Crowdsourcing and Open Innovation: A Study of Amazon Mechanical Turk and Apple iOS

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Abstract: Open innovation has attracted widespread attention. A number of critical voices have recently surfaced who have called for a more rounded assessment that moves beyond the firm and the focus on benefits. In response, this paper provides a counterpoint to the positivity with a focus on labour issues and external actors. Attention is directed towards crowdsourcing and the ways in which firms have opened up their boundaries to external labour via a digital platform. Two distinct case studies - Amazon Mechanical Turk and Apple iOS - will be used to illuminate the nature of the relationship between the firm/platform owner and the external labour that participates in crowdsourcing. The study shows that while open innovation provides benefits at the firm level, this does not necessarily translate into benefits for labour.

Keywords: Open innovation; crowdsourcing, digital platform; Amazon; Apple; Mechanical Turk; iOS; labour; work and employment.

1 Introduction

At the heart of open innovation sits the proposition that firm's can capitalise on expanding the range of their research and development activities by using 'external ideas as well as internal ideas, and internal and external paths to market' (Chesborough 2003: XXIV). This model has attracted widespread attention from both academics and practitioners alike, despite its conceptual ambiguity (Dahlander and Gann 2010). Starting from the assumption that open innovation encompasses the drive to open up company boundaries to various stakeholders in order to harvest creative ideas, the focus of this paper is on a particular strand of open innovation: crowdsourcing.

One of the criticisms levelled at open innovation is the predominant focus on benefits, often employing descriptive case studies as illustration, in the absence of any form of criticality (Dahlander and Gann 2010; Trott and Hartmann 2009). Even when negative aspects are reported, this tends to be oriented towards the firm and concerns issues such as intellectual property, the erosion of firm boundaries, coordination costs,

etc. Therefore, in contrast to extant literature, this paper aims to provide a counterpoint to the positivity surrounding open innovation, with a particular focus on crowdsourcing. Crowdsourcing occurs when a company uses a digital platform to leverage the crowd (as external resources) to contribute labour that could alternatively be performed internally by employees or contractors (Brabham 2008). . The most significant differences between the crowdsourcing labour model and a traditional workforce centres on flexibility, scalability, access to a broad range of skills and experiences, with costs which are substantially less than those associated with more traditional forms of employment. It appeals to employers given the low costs of labour, overheads, and administration, coupled with the lack of employment regulations and employer security.

2 'Putting out': Open business models and crowdsourcing

Such is the positivity surrounding open innovation that the business case is seen by many as being self-evident (Dahlander and Gann 2010). More recently, critical voices have begun to emerge, in two main areas. Firstly, questions have been raised about the extent to which the use of external resources is particularly novel with suggestions that open innovation merely provides a label for practices already in existence (Dahlander and Gann 2010). Further, the initial formulation of open innovation with a dichotomisation of open versus closed systems (see Chesborough 2003) has been utilised for dramatic effect when degrees of openness more accurately reflect developments within industry. Secondly, critiques have emerged that question why this particular package of concepts and ideas has achieved contemporary currency. Its simplicity has helped popularize the notion of technology transfer and knowledge exchange by firms that may have previously shown limited interest in innovation management. This is facilitated by the ease with which both academics and managers adopt fads and fashions (Trott and Hartman 2009), with innovation management being a follower of other management ideas (Huizingh 2011).

Accounting for the appeal of open innovation has led researchers towards the broader social and economic landscape as a way of explaining how this context provides fertile territory for its popularity. Some of the changes relate to 'transformational shift', such as the rise of network organizations and increasing globalisation (Dahlander and Gann 2010; Huizingh 2011). Developments in market institutions such as IP, venture capital, and technology standards and intensity ease the trading of ideas across geographies. Others point to changes in work and employment patterns, ranging from outsourcing, agility and flexibility (Huizingh 2011), towards portfolio careers (Dahlander and Gann 2010) and the need to access the talent of increasingly mobile knowledge workers (Chesborough 2003).

Although there is acknowledgement that changing work and employment patterns have potentially contributed towards open innovation initiatives, what is striking about the open innovation literature is the neglect of labour issues. Labour resources barely receive a mention, despite acknowledgement from Chesborough (2003) that open innovation also entails cost cutting and profit maximization. This could explain the limited links forged between the open innovation literature and crowdsourcing (aside from examples such as Gassmann 2006), since crowdsourcing is often perceived as the virtual equivalent of outsourcing menial tasks to low-cost geographies.

While open innovation extends beyond opening up the boundaries of the firm to external labour sources, crowdsourcing is typically viewed as supplying labour resources only. At this juncture, difficulties arise. Capturing external knowledge which is 'out there' and waiting to be acquired by the corporation involves a complex sourcing process (Dahlander and Gann 2010). This is compounded by the lack of clear conceptualisation of knowledge work, as numerous definitions abound to the extent that 'there is no work that could not be considered knowledge work' (Fleming et al 2004: 742). This leads back to the limited conceptual clarity regarding Chesborough's (2003) suggestion that external ideas can simply be absorbed by the firm.

The problem of ambiguity is also evident in the crowdsourcing literature, where a variety of definitions and typologies exist (Brabham, 2008; Estellés-Arolas & González-Ladrón-de-Guevara, 2012). The term was initially presented as a new level of outsourcing whereby, instead of sending jobs to low-wage countries such as India and China, companies could outsource functions once performed by employees to an undefined and generally large pool of cheap labour: everyday people in the form of an open call via the Internet (Howe, 2008). For simplicity, we suggest that crowdsourcing can be viewed as the coming together of open innovation and outsourcing as digital platforms leverage external resources for idea generation and exchange. This extends traditional outsourcing as companies use distributed labour networks to source external labour, harnessing expertise on an unprecedented scale.

Opening up an organisation to outside partners is largely based on the desire to enhance competitive advantage (Dahlander and Gann 2010) with crowdsourcing being adopted to harness creative potentials for profits (Howe 2008). In 'lean times' the free flow of people and creative ideas enables firms to shift costs and offload risk, potentially creating network effects and accelerating the market (Chesborough and Garman 2009). Many authors view crowdsourcing as an opportunity to both create and capture value with the sourcing of labour/expertise for low reimbursement. Few authors report on the more negative aspects of crowdsourcing and reflect on this manifestation of open innovation from the perspective of external parties. It is in this context that employees receive reimbursement that is significantly lower than the value created for the firm, as they sit outside the boundaries of traditional labour laws and regulations (Kleemann, Voß, & Rieder, 2008). These issues will be elaborated upon in the next section, which offers an analysis of two popular crowdsourcing applications.

3   Case Study Illustrations: Amazon and Apple

While examples of open innovation exist in diverse areas, it is perceived as being especially relevant to high tech industries (Gassmann 2006). Indeed, part of the inspiration for Chesborough's early work derived from open source software and the belief that peer-production and co-creation could be successfully applied within other industries. With this in mind, two illustrations are provided of technology firms which 'embody a mutual working relationship between two or more parties aimed at creating and delivering a new product, technology or service' (Chesborough and Schwartz 2007: 55). The examples have been selected because (a) Amazon Mechanical Turk is well developed, commonly used (Crowston 2012), and has cornered the market in online tasks (Felstiner 2011); (b) Apple is the pioneer of platform-based application development

using third-party developers and remains one of the market leaders. As crowdsourcing platforms they both differ from the more predominant examples of open innovation in that they focus on business-to-consumer aspects rather than business-to-business, involving many-to-many relationships between buyers and sellers.

Amazon Mechanical Turk

Established in 1995, Amazon is a US firm that has become the world's largest online retailer. After initially entering the market as an online book retailer, Amazon soon diversified by licensing their platform to a wide range of companies, and transformed to become an online retailer offering a wide range of consumables. Critical to its evolution is the digital platform which serves as an electronic marketplace and coordinating hub facilitating the sourcing of products with consumer purchases. With the introduction of Amazon Mechanical Turk (AMT) the company expanded their business, this time by mediating and selling work capacity. AMT is an online crowdsourcing system which distributes tasks to a large number of anonymous workers. It began as an in-house service to support business processes, outsourcing piecemeal tasks to contractors that required them to identify duplicate product web pages (Crowston 2012). Realising the potential of the service, Amazon expanded their platform by rolling out AMT as a public site in November 2005, describing it as 'a marketplace for work' (Mechanical Turk 2013a).

AMT is based on a tripartite structure whereby the vendor (Amazon) own and develop the platform, upon which firms or third-party requesters broadcast tasks (known as human intelligence tasks – HITS) and workers (or Turkers) complete and submit the HITs. As a broker, Amazon promotes AMT as enabling workers to 'work from home; choose your own work hours; get paid for doing good work'. In this respect, AMT echoes some of the utopian discourse of 'telecottaging', with workers exercising control over when and where to work, for how long, and choosing which tasks to perform. From the perspective of requesters AMT provides a platform where firms can 'have access to a global, on-demand, 24 x 7 workforce; get thousands of HITs completed in minutes; pay only when you're satisfied with the results' (Mechanical Turk 2013a). While some of the early adopters of crowdsourcing were small firms with limited resources, as the platform expanded and became more sophisticated, medium and large firms entered the marketplace (Felstiner 2011). Mechanical Turk is a heavily tailed market and there is considerable clustering of top requesters, with 0.1 percent of total requesters accounting for 30 percent of overall market activity (Iperios 2010).

In terms of governance, Amazon set the terms in the only governing document: the Participation Agreement. This provides guidelines on the use of the site and the relationship between requesters and providers. To access the platform, both requesters and providers consent to the Participation Agreement (Mechancial Turk 2013b), which requires registration using an Amazon account. This provides Amazon with the necessary personal and tax information and positions them as financial intermediaries, reimbursing workers through their online payment service, as well as extracting a 10% service fee from requesters. The Participation Agreement stipulates that workers perform services as independent contractors, not employees, and place all juridical rights to the requesters. There is no true legal protection, which alleviates the regulatory requirements of paying workers minimum wage (Felstiner 2011).

Once the worker accepts the HIT, it must be completed within a designated timeframe. However, there is no time limit for firms evaluating the task or for providing reimbursement. The mandatory satisfaction clause gives the requester the authority to reject a HIT without any justification, without payment, and without forfeiting their possession or ownership of the work carried out. Amazon can cancel a provider account at any time for violation of the terms of the Participation Agreement and the provider may forfeit any remaining earnings. Yet the governance structures are such that Amazon declines all responsibility related to the transactions between requesters and providers in terms of quality, safety, or payment issues and stipulate: "you use the site at your own risk". Workers have little detail on their employers and only limited information about the tasks while firms can access the employment history of Turkers. The lack of transparency raises ethical questions as workers are unable to make judgments about the moral valence of their work (Zittrain 2008).

AMT is based on a cognitive piecework model that breaks down and distributes tasks, many of which are repetitive, and low paid (Crowston 2012; Felstiner 2011; Ipeirotis 2010). According to survey research, transcription is a common task, and this attracts a comparatively higher fee, while classification and categorization tasks also feature strongly, many of which are lower paid (examples include data collection, image tagging, usability testing of websites, etc) (Ipeirotis 2010). In relation to payments, 25 percent of the HITs are valued at $0.01, 70 percent offer $0.05 or less, and 90 percent pay less than $0.10. This is seen to equate to an hourly rate of around two dollars (Irani and Silberman 2013). When AMT was initially launched, cash payments were only made available to workers with a US bank account; all others received Amazon gift cards. This discouraged non-US workers from joining the platform and resulted in a workforce typically representative of US internet users (Ipeirotis 2010). When AMT changed the payment structure, the workforce internationalised, notably with workers from India (Ross et al 2010).

In terms of value capture and creation, Amazon's success can largely be attributed to its ability to expand the digital platform that hosts the trading of consumables on a significant scale. Amazon's position as a market leader enhances its negotiating power with suppliers, who are drawn to the network given the access to a broad consumer base. Adding Mechanical Turk to their offerings expands Amazon's position as a platform provider, offers inroads into new markets, strengthens existing market share, and generates revenue with the 10% fee levied on transactions.

Apple and iOS

Apple Inc. has experienced a chequered business history, yet recent success has led to its depiction as a 'stock market star' (Froud et al. 2012). The Apple business model is based on the close coupling of hardware and software, which involves distinct global sourcing strategies dependent upon how value is captured and created. Within the last decade, the emergence of hardware products such as the iMac, iPod, iPhone, iPad, and Apple TV has led to a significant expansion of market share; these products are supported by a variety of software services, including the sale of digital content and applications through iTunes, the App store, and iBookstore. Much of Apple's success can be attributed to the embedding of high-end innovative artifacts into a centralized platform that functions like an electronic marketplace and coordinates supply and demand. It is the fusing together of

technology, services, and facilities that is regarded as 'greater than the sum of its parts' (Cusumano and Gawer 2002), as the integration of software content and hardware products drives growth. Such is the success of this combination of products, platform, digital content, and online services that Apple's CEO, Tim Cook, has suggested that we have entered a 'post-PC world,' evidenced in sales of devices such as the iPod, iPhone and iPad.

In terms of the supply of digital content, it was not until the launch of the iPhone in 2007 that Apple opened its organizational boundaries to external developers willing to provide applications and services. Apple unveiled its platform in 2008 and released the Software Development Kit (SDK), allowing developers to create mobile applications, initially for the iPhone. In terms of governance structures, Apple owns the platform and acts as broker between third-party developers and consumers. Apple sets the parameters for the development environment, and its reputation for tight corporate control and high levels of centralization (Cusumano 2010; Dedrick et al. 2009) is evident in platform construction and coordination. They exert censorship over the development process, as their SDK determines precisely what type of software functionality can be made publicly available. In 2010 Apple bolstered control with the release of 113 review guidelines (Apple 2010), which determine which applications will be available for general release. The distribution channel is mediated by Apple, which can halt an application's release if deemed inappropriate or unsuitable.

Since the inception of the App Store in 2008, more than 775,000 apps have been made available with more than forty billion downloads (Apple 2013). The App Store links developers with consumers; they set their own price for the application and retain 70% of sales and in-app advertising revenues. In January 2013, developers had earned more than $7 billion from app downloads which translates into developers receiving an average of 17.5 cents per app download. When these transactions are combined, the figures are substantial: given that Apple top slice 30% of revenues, this equates to around $3 billion for Apple (Apple 2013), which is approximately 10 per cent of its net income (Haslam et al 2013).

For consumers, the appeal of Apple's devices is closely linked with the availability of online content and services. In opening up the platform to external labour, Apple has outsourced the development of content while minimizing its own risk as developers create apps that may or may not be successful. There is no direct remuneration provided for the development and supply of content; instead, the costs and risks are borne entirely by the developers themselves. This has enabled Apple to externalize expenses associated with costly software development while enhancing the value captured from product sales. From 1995-2012, Apple's internal labour costs have fallen from 20-30% of total income to just 10% of total income, thereby boosting their cash margin and reducing relatively high labour costs (Haslam et al 2013).

From the perspective of external labour, a qualitative study of Apple developers revealed the hidden pressures associated with developing successful mobile apps (Bergvall-Kåreborn and Howcroft 2013). The economic logic of working life becomes central as external developers are regularly exposed to excessive working hours and unstable employment. There are significant drawbacks since there is no guarantee of success and income is variable and unpredictable. Indeed, the downside of working on

emerging technologies is that their contemporaneousness is characterised by uncertainty, which intensifies already precarious working conditions.

The platform serves not only as a channel for developing and distributing digital content, but also as a means of 'owning the consumer' (Montgomerie and Roscoe 2013) as the supply chain ties consumers to Apple devices. The lack of interoperability enables Apple to maintain a key position in the digital download market as consumers are locked-in to the platform, especially when they have invested in increasingly sophisticated apps. Apple are able to leverage the platform to control how content is used and transferred, and by imposing high switching costs. When combined, Apple's iOS offers an example of what Chesborough (2003) describes as an 'innovation one-stop centre', in that Apple

> '…take the best ideas (from whatever source) and deliver those offerings to their customers at competitive prices. Like innovation marketers, they thrive by selling others' ideas, but are different in that they typically form unshakeable connections to the end users.'

In the spirit of open innovation, Apple has re-drawn the boundaries of the firm through external sourcing, the consequences of which has re-calibrated its financial boundaries, enabling them to capture higher return activities (Haslam et al. 2013).

Table 1 summarises AMT and iOS and outlines key commonalities and divergences.

Table 1 AMT and iOS Commonalities and Divergences

	Amazon	*Apple*
Key role	Vendor, platform owner, and broker	Vendor, platform owner, and broker
Relationships	Requesters and providers	Developers and consumers
Vendor Mediation Fee	10% of HIT	30% of all sales and in-app advertising revenue
Contractual Relationship	Responsibility lies with requester	Responsibility lies with Apple (via app review process)
IP Ownership	Requesters	Developers
Scale	200,000 requesters (2009) Requesters post between 20-40K new HiTs each day	In 2013 775,000 apps have been made available with more than forty billion downloads
Revenue (third-party providers)	Fixed fee per HIT	Determine own fee, but revenue generation is subject to number of downloads
Types of tasks	Micro, macro, and simple projects, complex projects (most rare)	Generally holistic development, with either lone developer or project-based in small teams.
Value creation and capture	Expands role as a platform provider, enhances market share, value skimming of 10% from each HIT.	Digital content fuels the sales of highly profitable hardware products. Close coupling of services and

		products enhances consumer lock-in, driving growth. Value skimming of 30%.

4 Discussion

Securing success with open innovation is not without its challenges and the literature has highlighted a number of areas of concern. Firstly, there is the issue of *control*. As noted by Chesborough (2003: 36) 'in the old model of closed innovation, firms adhered to the following philosophy: Successful innovation requires control'. While open innovation is often perceived as yielding elements of control, this does not necessarily equate to a lessening of control. In the examples of Amazon and Apple, as platform owners, they orchestrate activity among a network of external parties and crucially, have the final say over how much control to relinquish. This mixture of tight control of the platform coupled with a loosening of access to external parties has led Cusumano (2010) to describe Apple's platform governance as 'open but not open'.

Chesborough and Appleyard (2007) emphasize the importance of ownership of resources that are creating value, which links to the second issue: the *alignment of business models* (Chesborough and Schwartz 2007). From the perspective of the core firm, one of the advantages of crowdsourcing is that the 'crowd'is so widely dispersed that power asymmetries mean the crowd can only react to the changing strategies of platform owners who dictate terms and conditions (e.g. via the Participation Agreement; SDK, approval for the App Store). Thirdly, the challenge of deciding precisely *what to reveal* to the external environment, involves creative management of the supply chain (Chesborough and Appleyard 2007). This complements business model alignment as market failure can occur when firms are reluctant to reveal how they intend to evolve, thereby resulting in a perceived misalignment. Finally, *intellectual property rights* are a major inhibitor to the trading of innovations. This issue is of concern with B2B collaborations but it takes on a different manifestation with crowdsourcing as work is distributed to a large pool of anonymous workers. In the case of Amazon, intellectual property resides with the requesters, since task completion is of limited relevance to Amazon. Instead, the benefits of open innovation lie in platform coordination which in itself delivers financial returns. Regarding Apple, while external developers own the IP, they also shoulder the negative consequences of similar apps becoming available as this impacts personal revenue generation. This issue is insignificant for Apple, given the sheer scale of participation. From the perspective of both Amazon and Apple, opening up their boundaries to external parties has intensified their position within the market while simultaneously closing off the competition, which is essential to their ongoing success.

5 Conclusion

In response to Dahlander and Gann's (2010) call for open innovation research in other empirical settings, as well as research that focuses on less positive outcomes, this paper explores crowdsourcing and the use of digital platforms. This examination enables an

understanding of why crowdsourcing is an attractive strategy from the firm perspective and also raises interesting questions about open innovation from the perspective of the actors who contribute external resources. What is distinctive about these buyer-seller networks is the centralisation of control via the platforms, providing the gateway to consumers, while leveraging the crowd to boost firm success. The provision of intellectual labour and creativity from outside the firm, when aggregated, has a combined value that is far higher than revenue generated.

Crucially, from a work and employment perspective, the platforms discussed here are more than a facilitator of digital outsourcing services; they play an active and fundamental role in establishing the market conditions for crowd labour. Platforms and their vendors may serve different purposes and occupy different market positions, but they enable firms to bypass the traditional routes of procuring labour supply (Felstiner 2011). These high-tech giant firms are not simply passive middlemen in a long supply chain, but exercise control over the creation and continuance of employment relationships, at the same time as extracting revenue. One way of accounting for the currency of open innovation suggests that shifting work and employment patterns, notably portfolio careers, has meant that firms need to consider how best to access talent (Dahlander and Gann 2010). Viewing this from a labour perspective, another explanation could point to changes in work and employment, which have witnessed the decline of standard labour contracts and rising self-employment (Pongratz 2008) mounting insecurity (Green 2009), and work intensification (Thompson 2013). Perhaps when facing these wider trends, particularly in an age of austerity, workers are more inclined to submit their skills and knowledge to crowdsourcing platforms. Many are struggling to make a living, and the arrival of crowdsourcing is a continuation of the 'race to the bottom' (Brabham 2012). As our study shows, business model innovation from the firm perspective does not necessarily translate into positive benefits throughout the value chain. This rings alarm bells about the future sustainability of crowdsourcing, particularly regarding the ability of firms to attract highly qualified external workers. It also raises serious questions as to whether crowdsourcing platforms could potentially subsume existing industries, such as data entry, audio transcription, technical support, and software development, leading to even more precarious working practices.

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