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CAN CREATIVE FIRMS THRIVE WITHOUT COPYRIGHT? VALUE GENERATION AND CAPTURE FROM PRIVATE-COLLECTIVE INNOVATION

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Abstract:
Accounts of the 'copyright industries' in national reports suggest that strong intellectual property rights support creative firms. However, mounting evidence from sectors such as video game production and 3D printing indicate that business models based on open IP can also be profitable. This study investigates the relationship between IP protection and value capture for creative industry firms engaged in collective/open innovation activities. A sample of 22 businesses interviewed in this study did not require exclusive ownership of creative materials, instead employing a range of strategies to compete and capture value. Benefits for some firms resemble those for participants in private-collective innovation (PCI), originally observed in open source software development (von Hippel, von Krogh, 2003). Advantages of PCI include the ability to commercialize user improvements and a reduction in transaction costs related to seeking and obtaining permission to innovate upon existing ideas. Some creative firms in this study were able to generate and capture value from PCI in two directions, upstream and downstream. These dynamics offer a mechanism to understand and articulate the value of openness for creative industries policy and management of creative organizations.

Keywords: private-collective innovation, copyright, creative industries, appropriability, business models

1. INTRODUCTION

Widespread practices of sharing and follow-on innovation have introduced new management concerns for creative firms (Bechtold et al, 2015; Boudreau & Lakhani, 2015). As creative firms seek to engage audiences by making it possible to digitally re-shape and share content, they risk losing control over intellectual property assets they own (Jenkins et al, 2013). An unanswered question in creative industries management research relates to the strategic conditions under which firms should adopt 'open' approaches to developing and marketing products. Mounting anecdotal evidence suggests that however beneficial the exclusive rights provided by intellectual property law, certain firms have found it possible to limit reliance on protections such as copyright, raising the question how such creativity is sustained: *e pur si muove* (Boyle, 2003). Various forms of openness include Microsoft's 'fan' license for video games, which permits derivative re-use of video game content by its users and the open hardware-licensed Prusa i3 consumer 3D printer which innovates upon the collective RepRap hardware project and is fully openly licensed, including for use by commercial competitors.

Since the protection offered by copyright is considered a necessary for subsequent investment – being directly implied in the policy definition of 'copyright industries' – the ability to sustainably generate and capture value from public domain inputs is a puzzling feature of the digital economy (Alexy & Reitzig, 2013; Raasch & Herstatt, 2011). Examples of public domain inputs include the works of Shakespeare, books published by Charles Darwin, and folk songs whose origins pre-date the modern copyright framework. Anyone may use and distribute expressions residing in the public domain, including competing firms.

To understand the use of open IP by creative industry firms, this paper draws on existing research on private collective innovation (henceforth PCI), initially proposed to explain the behavior of open source software communities (Lerner & Tirole, 2000; Von Hippel & Von

Krogh, 2003). The simple but profound observation from PCI research is that open sharing will take place when the private benefits of doing so outweigh the costs (Dahlander & Magnusson, 2008; Lopez-Berzosa & Gawer, 2014; Stuermer et al, 2009). I analyze activities of a sample of creative industry firms that have successfully commercialized products residing in the 'public domain', paying attention to the costs and benefits of using freely available IP inputs for creative businesses. I adopt an activity-system perspective on firm behavior (Troxler & Wolf, 2017; Zott & Amit, 2010) which locates value generation and capture activities both within and outside of firm boundaries. I observe interesting findings on the varying impacts of *absence* of exclusive intellectual property rights on commercialization opportunities to creative firms under different conditions. Based on these findings I offer specific management and policy considerations, with emphasis on lessons for practitioners and avenues for future research.

2. LINK BETWEEN COPYRIGHT AND CREATIVE INDUSTRIES

Creative industry firms are those which generate and capture value through activities of creative human endeavor (Oakley, 2004; Schlesinger, 2009). In major national accounting exercises, such as by the Department of Culture, Media and Sport (DCMS) in the UK, the creative industries are understood to encompass the activities of advertising and marketing, architecture, crafts, design, film, television, video, radio, photography, software, publishing, museums, music and the performing arts (DCMS, 2015: 25). In both Europe and the USA, these activities are often referred to as 'copyright industries' (Manfredi et al, 2016), emphasizing the perceived importance of copyright protection for their sustainability.

The role of intellectual property in creative industries differs from other industries in several important ways. One important distinction is that copyright attracts automatically to a work once it is made in a fixed form. Unlike patent and trademark, no initial registration is necessary; copyright resides automatically with the person who first created the work. To further build upon a copyright work, any follow-on user needs to obtain permission from the copyright

owner. This involves the cost of any license as well as search costs involved in tracking down the appropriate owner(s), which can increase the cost of using copyright material (Baldia, 2013). The term of protection offered by copyright is longer than other IP rights. In Europe and the United States, copyright protection generally lasts for 70 years from the year of the creator's death. In the case of works made for hire (e.g. within a business), copyright protection in the United States currently lasts for 120 years from creation or 95 years from first publication, whichever is shorter. At the time of copyright expiry, the work then falls into the public domain.

Creative industry firms deal largely in intangible goods which may be more susceptible than physical products to information spillovers, reducing firms' ability to profit from innovation (Teece, 2010). This problem is amplified in digital media, where it can be harder to appropriate value from creative products (Hesmondhalgh, 2007; Teece, 2010). A first wave of research on the effects of digitization on the creative industries dealt primarily with the impact of unauthorized copying (piracy) on firms' ability to invest in new products (Landes & Posner, 1989; Watt, 2000). More recently, research has expanded to consider the role of digital inputs to the production process, the rise of audience participation, network effects arising from interactivity, cost savings in production and effects of competition from new market entrants (Aguiar & Waldfogel, 2015; Hearn et al, 2007). Much of the current research considers user and audience contributions to works in which a firm holds a copyright and can therefore control downstream use.

One IP management challenge involves choosing between work-for-hire (WFH) or original creative production to generate revenue (Hotho & Champion, 2011). WFH arrangements may be attractive to small firms because they represent a more stable source of revenue and can establish a firm's reputation. While this may bring in revenue in the short term, it may fail to provide creative incentives for workers and can inhibit long-term sustainability (Hesmondhalgh & Baker, 2010). Knight and Harvey (2015) characterize the challenge for creative firms as a tension between 'exploration' and 'exploitation' of innovative ideas. In her ethnographic account of

design firms, Noren (2014) finds that creative workers view WFH commissions as 'fine and good' projects, which, while carried out to sustain the commercial viability of the business, fall short of the ideal vision of creative work. Many firms engage in a hybrid model of in-licensing and original creative production, using the former to sustain activities while aiming to produce an original hit that will permit growth and greater autonomy. A third option, explored in this paper, is that firms adopt business models which take advantage of public domain inputs; that is, they build upon pre-existing material which is not protected by intellectual property right.

3. INNOVATION WITHOUT IP: PRIVATE-COLLECTIVES

Neighboring research on open source software has called into question the role of intellectual property in firms' ability to generate and capture value from innovation (Dahlander & Magnusson, 2009). Firms and individuals participating in open source report a range of benefits from engaging with 'private-collective innovation' (PCI) originating from beyond the boundaries of the firm (von Hippel & von Krogh, 2003). Incentives for engagement include cost-savings, increased speed-to-market and better information about consumers (Garriga et al, 2012). Economic theory suggests the benefits of openness could lead to a race towards openness, contradicting the traditional incentives theory of intellectual property (Harhoff et al, 2003). Since von Hippel and von Krogh's influential (2003) paper, one focus for empirical research has been to enumerate the costs and benefits to firms when engaging in PCI. A summary of research on commercialization of private-collective innovation is presented in Figure 1. Broadly, innovation activities can occur 'upstream' of a commercializing firm and 'downstream' of a firm which openly reveals its innovation.

[Figure 1 about here]

3.1 Benefits to Commercializing Upstream PCI

The benefits to commercializing an existing PCI (such as open source software) include product improvements and cost savings (Harhoff et al, 2003). A manufacturer may find that a

community of users have found a useful solution and may choose to incorporate that design into future products. Thus, one incentive to commercialize a freely revealed innovation is the promise of selling to other similarly-situated customers (Von Hippel & Von Krogh, 2003). Market knowledge may be generated by crowd participation in development of new products. Hienerth et al (2014) identify 'efficiencies of scope' in the design and testing of innovative possibilities. The authors describe how kayak manufacturer Hollowform incorporated improvements from users in the design of a new type of plastic kayak hull, an idea that was initiated among the enthusiast community. Overall, the authors find that 87% of all major innovations in whitewater kayaking from 1955 to 2014 originated from user-innovators (Hienerth et al, 2014, 18).

If an innovation is related to a product under development, the open inputs may increase speed-to-market by providing a head start to R&D. This has been a feature observed widely in the literature on adoption of open source software, where using open contributions can help a firm swiftly achieve the 'credible promise' of a prototype (Haefliger et al, 2008, 189). Even when competition is high, a firm may still be able to profit from incorporating a PCI if it enables the firm to access new markets or entice new consumers to adopt a standard (Lecocq & Demil, 2006). Finally, there may be cost savings due to the absence of licensing fees if the innovation is in the public domain.

3.2 Costs of Commercializing Upstream PCI

Even though PCI collaborations are typically free and open, commercial users may still bear costs related to exploitation. First, there may be start-up costs associated with establishing and managing a new community (Dahlander & Magnusson, 2008; Stuermer et al, 2009). On the other hand, if a firm seeks to commercialize an existing innovation that they do not control, there may be search and acquisition costs. In either case, there are likely to be knowledge capacity requirements to understand how to use the information. 'Transient incompatibility costs' may be present for adopters of a new system or standard, even when it is freely available (Lecocq &

Demil, 2009). Costs may be mitigated depending on the adaptive capacity of the commercial firm and the nature of the PCI (Raasch & Herstatt, 2011).

When collective innovations are non-excludable, commercial adopters may face increased competition. A major concern is the arrival of free-riders who similarly exploit the collective innovation (Stuermer et al, 2009; Von Hippel & Von Krogh, 2003). A firm may be deterred from commercial investment in a PCI, fearing that competition from subsequent entrants will result in future losses. Research with users and non-users of PCI has identified that some firms worry about differentiating their product from competitors when both are based on freely available innovations (Van de Vrande et al, 2009).

The intellectual property environment may introduce management costs. For example, open source software licenses may persist down into developed products and require 'share-back' of proprietary improvements. Furthermore, free and open alternatives may persist alongside closed forks, as competitors (Dahlander & Magnusson, 2008). A user community may continue to improve an open source project long after it is appropriated by the commercial user, leading to a more appealing and freely available product. For firms that commercialize, there is a legal risk of infringing a copyright belonging to an upstream user/innovator. The Principal software architect at cloud company Box has stated that he would not use open source projects without an explicit license:

> 'Simply saying "this is open source" doesn't make it so, nor does sharing your code publicly on GitHub or BitBucket automatically mean it can be used. Any code that doesn't explicitly have a license specified is considered "all rights reserved" by the author. […] [Inappropriate licensing] is a showstopper for businesses wishing to incorporate code from these projects.' (Zakas, 2015)

Gaining full understanding of the IP licensing environment is therefore a critically important for firms, as IP ownership can act as a source of costs as well as risk for commercial users of collective innovations.

3.3 Benefits to Engaging in Downstream PCI

A firm may decide to open a formerly proprietary innovation and share it with downstream user-innovators. PCI research uses the term 'revealing' to describe this action. One explanation for revealing in open source software was 'generalized reciprocity' among some communities of innovators where reciprocal relationships motivated behavior (Eckh, 1974 in Harhoff et al, 2003). Subsequent research has identified further incentives to reveal to downstream PCI communities. One proposition is that revealers will obtain private benefits tied to the future development of a project (Von Hippel & Von Krogh, 2003). Certain benefits are available only to active project contributors and not to free riders who did not actively take part in the development process. These represent a form of 'selective incentives' for project participation that arise organically and without the need for further sources of motivation which may be present (von Hippel, 2005). One empirical basis for this claim is that many successful open source platforms (such as sourceforge.net) are thin in social networking mechanisms or reciprocal relationships between contributors, suggesting the alternative importance of individual private benefits (von Hippel & von Krogh, 2003, 215).

Other incentives include reputational gains to the revealer, either within the community or the wider public. For example, a revealing firm may benefit through notoriety achieved for helping to establish a technological standard. Another motivation to contribute to PCI may include learning or knowledge acquisition through sharing of information with other contributors, a strong motivating factor observed in many open source software projects (Boudreau & Lakhani, 2009).

As described by Teece (1986) a firm's ownership of specific complementary assets can improve its ability to appropriate value from a freely shared innovation. These are assets in which increased adoption will improve the competitive position of the revealer (for example marketing or distribution channels owned by the revealer) (Harhoff et al, 2003). Network effects

may also be a factor, when the value enjoyed by an individual consumer is increased by the presence of additional users or products. For example, Lecocq and Demil (2006) describe how role playing board game manufacturer Wizards of the Coast opened its proprietary board game rules system to competing game creators. By placing portions of their IP into the public domain, the firm hoped to benefit from network effects, anticipating that competitors would contribute their private investments (new game content) to the overall catalogue of products, thus increasing benefits for everyone.

Finally, cost savings may result simply because the cost of keeping the information proprietary exceeds the benefits of doing so. For example, while copyright protection does not require registration fees, trademark and patent do carry those direct costs. Although there is no immediate fee to secure a copyright, if a firm chooses to protect their intellectual property, they must invest in legal monitoring and enforcement.

3.4 Costs of Revealing to Downstream PCI

In general, the cost of revealing an innovation is expected to be low (Von Hippel & Von Krogh, 2003). Information can usually be uploaded and shared digitally with little or no cost to the revealer. Indeed, platforms like GitHub have been established to simplify the sharing between members of open source software development projects. However, some information may be costlier to reveal. It is possible that revealed information could be in a format which is cumbersome to reproduce or transmit, such as in paper documents requiring digitization. Furthermore, proprietary information that the revealer wishes to keep secret must be disentangled from portions that are made open. Stuermer et al (2009) describe how mobile phone manufacturer Nokia incurred costs to restrict proprietary business secrets when interacting with a PCI community to develop a new Internet tablet. The company used non-disclosure agreements with key software developers to control information, but this slowed the overall development process (Stuermer et al, 2009, 182).

Revealing may also introduce competitive pressure. When revealers to PCI goods are also consumers (such as open-source business software), firms must consider the cost savings to competitors who adopt the improved innovation without R&D costs (Teece, 2010). The presence of a free innovation can also change the structure of a market, for example by lowering the barriers to entry for new competitors (Lecocq & Demil, 2009).

Another source of potential costs when revealing an innovation is the risk of liability that revealers may assume when making information available. A freely revealed innovation may contain elements of protectable IP which belong to the innovator and are hers to freely give to the public domain. But if the revealed information includes portions of IP belonging to a third party, then the revealer may be infringing those rights. Disputes have occurred over software packages which incorporate code libraries from third-party sources. A lawsuit initiated by database software company Oracle against Google in 2010 claimed infringement of its Java Application Program Interface (API) in Google's Android operating system, raising concerns for other commercial users of widely-used APIs (Samuelson & Asay, 2017). The expansion of criminal penalties for circumventing Digital Rights Management (DRM) systems further complicated copyright law in many jurisdictions (Favale, 2011; Samuelson, 2016). Legal uncertainty can impose costs for contributors to private-collective innovations due to the additional burden of establishing permissive licensing parameters to govern the project and its participants, and the future risk of IP disputes that may emerge if the ownership of rights is unclear.

4. RESEARCH METHOD: LOCATING CREATIVE FIRMS

Creative firms' use of open intellectual property has received limited attention within the overall body of research on open and collective innovation (Raasch & Herstatt, 2011). One methodological challenge is sampling from an unknown population (there is neither a list of all works in the public domain nor of firms exploiting them). To identify candidate firms for this

study, a non-random sample was constructed by searching backwards from a list of known public domain materials. The top 100 downloaded books from Project Gutenberg was used as the initial seed of public domain material. This initial list of works was augmented by consulting known works in the public collections of *The Public Domain Review*, an online archive in the UK supported by the Open Knowledge Foundation. The author and two research assistants searched for derivative commercial products based on the list of fiction and non-fiction books, and recorded the producing firms contact details when available. Product searches were performed on major content platforms: Google Play, the IOS App store, Kickstarter and YouTube, to locate digital adaptations based on the original public domain works. A total of 45 candidate firms with business addresses and contacts inside the UK was identified this way. A smaller number of firms were locatable and of those contacted, 22 agreed to be interviewed.

Many of the firms identified in the initial sample were small or micro-sized enterprises with less than 5 employees. In these cases, the owner or senior manager was interviewed. For the handful of larger firms selected, interviews were conducted with project managers who had responsibility for product development within the business (such as senior product managers or commissioning editors). All individuals were contacted initially by telephone or email and asked to participate in semi-structured interviews lasting 50-60 minutes in length. Table 1 lists the firms interviewed and their utilization of public domain input. Interviews were conducted by the author and two research assistants who were collectively trained on the interview protocol. Following initial transcription of the interviews a two-step coding approach was used, first to identify common characteristics shared between firms (business models) and in a second stage identify specific activities undertaken by firms to confront issues arising from openness.

5. FINDINGS: CHARACTERIZING BUSINESS MODELS

A firm's business model describes how it is organized to facilitate the interrelated activities of value generation and value capture. The activity-based view of firms' business models

considers activities extending beyond the walls of the organization, including among customers, suppliers and other actors (Zott & Amit, 2010). Business models are a useful analytic 'for the possibilities they give us for not only defining but also for exploring characteristic similarities and differences and the relationships between classes, as well as for developing understanding, explanation, prediction and intervention' (Baden-Fuller & Morgan 2010, p.161). The business models of creative firms in this study are of particular interest, because they relate to the challenge of capturing value from un-owned expressions in the public domain.

Firms were characterized according to the nature of their engagement with external PCI activities as well as internal activities that contributed to value creation and value capture. Typically, activities of creative firms include procurement, ideation, product generation, marketing, distribution and sales (Raasch & Herstatt, 2011). In this study, collective innovation activities beyond the boundary of individual firms were also considered. Classification of firms in this manner led to identification of three main approaches to external PCI activities: 1) non-engaged users; 2) engagers of upstream PCI; and 3) engagers of both upstream and downstream PCI. Within these overall types, firms combined a range of other internal and external activities in their business models to generate and capture value, discussed below.

5.1 Non-engaged users

Some firms used materials from the public domain but did not actively engage with outside communities when doing so. These tended to be larger, more established firms that developed products in traditional categories: animation, print publishing and theater performance. Firms often used a mixture of original, in-licensed and public domain IP depending on the specific product. Managers applied their knowledge of the market to identify opportunities and develop products to meet consumer interest. Some of these firms, such as publishing company Nosy Crow, were vertically integrated and combined activities of product development, marketing, and distribution under the same roof. Value capture focused on product sales, realized through

creative product differentiation, proprietary technology, and branding. Competition required firms to be innovative in product development and to invest in market knowledge.

Non-engaged users reported that existing knowledge of copyright licensing enabled them to spot opportunities for exploitation. Mark Ruffle of Rufflebrothers Ltd was employed as an art buyer for Oxford University Press before starting his own animation company. The founder of MyVox was a former music industry marketing employee with IP licensing expertise. MyVox produced traditional nursery rhymes whose lyrics were out of copyright, accompanied by original music and animations. The company captured value through its advertising-supported YouTube channel and paid downloadable mobile application.

Some non-engaged users bundled public domain material as a complementary good alongside proprietary technology they owned. Onilo, a manufacturer of classroom interactive whiteboards initially used public domain content as a 'placeholder' to develop and test its technology. The firm later commissioned copyright books, but found that public domain storybooks remained in high demand because educational consumers favored classic literary tales.

Non-engaged users expressed concerns about competition but not specifically linked to the public domain status of material they used. Instead, they saw imitation as an overall feature of the market, requiring constant reinvestment in new products. One respondent characterized her product strategy in the following way: 'When you find something in the public domain, at the time of your discovery it is less known as a public domain item. You use it creatively so that it becomes known. That's fine because you've moved on by the point when everyone is catching up with you.' (MyVox Songs). Most non-engaged users made significant alterations to the public domain material they used, such as adapting stories to new mediums, or adding elaborate new features. Mobile app developer Inkle produced a multiplayer, interactive version of Jules Verne's *Around the World in 80 Days*. A lead product developer reported that 'people compete on what

are essentially details of execution; we're competing on actual quality of content, which is a lot safer. […] We try to find holes in what's out there, fill them well, and then move on.'

5.2 Upstream PCI engagers

Some firms engaged actively with upstream PCI communities to generate value. These tended to be smaller, less-established firms that benefitted from the activity of PCI communities to locate, adapt and improve public domain material. Upstream PCI activities included volunteer physical and digital archives, enthusiast fan communities and initiatives such as the Wikimedia Commons. Engagement with external PCI communities at the procurement stage helped firms reduce acquisition costs, improve the quality of inputs and generate new product ideas.

Some firms became involved with external PCI activities after being commissioned for a specific project (work-for-hire). For example, creator Stephanie Posavec was commissioned to create interactive visualizations based on the works of Charles Darwin. When searching for digitized versions of Darwin's work, her team came across the Darwin Online archive, a volunteer digital database. Becoming involved with upstream PCI with the archive allowed Posavec to obtain accurate digitized text to use in her visualizations. She later contributed to the upstream PCI by sharing back her own dataset.

To remain competitive over time, firms reported investing in talent acquisition, workflow efficiency, creative technology and innovation/knowledge capacity. Firms invested in their relationships with upstream PCI communities, viewing them as a valuable source of inputs to future product development.

One entrepreneur (Eugene Byrne) was initially commissioned by a UK Arts Council to create a graphic novel based on the life and accomplishments of Isambard Kingdom Brunel. This success led to his firm exploring its own products based on other upstream public domain inputs. Byrne worked with local historical societies and the openly available Internet Archive to source

material about other historically important figures. Developing new products this way helped his firm move away from the WFH model, by reducing creative development costs and reducing risk at a point when the firm was resource constrained. Some firms combined multiple internal and external activities. Auroch Digital was commissioned to create a simulation game based on the Jack the Ripper mythos. The firm relied on volunteer public archives of newspaper materials from the 19th Century to source content for the game. Later, Auroch worked with a commercial board-game manufacturer to adapt an electronic video game. Commercial licensing, original development, and engagement with upstream PCI all became ingredients of Auroch's business model.

5.3 Fully engaged (upstream and downstream)

Certain firms were open at both ends of the value chain, using inputs from upstream PCI and revealing aspects of their own products to downstream user-innovators. These firms were both consumers and producers in a niche market, using knowledge gained from the community to improve their own product offering. Interviewees reported being 'fans' of the products they developed in a co-productive relationship with audiences made up of other consumer/creators. These firms reported benefits in terms of product development and marketing, from their status as community members and familiarity with the underlying social norms governing communities. For example, the founder of Three Turn Productions and creator of a computer game called *Ever, Jane* was a member of the Jane Austen Society and familiar with fan readings and expectations about functionality required for an interactive video game. While in open beta development her game was free to play, and she used suggestions from players to refine and improve the game before release. Initial value capture was accomplished through advance product sales on crowdfunding platform Kickstarter.

These firms drew upon expertise from downstream community members to improve and refine products. Shakespeare Books was founded by a former educator who taught in the English

Literature curriculum and identified an opportunity to improve the appeal of Shakespeare in schools. Through knowledge acquired via consultation with other teachers, the firm developed graphic adaptations of Shakespeare and teaching aids for the educational community. Red Wasp design produced a computer game based on the public domain stories of H.P. Lovecraft, and reported benefiting from a large and passionate fan base of which the firm was also a member.

Firms in this group relied heavily on volunteer communities to beta test and improve their offerings. As a result, products were released unfinished, with the expectation that developers and users would improve the product over time. While this approach appealed to some consumers who valued the experience of inclusion in product development, it limited size of the overall market.

Engagers tended not to invest heavily in marketing or distribution, relying on community dynamics to attract new consumers. Respondents noted that the small size of their market likely deterred larger competitors from entering, even with superior products. The firms in this group invested heavily in communicating with communities of user-innovators, both in product development and after sale. They actively maintained blogs, Twitter feeds and product support forums to converse with users.

6. DISCUSSION: PRIVATE-COLLECTIVE INNOVATION IN CREATIVE FIRMS

Interview respondents reported varying levels of benefit to using open and freely available inputs, mirroring findings from research on PCI in neighboring industries. For non-engaged users there were some cost savings from using public domain materials as inputs to product development, although these firms tended to have larger product development budgets overall. Other benefits included absence of a license payment to a preexisting rightsholder, as well as reduced transaction costs related to locating and asking permission to use a work. Cost savings and availability helped certain firms to achieve the 'credible promise' of a prototype and bring a new product to market (Haefliger et al, 2008).

Another group of firms made enhanced use of PCI in the procurement phase. These tended to be smaller firms that relied on upstream PCI communities to curate and improve the quality of inputs prior to commercialization. Using upstream PCI helped firms to further reduce acquisition costs. Firms solved the problem of acquiring high-quality inputs by tapping in to voluntary collective projects, finding that open crowdsourced data were highly accurate and useful. PCI communities themselves benefitted from contact with commercial firms. The Stephanie Posavec/Microsoft Research collaboration returned their improved data back to the volunteer Darwin archive from which it was initially obtained. Such 'share-back' of innovation has been observed in other PCI efforts, notably in the return of software code to an open source project by commercial users. Reasons given include bugfixing, reputation, marketing, and complementarity (Henkel, 2006).

Some firms found it profitable to engage with upstream as well as downstream PCI (open at both ends). In a copyright-restricted environment, audiences are limited in their ability to quote, re-use and adapt a product outside of narrow fair dealing exceptions to copyright. However, when a product originates from the public domain, its users may contribute their own derivative adaptations more freely: fans of Jane Austen or H.P. Lovecraft can write their own fictional scenarios, teachers may improve and share lesson plans based on Shakespeare and coders may build upon and improve software under an open license. For certain engaged firms and consumers, the benefits of co-creation outweighed the costs of releasing an unfinished product lacking mainstream features.

Fully-engaged firms viewed the involvement of audience members and fans as critical to improving their products and increasing the market for future releases through word-of-mouth marketing. For example, when choosing to adapt a video game based on the public domain works of H.P. Lovecraft, the creators explained the value of the preexisting fan community:

> ‘If a public domain story has nothing interesting done to it, and people just kind of venerate it, it essentially traps it in amber. I think it is important that you’re growing something for fans, because obviously they want to see more stuff come out. When they don’t get it they’ll make it themselves, and where they do get it, they’ll make it themselves anyway, but more so.’ (Red Wasp Design).

The primary dynamic described in research on PCI, that increased private benefits accrue to free revealers in a collective project, appears to hold in the case of certain creative firms. They are uniquely able to generate and capture value from openness by investing in relationships with communities who improve and circulate their products.

7. CONCLUSION

The experiences related by creative industry firms in this study offer insight on the relationship between intellectual property regimes and private-collective innovation. Like the maker-entrepreneurs described by Troxler and Wolf (2017), creative firms that engage PCI communities are linked to value generation activities beyond their boundaries. Previous research on PCI has tended to overlook the importance of intellectual property licensing environments to success of collective projects. The present study illustrates that an open intellectual property environment can enable business models which rely on user co-creation. For certain PCI-engaged firms, the requirement for strict IP protection appears lower than for firms pursuing traditional product-based strategies. This is somewhat counterintuitive, because openness requires that works circulate widely beyond creators’ direct control (making them easier to copy). However, the absence of copyright protection offers opportunities for PCI by inviting audience circulation, re-use and improvement of products.

Strong copyright protection has been considered necessary for creative industries to thrive, by giving firms the ability to fully control downstream uses of their intellectual property.

Copyright remains important for many traditional firms that rely on revenue from licensing or selling their products. This study has shown that some creative businesses rely on alternative mechanisms of value generation and value capture. These firms do not use public domain materials only because they are free. The ability to freely and openly use material is critical to business models where value is generated or captured via the collective participation of users.

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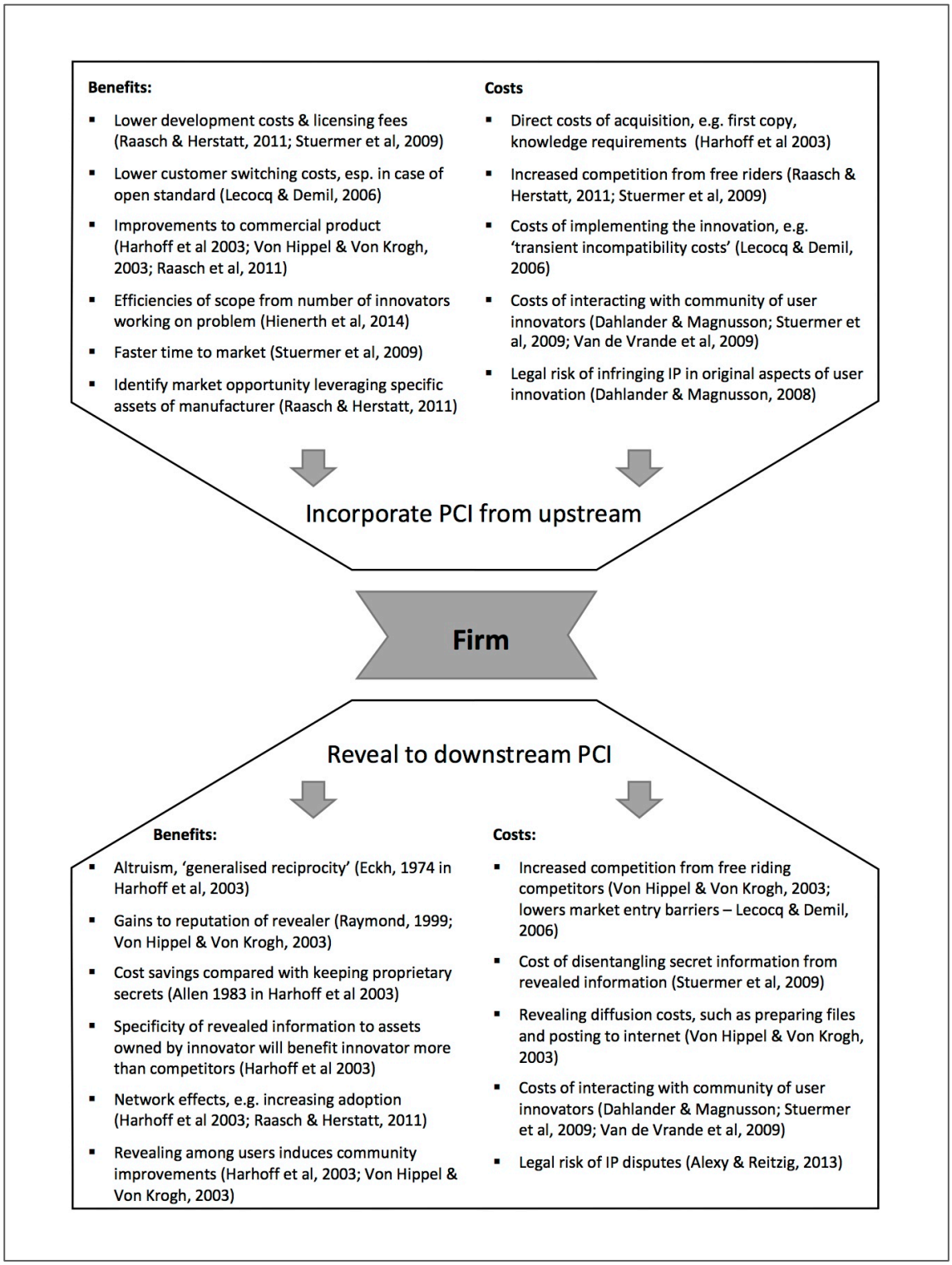
Table 1: Summary of creative firms interviewed

Firm	Public domain input	Commercial product	PCI activity
Little Loud	Various fairy tales	Interactive software	Non-engaged user
Rufflebrothers	Fairy tales, Charles Dickens	Animations	Non-engaged user
Cyber Duck	Bram Stoker's Dracula	Graphic novels	Non-engaged user
Onilo	Various fairy tales	Interactive whiteboards	Non-engaged user
Inkle	Jules Verne's Around the World in 80 Days	Interactive software	Non-engaged user
Nosy Crow Books	Various fairy tales	Children's books	Non-engaged user
Mark Bruce Company	Bram Stoker's Dracula	Theatre performances	Non-engaged user
Neil Bartlett	Oscar Wilde, Charles Dickens	Theatre performances	Non-engaged user
Intelligenti	Bram Stoker's Letters	Interactive software	Non-engaged user
Auroch Digital	19th Century Newspapers	Computer games	Upstream
Eugene Byrne	19th Century photographs and text	Printed books, mobile apps	Upstream
Stephanie Posavec/ Microsoft	Darwin's Origin of Species	Interactive software	Upstream
People Like Us	Wikimedia Commons imagery	Performance	Upstream
MyVox Songs	Various folk songs	Animated nursery rhymes	Upstream
Laurence Anholt	Various artistic works (impressionist paintings)	Printed books	Upstream
Heuristic Media	18th-19th Century maps of London	Mobile apps	Upstream
Abbie Stephens	Darwin's Origin of Species	Videography and animation	Upstream
I Can Make	Various architectural landmarks	3D printing consulting services	Upstream and Downstream
Three Turn Productions	Works of Jane Austen	Computer games	Upstream and Downstream
Red Wasp Design	Works of H.P. Lovecraft	Computer games	Upstream and Downstream
Shakespeare Books	Works of Shakespeare	Printed books	Upstream and Downstream
UsTwo	Creative Commons photographs	Messaging apps, games	Upstream and Downstream

Figure 1: Costs and benefits to commercial users of private-collective innovation



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