that users test their app thoroughly before submitting it to the approval process (Wooldridge & Schneider, 2010). If approval is not obtained, developers are welcome to modify and resubmit (Wooldridge & Schneider, 2010).

3.3 Value Creation

User creation of apps and mods for pre-existing infrastructures requires the negotiation of numerous and potentially competing interests. In many cases, the very creation of successful app or mod is personally satisfying because it enhances game play or mobile device use. The creators of the infrastructure are concerned with maintaining a certain quality and scope of offerings so might wish to retain the right to refuse some apps. These multiple interests are reflected in the wide variety of mechanisms that facilitate and constrain the creation of apps and mods.

Users who create content have a complex array of motivations for doing so. Many of these motivations are non-monetary in nature. Many UGC creators enjoy the experience of creating content, and 'fun' is in many cases a strong motivation for UGC creation (Nov, 2007; Stoeckl, Rohrmeier & Hess, 2007). Social capital is another important motivation for UGC creation. While developers of modifications for games and virtual worlds are generally not paid, they are able to earn skills or acquire recognition. For example, modders gain game development knowledge, skills for how and when to apply that knowledge, status among their peers, community recognition, and social capital within the community. Modders do not mind the marginalization of not having an official position within the game company provided that they have at least a slim chance of influencing the game (Milner, 2009). This arises out of the fact that most modders are also fans of the game, and eager to contribute to its success. Posters to social network sites may realize social value through connecting with network members. Additionally, however, social value may be created through the establishment of a poster's reputation for a certain kind and quality of work.

Creators of UGC may also benefit from professional reputation enhancement or career promotion (Anderson, 2006). They may create and distribute UGC in order to establish a reputation within a particular domain (e.g., software development, photography). In some cases, reputation is not explicitly sought, but instead is a side effect of the content availability on aggregator sites: UGC creators may be 'discovered' by others who are browsing available content. Individual posters may also receive economic value for their work by securing contracts to post their material, or by receiving commissions after potential clients have seen freely-posted material online. Some UGC aggregator sites allow users to realize a small monetary benefit for accessed content (e.g., The App Bank); in these cases, however, it is unlikely that the direct monetary gain is much incentive, and UGC creators will also be interested in the possibility of building an online presence and reputation. A well-developed online reputation could potentially be leveraged for the economic advantage of a content creator, such as when widely followed bloggers generate income by serving ads on their sites.

In every software area there exist some OSS alternatives to proprietary software, though generally (with the exception of HTTP web servers) proprietary software dominates (Weber, 2004; Netcraft, 2010). While there are OSS projects in every field of

software, several programs have achieved significant success. Prominent OSS projects include the Linux kernel and the Linux/GNU operating system, the Apache webserver, Mozilla web browser, and the Perl programming language (Maher, 2000). While some of these software systems are now run by foundations with paid staff (such as the Mozilla Foundation that oversees the Firefox web browser, the Sendmail Consortium that runs the Sendmail email program, or the Apache Foundation which is responsible for maintaining Apache), many of the most successful OSS projects can trace their roots to student programmers (Lerner & Tirole, 2002). Though the overwhelming majority of OSS is small projects worked on by just a handful of developers, some open source software becomes widely adopted so as to rival proprietary software.

Although OS software typically does not dominate within a particular market, the Apache HTTP web server is the most successful of all OS software with a 56% market share putting it ahead of proprietary rivals including Microsoft's Internet Information Services (IIS) (Netcraft, 2010). The Linux operating system is the second most popular operating system behind Microsoft's various Windows iterations in terms of market share (Kettell, 2008). The success of Apache and Linux has resulted in IBM adopting and working to improve these open source projects in an effort to be less reliant on the proprietary products offered by Sun and Microsoft (Tapscott & Williams, 2008). The effectiveness of the open source model of software production is even recognized by the World Intellectual Property Organization (WIPO), which describes OSS as a "successful alternative" to using copyright to manage software (WIPO, 2008: 70). Though the most successful pieces of open source software have a tendency to develop and attract institutional support, OSS demonstrates a matured form of UGC that has go beyond its roots in users though still facilitates user contributions.

3.4 Markets and revenue creation

There are four main sources of revenue for UGC creators – ad revenue, voluntary donations, and direct payment/subscription fees from users, and the licensing of content to third parties (Borgne-Bachshmidt et al., 2009). Wikipedia is sustained on a relatively small operating budget through monetary donations (OECD, 2007). One example of significant value creating collaborative UGC project is Mozilla's Firefox browser. Firefox's 2006 operating revenue was over $66 million (USD), and the firm employed ninety full time employees. The Mozilla Foundation is able to generate such revenue by offering Google as its default search bar, and receiving a share of the advertising revenue generated by Google (Lih, 2009). Despite being run by a large foundation, Mozilla continues to offer ways for users to contribute including localization work, testing and quality assurance and developing add-ons (Mozilla, 2010).

Aggregation and distribution of UGC are relatively easily monetized, and this fact is widely recognized by the business community. The social networking site industry operates on two business models: subscription based and advertising revenue-based (Gangadharbatla, 2008). Photo-sharing sites generate revenue through integrated online photo finishing services and advertising (Reagan, 2008). Although it is possible that business interests in these cases could be viewed as exploiting the free labour provided by UGC content creators, it is also possible to create an aggregation and distribution environment that meets the non-monetary goals of UGC creators as identified above while creating direct monetary value for the aggregator.

In some cases, the UGC itself generates significant monetary value. *Counter-Strike,* a multiplayer game that began as modification for the game Half-Life, is considered the most successful mod in the history of computer games: it was created by Minh Le (a Canadian student at Simon Fraser University) and Jesse Cliffe (Kücklich, 2005). It was later bought by Valve Software and subsequently sold as a standalone product for the XBox and PC (Kücklich, 2005). *Counter-Strike* has also been a source for other mods, such as Velvet-Strike, a collection of spray paints to use as graffiti on the Counter-Strike environment (Schleiner, 2002).

In Second Life (SL) user-generated content is frequently used to generate wealth, whether it be in Linden dollars or USD. Transactions in 2010 have already reached 160 million USD (Nino, 2010). Users may sell clothing, buildings, or other objects.

Residents of SL are able to duplicate their products at no cost, which means they are able to enjoy little marginal production and immediate economies of sale, if they choose to sell their creations to the SL community (Huffaker, Simmons, Bakshy & Adamic, 2010). However, users must be aware that while they retain intellectual property rights over this content, Linden Lab may remove the user's content, or the SL service, at any time.

Some collaborative UGC projects have gone on to spawn small but successful organizations. Wikipedia, for example, rivals major corporations such as Google, Microsoft and Yahoo as a web destination but doing so on a small operating budget and with only a handful of paid employees (Lih, 2009: 4). UGC offers several other areas for the creation of value. UGC platforms may also be able to generate revenue by physical copies of related goods (OECD, 2007). Taxing authorities around the world are also investigating virtual worlds as a potential source of tax revenue (OECD, 2007). However, potential tax increases may dull user's interests in creating UGC.

Internet service providers (ISPs) benefit from increased demand for Internet access required to both create and consumer UGC (OECD, 2007). The popularity of UGC on mobile based platforms such as cellphones increases the likelihood of significant revenue for mobile service providers (Borgne-Bachshmidt et al, 2009). The use of UGC may also be leveraged to create a brand value (OECD, 2007). While UGC creators are typically not directly remunerated for their contributions, some UGC platforms are experimenting with methods to provide creators a share of the value generated from their content (Borgne-Bachsmidt et al., 2009).

Collaboratively authored open source software can be marketed as a consumer or business product. Even when such software is given away for free, its creators may be able to provide support and service for a fee (Maher, 2000). Technical support provides a greater share of the software industry's revenues than the sale of software itself (Benkler, 2002). OSS projects typically lack documentation, but this creates a complimentary market for private firms (Maxwell, 2006; Lerner & Tirole, 2000).

4.0 Barriers to UGC

4.1 Technological infrastructure and capacity

The primary technology required to support UGC is broadband internet access. Access alone is not sufficient, as UGC is only possible when the cost of such broadband is affordable given the large amount of uploading and downloading that may be done by UGC creators (OECD, 2007). In addition to affordable and reliable access to the Internet, the development of UGC is dependent on access to appropriate hardware, software, and technical knowledge.

All collaborative UGC requires some basic level of technological literacy. While younger individuals are likely to readily possess the skills required for UGC production, governments may have to provide targeted programs to older generations, the disabled and those from lower income brackets (OECD, 2007). Creating supportive learning environments and developing interfaces that are simplified for users and learners may help with closing this gap (Karahasanovic et al., 2009). While a growing number of users are aware of the risks involved in providing personal information (Lenhart et al., 2007; Fisher, 2010), even experienced content creators may need to keep abreast of the shifting world of privacy settings (O'Neill, 2010).

The creation of applications requires a greater knowledge of computer programming; however, contributing to an open source project is also a skills developing endeavor (Maxwell, 2006). UGC contributes to skills development in younger age groups who can then mobilize such skills later on as they begin and advance in their professional careers (OECD, 2007). Creators of UGC are often able to use the skills and social capital they develop working voluntarily to gain future commercial employment (Lerner & Tirole, 2002; Bernardo, 2007; Banks & Potts, 2010).

4.2 Ownership and control

Proprietary platforms, digital rights management, and licensing

Closed development systems, proprietary formats, licensing and approval systems create challenges for UGC developers (Wooldridge & Schneider, 2010). For instance, Apple's unwavering stance against Flash (Jobs, 2010) has been a thorn in many Flash

based developers' sides, and one of the many examples of closed development environments that prevent the unification of the mobile experience (Balsillie, 2010).

Private ordering mechanisms can be a significant barrier to UGC creation and distribution. Private ordering techniques can be either technological, such as Technological Protection Mechanisms (TPMs) including Digital Rights Management (DRM) software, or legal devices such as licensing agreements (and End User Licensing Agreements (EULA) specifically.) Unlike statutory intellectual property laws, which are public ordering mechanisms under the jurisdiction of the federal government, private ordering mechanisms provide private groups and individuals a broad range of ability to stipulate the terms under which intellectual content can be used. Very often these terms limit the ability of end users to engage in the full range of lawful activities that they are otherwise entitled to practice. While copyright does allow the licensing of content to users, profit maximizing firms are likely to only limit such licensing to commercial opportunities where pecuniary returns can be maximized (Elkin-Koren, 2005). In addition to contractual terms, DRM can be used to restrict uses of copyrighted material preventing creators from accessing and using material that would be covered by fair dealing exceptions to copyright (OECD, 2007; Craig, 2010; Lessig, 2001).

The use of differing licensing schemes may create a situation where content from one site may not be posted on another. For example, the GNU Free Documentation License (GFDL) restricts content use to those using the same license (Elkin-Koren, 2005), The result is that, for example, content from Wikipedia cannot be added to Wikitravel, which uses a Creative Commons Share Alike license, and content from Citizendium, which uses the Creative Commons Attribution Share Alike License, cannot be used on Wikipedia (Lih, 2009).

While contracts have the potential to limit UGC production, it has been noted some private ordering is necessary to allow the flourishing of collaborative UGC (Elkin-Koren, 2005). OSS creators have also made extensive used of licenses; they are used to allow access to the work, but prevent others from converting it to a proprietary product (Free Software Foundation, 2010). But in the same way that TPMs and DRM can both encourage and inhibit UGC production, licenses and contracts can restrict UGC creators, but are also central to facilitating the distribution of user-generated content. For example,

the NRC GeoGratis licenses will facilitate innovation as it allows individuals to obtain the IP rights on the tools and applications they develop (Natural Resources Canada, 2009.

Copyright and Patent Laws

Copyright has a significant impact on UGC production and distribution. It is important to note that many distribution platforms are located outside of Canada so operate under the laws of their host countries. In the case of original works, UGC creators are automatically given copyright, which in Canada consists of a bundle of rights including the right to reproduce and make derivative works and subsists for the life of the authors plus an additional 50 years after their death. In order to distribute the content through various UGC platforms creators often have to license their content to site and retain the copyright, though in some cases creators do have to assign their copyrights to the platform (OECD, 2007).

In Canada, software is protected by copyright as a literary work as is much of the content of wikis. Because the *Copyright Act* gives copyright owners the exclusive right to produce, reproduce, publish and transform a copyrighted work, UGC creators must ensure that material taken from an existing work is licensed or such use is within the scope of a limitations or exception such as fair dealing. If UGC is created from source material where IP rights are held by a large organization, the cost of litigation or even the potential of litigation creates a chilling effect and acts as a major deterrent to UGC production and distribution (Merges, 2007). Burri-Nenova (2009) argues that some video games are designed through code and contract as complete "walled gardens," rendering them immune to fair use exemptions. Given the judicial expansion of Canadian fair dealing in recent years (Murray & Trosow, 2007) the "walled-garden" analogy is an over-simplification, but much uncertainty about the scope of fair dealing remains, and this uncertainty is a material barrier in the further use and production of UGC which needs to be addressed.

In 2004, a unanimous Supreme Court of Canada said that

> …the fair dealing exception is perhaps more properly understood as an integral part of the Act than simply a defence. Any act falling within the fair dealing exception will not be an infringement of copyright. The fair dealing exception, like other exceptions in the Act, is a user's right. In order to maintain the proper

> balance between the rights of a copyright owner and users' interests, it must not be interpreted restrictively (*CCH v Law Society*, 2004, at paragraph 48).

The policy of this important Supreme Court decision needs to be better incorporated in the *Copyright Act* itself, because of all of the uncertainty that has been generated in the current environment about the scope of fair dealing. The government has recognized this by proposing the expansion of the fair dealing categories to include education, parody and satire as well as by proposing the new UGC protections in Bill C-32 (2010).

Open source software is also more susceptible to claims of copyright infringement. Because the source code is readily available for inspection, it is easier for rightholders of proprietary code to scrutinize OSS products for potentially infringing code (Zittrain, 2004). Providing copyright protection for software also complicates the traditional idea-expression dichotomy in copyright. Under copyright law ideas are not protected, but their specific expressions are (e.g. the character of Robin Hood is an idea and not protected, but a specific book or film containing a Robin Hood character is an expression and protectable). In the case of software it is often difficult to separate the idea from its expression, and this problem is further complicated when source code is not made available to reveal the expression of the idea embodied in the software (Weber, 2004).

With respect to mashups, copyright can form a major barrier to UGC distribution. When copyright protected material is used in mashups or remixes, UGC creators must either have a license to use such content, or the usage must be covered by an exception in copyright law. The fair dealing exceptions in Canadian copyright law allow the use of copyrighted material for private study, research, criticism, review and news-reporting, but the scope and reach of fair dealing remains subject to uncertainty and disagreement. In cases where UGC is created from a large number of source materials there can be significant transactions costs involved in determining, contacting and negotiating with the rightsholder (Elkin-Koren, 2005). In 2009 the National Portrait Gallery in the United Kingdom threatened to sue Wikipedia for copyright infringement for images found on the site, resulting in the quick removal of those images from Wikipedia (Chacksfield, 2009). Though Bill C-32, the current copyright reform bill now pending in Parliament, would add education, parody and satire as new categories of potential fair dealing and would

also create a specific UGC exception, current copyright law acts as a barrier to many forms of UGC production and distribution.

In addition to being protected by copyright, a recent Federal Court decision introduces the possibility that the functions of software may be patentable. In *Amazon.com v. Canada* the court ruled that there is no exception in Canada excluding business methods from patentability (*Amazon.com v. Canada, 2010*). The inclusion of business methods within the scope of patentable subject matter allows the functions of software to be patented, creating an additional layer of intellectual property protection. This layering of IP protections on software is likely to impede user innovation (Heller, 2008; Shapiro, 2000). The increasing aggregation of patents by non-practicing entities, firms that hold patents not to produce the underlying technology but for holding the patent as an asset that can be used in litigation, presents further problems for open source programmers (Maxwell, 2006; Kahin, 2007). The possibility that open source software products may be found to violate patents limits their appeal to organizations (Huysman et al., 2008). Several authors examining the introduction of business methods patents in the United States have highlighted that many of these patents are of low quality (Hall, 2003; Burk & Lemley, 2002; Jaffe & Lerner, 2006). The protection of software through both copyright and business methods patents presents a serious barrier to OSS production.

5.0 Conclusion: Policy Implications and Further Research

Much of the value that users currently realize (and indeed seek to realize) from UGC does not take the form of monetary compensation. Users are also interested in opportunities for creative expression and feedback, development of personal and business social relationships, reputation development, and contribution to the public good. Government needs to pay attention to these aspects of value in the creation of Canada's digital content advantage. We should be focusing on the construction of effective platforms for the creation, organization and distribution of user-generated content. Both public and private institutions could have a role in creating value-added platforms, and are already moving in this direction. At the same time, policy makers must use caution in avoiding new policies, which will extend the scope and reach of copyright and patent laws in ways that may inhibit the development of creative and innovative content.

5.1 Policy implications

A forward thinking policy framework will require the balancing of several factors which will take into account the changing nature and context of the digital environment. Copyright and licensing laws that facilitate the creation and protection of UGC must also allow the production of UGC from other source material. The ability to access, utilize, re-purpose and distribute existing source materials in a transformative manner is a fundamental pre-requisite to optimal creation and use of UGC. The policy framework must also ensure users' privacy (and anonymity if desired) in creating and posting collaborative UGC, but also sufficient mechanisms to determine authorship in some specific circumstances.

Policy guidelines for digital content can be found in the OECD's *OECD Policy Guidance for Digital Content* (2008). In considering how to mobilize UGC, the OECD recommends creating an enabling environment by creating, "policies that encourage a creative environment that stimulates market and non-market digital content creation, dissemination, and preservation of all kinds" (OECD, 2008: 3). In crafting UGC policy the two central principles should be a balancing of interests and creating an enabling environment.

One of the most important aspects of the policy framework governing UGC is intellectual property law. While creators require some sort of reward or recognition for

their activity, it is not necessary to provide them the full social value of their work (Ghosh, 2007). The proposed extension of the categories of fair dealing to include education, parody and satire, as well as the proposed user-generated content exception in Bill C-32 (An Act to Amend the Copyright Act) represents important steps in creating the legal environment that may facilitate the flourishing of UGC in Canada. At the same time, provisions in the Bill with respect to technological protections measures need to be carefully tempered in order to insure that digital locks do not create unreasonable barriers to the access and use of content which is otherwise lawful and beneficial.

While the noncommercial UGC exception would facilitate increased UGC production, it may not necessarily enable distribution through platforms that generate advertising revenue such as YouTube (Gervais, 2010). Rather than limit the scope of the new exception with respect to the commercial/non-commercial dichotomy, which we have seen is very porous, it would be better to focus on the level of transformativity involved in the particular use. Furthermore, the provisions contained in Bill C-32 with respect to technological protection measures will encumber UGC production. In its current form, the bill encourages content owners to lock-down their content with TPMs, rendered the fair-dealing and UGC amendments ineffectual.

The OECD Council on Broadband Development recommends balancing both user and supplier rights with respect to DRM (OECD, 2004; OECD, 2007). This sentiment is echoed by Merges who argues that the law's goal should be to balance the claims of both creators and remixers (2007). While intellectual property plays an important role in encouraging original intellectual endeavors, overprotection of these works will lead to a decrease in follow-on works that use original works a source material and this problem is particularly acute in the emerging area of UGC. A well balanced UGC policy will enable individuals to use and transform content ensuring an increased quantity of creative works by users and greater exposure and recognition for creators of the underlying material.

A second major aspect of intellectual property law that raises concern is the recent Federal Court decision to allow some business method patents. While software itself is not patentable, the extension of patent law to cover business methods implicates that some functions of software will become patentable. The software industry has a long record of innovation before the use of patents (Hunt, 2001). While patents do play an important role in encouraging innovation in industries where the outcomes of research are

discrete products, in cumulative research areas strong patent protection presents a less convincing case and may impede innovation (Hall, 2003; Jaffe & Lerner, 2006; Bessen & Maskin, 2000). In the case of software specifically, there is no clear evidence that patents are necessary (Bessen & Hunt, 2004; Hall, 2003). Given the innovative history of the software industry before patent (and copyright) protection, the government must be careful not to dampen growth in this innovative and important sector of the economy.

Other issues that require attention are the effects of the private ordering mechanisms such as provided by licensing and TPMs, as these mechanisms may also play a restrictive role. DRM that limit access to creative works where such access would normally be permitted under fair dealing or other statutory exemptions present a considerable barrier to UGC production and distribution (OECD, 2007), which is why the digital locks provisions of Bill C-32 are so problematic as they are now drafted.

Another important policy consideration for UGC is privacy. Individuals need to be able to contribute anonymously, but at the same time it is necessary to ensure that content contributors can be identified for purposes of legal liability. If individuals' personal information is made to easily available through UGC platforms there exists an increased potential for identity theft (OECD, 2007). The recent Supreme Court decision in *Grant v. Torstar Corp* affirmed that liability for defamation extends to social media (*Grant v. Torstar Corp.*, 2009). Thus, the Personal Information Protection and Electronics Document Act (PIPEDA) must ensure that individuals will have the their privacy protected while at the same time there needs to be means of the identification of contributors to collaborative UGC products in cases such as defamation on a wiki or copyright infringement involving OSS.

Through a careful, thoughtful and purposeful balancing of the various policy levers, Canada can create a flourishing UGC environment. By enabling its populace, Canada will not only create a vibrant and innovative UGC sector, but also facilitate greater cultural expression and economic growth.

5.2 Directions for Further Research

This study has outlined the current state of knowledge in terms of UGC in Canada and around the world, as well as a number of challenges for, and gaps in, the current

literature. We have identified a number of future directions for Canadian researchers. Following is an initial listing of potential issues for further research:

With respect to the motivations of creators and users of UGC:

- Why do people create content and post it online?
- Do different types of platforms affect the motivation behind UGC? To what extent do emerging technologies (such as smart phones, tablets, and other mobile devices) offer new interfaces that will facilitate the generation of content and putting it online?
- What is the role of social interaction as a driver in the success of certain models? Do people consume and generate UGC as a personal investment?
- How do end-users find or become exposed to user-generated content and to what extent does the type of platform or technology affect the frequency of access?
- To what purposes are people utilizing UGC (i.e., for work research, professional development, leisure, entertainment, personal development)?
- What makes a particular piece of user-generated content popular? (How does something go viral?)

With respect to the provision of library and information services geared to the needs of users and creators of UGC:

- How can library services better reflect the changing nature of how the population is utilizing digital content?
- What sort of bibliographic, search and information retrieval tools need to be developed?
- To what extent should public libraries undertake to act as a resources for patrons interested in developing UGC, what demands would these services place on institutional resources, and how could these be supported?

With respect to information resources that are held by governments and other public agencies:

- How can government held data sets be leveraged to increase citizen participation and engagement?
- How could the current system of Crown Copyright be reformed to enhance access to government documents and publications?

With respect to collaborative content:

- Why have OSS and wikis emerged as the most successful forms of collaborative UGC, and are there other collaborative forms of UGC that have failed?
- What insights from the literature on the use of wikis in business and educational setting can be used to further understanding of UGC wikis?
- Do government policies requiring the use of open source stimulate domestic OSS production?

With respect to mobile applications:

- What is the role of user-generated content, what types of mobile applications are being created by users, and for what platforms?
- What are the best ways to make the creation, aggregation, and distribution of mobile applications more accessible to the public?

With respect to the use and development of small scale tools:

- What is the current status of Canadian small scale tools, and to what extent can access to such tools and the skills necessary to develop and use them be better distributed to the Canadian population?
- How can Canada encourage Canadian game companies to incorporate the potential for UGC into their products?

With respect to intellectual property and other policy issues:

- How can laws of intellectual property and copyright be better constructed to include digital items and virtual goods?
- To what degree would the recognition of business method patents promote or deter innovation in the area of user generated content as well as in the development of small scale tools?
- How might the use of Technological Protection Measures and Digital Rights Management systems inhibit the ability of end-users to utilize existing and create new UGC?
- What is the role of general fair-dealing and other more specific users' rights in assuring a proper balance between the interests of content owners and those of users and creators of UGC?
- How can the tension between the enforcement of intellectual property rights and the protection of personal property best be understood and resolved in the digital environment?

- How can public policies best identify and resolve existing and emerging digital divide issues?

There are many questions to be explored and answered by researchers. The topic of UGC encompasses multiple issues and it is essential that inquiry continue in this area to further explore its value. It is clear that further research is needed in order to better understand UGC, as well as to ensure Canada's digital content advantage.

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