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Platform-based Open Innovation Business Models: Bridging the gap between value creation and value capture

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Michael Seminer

ABSTRACT

By conducting in-depth interviews with software developers participating on the iPhone platform, this dissertation aims to examine platform-based open innovation business models from the perspective of third-party developers. The iPhone case study is examined in-depth by use of empirical examples and interview findings.

A detailed theoretical analysis summarizes the inherent tensions involved in the implementation of open innovation business models. It recognizes that by combining participants of outside value creation with corporate value capture principles, a level of friction is inevitable. A framework is crafted, which encompasses the fundamental challenges of the open innovation platform approach. This includes the topics of motivation, intellectual property rights, and the role of gatekeepers. How these characteristics are managed is essential to the success of an open platform.

In parallel to the framework, the research examines each design decision from the perception of third-party developers. This research finds evidence that successful implementation of open innovation business models can bridge the gap between value creation and value capture generating value for the platform and participating developers. It was also found that design decisions could add or decrease value to a platform based on the business model's ability to effectively balance the needs of all parties.

1. INTRODUCTION

In 2007, Time Magazine honored Apple's iPhone with its coveted 'Invention of the Year' award. The reasoning was simple; while the iPhone is incredible in its design and ability to bundle various digital elements (such as a Phone and media player)[1], Time declared that

> *it's not a phone, it's a platform… It's a genuine handheld, walk-around computer… And this is just the beginning. Platforms are for building on. Last month, after a lot of throat-clearing, Apple decided to open up the iPhone, so that you—meaning people other than Apple employees—will be able to develop software for it too* (Grossman, 2007).

While Apple is not the first to open its platform to outside developers, it is by far the most popular and hyped platforms of all time. Since the iPhone's introduction in 2007 over 21 million total devices have been sold and over 65,000 third-party software applications developed (Ankur, 2009). On a daily basis, hundreds of blogs devote their attention to new stories and developments in the world of the iPhone. Perhaps Time Magazine should reconsider the label of 'Invention of the Year' and instead coin the honor with 'Innovation of the Year'. After all, the term 'invention' is simply an idea made manifest, while 'innovation' refers to "incremental, radical, and revolutionary changes in thinking, products, or processes" (Tuomi, 2002). No doubt that by providing thousands of third-party developers with the ability to generate profound creations and potentially steady incomes qualifies the iPhone as being an innovation.

However, the iPhone is not seen by all as a subversive system of software production. Proponents of open source software production have been witness to incredibly efficient and innovative forms of development for over 20 years and have serious issues with the proprietary profit-making philosophy. At the heart of the debate is an individual's right to free and uncontrolled information.

Since the rise of the open source movement, the approach and methods of software production have become a battleground that have encapsulated a plethora of debates among various academic fields and knowledge-based industries. The proprietary software incumbents insist that the heavy resources of the production process require information to

[1] Detailed description provided in section 4

be monetized in order to fund future innovations. They dictate that no other option is realistic to motivate such profound innovations.

On the other side, the under-resourced and decentralized guerilla tactics of the open source communities have proved proprietary regimes wrong. Deeply rooted philosophical principles of altruism, collaboration, and community quickly produce software applications and platforms that successfully compete with proprietary development. It is profoundly evident that an unstructured, unpaid labor force can successfully innovate on the same level of proprietary development and without the driving force of a market economy. However, various open platforms claim that they have begun to find the subtle balance that conjoins open and closed design characteristics with the needs of the various stakeholders involved. This paper aims to further understand the hybrid relationships that occur after mixing the dichotomous principles in what is known as open innovation business models. In particular, by examining Apple's iPhone platform and by conducting in-depth interviews with third-party developers, I aim to further understand the needs and perceptions of outside innovators participating in open innovation environments.

I also use this dissertation as a call-to-action to researchers. Open innovation has become far more complex than a simple balancing act between the dichotomous schools of thought. The evolution of open innovation has moved exponentially over the past decade and therefore, techniques and experimentation have become far too wide in scale and scope. As a result, academic research has struggled to keep up. I provide some possible solutions and room for further inquiry in future studies.

2. LITERATURE REVIEW

Introduction: Open Innovation Business Models

The open innovation paradigm is a multidimensional business model incorporating both closed and open strategies of production into the innovation process and has been explored in depth and scope by many leading academics (see Gawer & Henderson, 2007; West, 2006; Ernst, 2005; Chesbrough, 2005; Gawer & Cusumano, 2002; von Hippel, 1988). Like traditionally closed, proprietary models of production, open innovation emphasizes a detailed strategy for value capture. In other words, it aims to profit from its innovations (Germany & Muralidharan, 2001).

The paradigm differs from closed models in its desire to gain ideas, and knowledge from outside the boundaries of the company. This approach to innovation recognizes that new, affordable technologies have allowed value creation[2] to spawn from unlikely places. It assumes that the exploitation of valuable intellectual property "that once germinated only in large companies now may be growing in a variety of settings - from the individual inventor… to the research facilities of academic institutions, to spin-offs from large, established firms" (Chesbrough, 2005: 3).

However, while exploitation of outside value is an essential characteristic of open innovation, the real challenge is to determine ways to profit from it (Germany & Muralidharan, 2001). Companies interested in open innovation strategies must consider a host of essential elements that respect the perceptions and needs of outside innovators, while at the same time not losing focus of the internal value capture vision. The aims of these two parties are often at odds.

To further understand the balancing act of both parties, I first explore inherent characteristics of value creation focused communities. Since my research is being framed within software production, this is explored within open source software production theory. This provides the reader with a basic understanding of the dichotomous tensions that are

[2] 'Value creation' refers to any symbolic or material good that has been produced by a system or individual. This does not imply that the good has or can be commercialized. 'Value capture' is the act of profiting from 'value creation.'

inherent in open innovation strategies. Next, I define the modern understanding of the business model and describe how it is used as the tool for capturing value from outside innovators.

After this holistic distinction of the open innovation business model is made, I address the immature systemization of open innovation studies. Exposing this weakness will aid in giving a focused analysis of a particular open innovation phenomenon; the open platform software model. With this theoretical foundation, I develop a framework that aims to prioritize the challenges of providing for the needs of outside innovators within open innovation business models:

(1) Motivations; (2) Intellectual Property Rights; and (3) Role of Gatekeepers.

Outside Value Creation[3]: Open Source Software (OSS)

There are two factors that have influenced a torrent of outside value creation over the past several decades. First, easy and affordable access to powerful technologies and communications such as personal computers and the Internet have enabled small companies and individuals to produce and distribute a high volume of symbolic goods (Castells, 2000). Second, these new technologies have led to a culture and philosophy of openness, mass collaboration, and altruism. These factors have allowed for the development of open innovation strategies because individuals are now able to collaborate on a massive scale from outside the boundaries of the traditional labor structure of the corporation.

Nowhere better can these concepts be explained than under the umbrella of open source software (OSS) theory. Not only is this mature field best used to explain advanced forms of value creation, but OSS communities are also not reliant on value capture for survival. Take a moment to think about the uniqueness of this situation. A successful process of innovation is taking place that does not depend on the centralized resources of a company or institution, releases every innovation to anyone for free, and does so without any interest in generating revenue.

[3] 'Outside value creation' refers to any symbolic or material good that has been produced outside the boundaries of a company or institution. Again, this does not imply that the good has or can be commercialized, which is 'value creation'.

OSS is an approach to the design, development, and distribution of software. OSS emphasizes that information should be freely available to everyone (von Hippel, 2005). In software production, this philosophy frees the intellectual property of source code[4], giving developers free rein to reuse, add, subtract, and alter each others' innovations. This freedom gives innovators the uninhibited ability to collaborate by "standing on the shoulders of others" (Merton, 1973). In contrast, proprietary software development secures intellectual property with the aim of recovering costs of development by appropriating rents (West, 2003).

OSS consists of virtual communities comprised of an unpaid, voluntary labor force (von Hippel, 2005). While research has shown that there is some degree of central decision-making within OSS communities, contribution often resides from a bottom-up mentality of production. In other words, participation in OSS communities is "motivated not by pecuniary goals such as value capture, but instead some combination of intrinsic and extrinsic factors" (West & Gallaher, 2005: 30). This is in contrast to proprietary forms of top-down hierarchical production processes comprised of a salaried labor incentive structure with a central decision strategy (West, 2003). It is important to recognize the parallels between open and closed forms of production and value creation and value capture. Communities with more open principles emphasize value creation, while companies with more closed proprietary elements emphasize value capture. Therefore, when a company tries to capture value from an outside value creation environment it can be assumed that the process will shift further to the closed side of the spectrum. The reader should keep this connection in mind when considering hybrid models of production.

In correlation to the above observation, OSS characteristics enable an efficient form of value creation without the need for a detailed and coordinated strategy of value capture as with proprietary companies. However, it is the inherent opposition that these characteristics have with value capture goals that make it such an efficient value creation technique. By attempting to capture value from value creation processes, you begin to strip it of its successful principles. As I will demonstrate, this tension is at the heart of open innovation theory.

[4] The written language that allows a computer programmer to communicate with a computer. It is a set of commands and stored procedures that is converted by the computer into an executable software or application program.

Value Capture: The Business Model

A business model is a framework for creating economic, social, or other forms of value. "It refers to the core architecture of a firm, specifically how it deploys all relevant resources to create differentiated value for customers" (Tapscott, 2001: 4). Essentially, the business model is a centralized and deliberate strategy initiated by a company or institution with the end goal of value capture. "A company should develop a strategy that, at a given time, matches the nature of its innovation, the motivations of the innovators and the business model of its platform" (Boudreau & Lakhani, 2009: 75). In open innovation ecosystems, the business model is a framework that balances the needs of value creators and value capturers. While not in all cases, it must be noted that the value capturer (often known as the 'sponsor') often directly controls business model decisions due to its centralized, decision-making abilities.

Chesbrough (2005) observes that "while open source shares the focus on value creation throughout an industry value chain, its proponents usually deny or downplay the importance of value capture" (Chesbrough, 2005, p3). The OSS tradition focuses on providing for the needs of its outside sources of innovation (value creation), while business models have traditionally aimed to service the needs of the firm (value capture). Germany & Muralidharan (2001) emphasize that un-captured sources of value creation "remain dormant unless it is coupled with a business system that unleashes its disruptive energy". In open innovation, the business model is the mechanism used to bridge the gap between outside value creation and value capture (Ballon, 2009). However, if open innovation business models aim to bridge this gap, the traditional notion of a business model needs to be restructured into a hybrid approach, which considers the complexity and uniqueness of outside value creation.

First, the business model should detail the source of outside innovations, the method of capturing its value, and the way in which it flows to end-users (Tapscott, 2001; Pedersen & Methlie, 2004). While exploitation of outside value is an essential characteristic of open innovation and must not be ignored, some authors neglect an important aspect that this additional layer has on the dynamic of the business model architecture. By merging outside innovators into a business model orchestrated by a corporate sponsor, complex power struggles induced by the opposing needs and perceptions of the various actors often arise.

If the business model is to succeed, this balancing these powers must be considered during its configuration.

In Pieter Ballon's (2009: 11) PHD thesis on the political economics of the European mobile industry, he aims to revise the business model concept to further align with open innovation strategies. He emphasizes that the business model has become an "analytical tool to frame the political economy of new product and services design":

> *Business models in platform markets, rather than to focus on profit maximisation in a single market, primarily deals with getting the various stakeholder groups on board, with balancing interests between these groups… It will be posited that the guiding question of a business model has become "Who **controls** the value network and the overall system design" just as much as "Is substantial value being produced by this model (or not).* (Ballon, 2009: 15)

Ballon's (2009: 52) emphasis takes the business model away from "indiscriminate and often strongly (and naïvely) dichotomic manner" and towards a business model focused on complex power relationships. In other words, in OSS communities, when value creation is the only goal, the needs and perceptions of participants are clear. Even clearer are the needs and perceptions of value capture regimes. When combining these actors by the use of a business model, a new and complex relationship is produced where actors must maneuver to secure their needs.

An interesting part of the open innovation business model is that it relies on multiple parties working together in a collaborative manner, while their needs and perceptions are often in direct contrast. If one side were to find their needs not satisfactorily met and chose to opt out of the partnership, the strategy fails. Therefore, the key to open innovation is the business model as a tool because it controls and guides this balance. The challenge of open innovation is building a cohesion that supports the right balance for the needs of sponsors, innovators, and end-users[5].

This balance must recognize and confront the complexity of power relationships. While the current analysis does not provide a detailed review of political economics due to scope of the assignment, it does require some notion of control among the actors participating in open innovation milieus. Ballon (2009: 15) suggests incorporating the

[5] The current research explores the needs of value creators within open innovation business models.

> *"political economy of information and communication technology (ICT) (re)design, which stresses that control configurations, power relationships and different forms of bias pervade ICT design, and that they profoundly influence the outcome of the design in terms of individual, societal and economic value"*

Theories of political economy of communications provide the roots of analysis for discussions of power on technology design. Robin Mansell (1993: 34) calls for an analytical framework that "must point to areas in which technical design choices become enmeshed with political and economic factors which influence the restructuring of institutions". As already described, the innate design of open innovation environments provide a cesspool of political and economic factors that ultimately lead to power struggles and inequality among the different stakeholders (if not an already preconceived notion). Since it is in all party's best interest to succeed, the business model is used as the tool for the 'analytical framework' in which technical design decisions must be made.

Classifying Open Innovation

Now that I have provided the essential buildings blocks for understanding open innovation I can begin to narrow the scope of the field and prioritize the challenges in the design of its business model. In summary, open innovation has two inherent characteristics:

1. It incorporates a hybrid innovation strategy that exploits outside intellectual property.
2. It contains complex business models with corporate sponsors often acting as its centralized decision maker.

While this classification greatly narrowed the scope of possibilities during its initial conception and development, over 20 years has passed and the field has gone through a lengthy maturation (Chesbrough, 2005). During the course of this evolution, companies have experimented with a vast array of techniques, strategies, methods, and procedures with the goal of harnessing value outside their fences. The adoption and experimentation of open innovation business models seems to be moving at an exponential rate making it difficult if not impossible for academic research to keep up. As a result, the field finds itself in a state of confusion, in which the lines of theoretical study have become blurred and the classification system immature.

As a prerequisite to my research, this paper calls for a clear and standardized classification system within the field of open innovation. It begs for a more precise analysis of the different strategies that lie within open innovation studies. I ask future researchers to recognize the various and consistent patterns that have emerged and focus their study towards its classification rather than generalizing results to the vast field of open innovation. I also ask that the classification system be flexible enough to accommodate for the speed at which the field is evolving. While this is not the main aim of my analysis, it is a necessary precondition for focusing my research. However, building a complete classification system is beyond the scope of this paper and would require professional experts and leaders of open innovation to standardize and agree. In order to focus the current research I attempt to begin the process by bringing the reader along one potential classification path. It is my hope that this framework can be modified, amended, and developed by future researchers.

First, Gassmann and Enkel (2004) recognize three separate open innovation process archetypes: (1) outside-in process; (2) inside-out process and (3) coupled process (Figure 1). The 'inside-out process' aims to make profits by releasing intellectual property (IP) and ideas to the outside market, while 'outside-in process' aims to "enrich the company's knowledge base through the integration" of outside resources. To further focus the project I examine the 'coupled process', which is defined by "coupling the outside-in and inside-out processes by working in alliances with complementary partners in which give-and-take is crucial for success" (Gassmann & Enkel, 2004: 6). It is this give-and-take that exposes power asymmetries and is at the heart of the open innovation challenge.

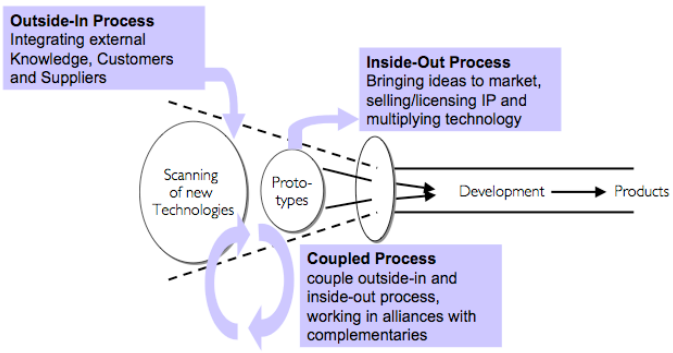

Figure 1 (Gassmann & Enkel, 2004: 6)

Next, von Hippel (1988) further classifies by distinguishing between four external sources of innovation[6]: (1) suppliers and customers; (2) university, government and private laboratories; (3) competitors; and (4) other nations. This is important to consider when accessing power dimensions of open innovation business models. Different sources of innovation will undoubtedly have different needs and wants.

Finally, the 'coupled process' can be broken up into distinct categories. To illustrate, Tennenhouse (2003: 45) describes one software production example:

> *To identify promising technologies, Intel establishes research labs near top university research groups, with open flows of information in both directions. If an innovation proves promising, Intel recruits the top academic researchers to help commercialize the technology and see it through to production.*

This 'shared partnership' approach is just one example and differs from other coupled approaches in the design of its business model. Another example, and the focus of the current research, consists of business models implementing software platform theory with varying degrees of openness. In the sections that follow, I discuss theoretical characteristics of the business model architecture in platform-based open innovation strategies. I begin with a brief overview of platform and network theory and then develop a framework summarizing three open platform elements that are often the source of power asymmetries in open innovation business models. This will give the reader further understanding of the open innovation platform-based approach and will also guide the structure for results and interpretation section.

Platform and Network Theory

Product platforms are defined as a "set of common components, modules or parts from which a stream of derivative products can be efficiently created and launched" (Meyer & Lehnerd, 1997). Software platforms consist of "tools, technologies, and infrastructure that enable developers to design and deploy Internet applications" and are provided by the platforms sponsor (Iansiti, 2009: 10). Many platforms are closed to outside developers, but open innovation assumes that some degree of outside innovation is being permitted to flow into the platform from outside sources (i.e. submission by third-party developers). For

[6] Open innovation business models are not limited to just one outside source.

example, platforms such as gaming systems only allow a select amount of third parties to develop for their platform, while Google's Android platform freely accepts all submissions (Android, 2009). This is just one of many varying degrees of openness that need to be considered when building open innovation business models.

The open platform approach uses crowdsourcing techniques to attract developers to sponsored platforms. Service Development Kits (SDKs) are provided as tools by the sponsor (outside-in process) for developers to build and submit applications for use on the platform (inside-out process). Virtual marketplaces provide a space for end-users to filter and distribute third-party innovations. Further examples include Facebook applications, Google AppEngine, Amazon Web Services, Salesforce.com and arguably the most popular example to date and focus of my research, Apple's iPhone app store platform.

Network effects are essential to understanding open platforms. "A platform needs a critical mass of adopters and a critical mass of complementary software" to make up its network (Ballon, 2009: 112). In the case of open innovation platforms there are two separate networks involved: (1) the third-party developers and (2) end-users. Both are necessary to ensure successful open platforms ecosystems. Both must be considered when crafting a business model.

Several strategic management theorists such as Gawer (2000), Gawer & Cusumano (2002), and Gawer & Henderson (2007) have suggested that the strategy of business models should be to develop a platform with the "objective to *control* a central system module around" which outside innovators may "develop a range of complementary technologies and products". The trick for companies is to do this while "reaping the benefits from a strategy aimed at fostering network effects" (Ballon, 2009: 113). The difficulty is for the business model to balance the needs and wants of all parties within the platform. As previously mentioned, business model design decisions impact the dichotomous tensions inherent in open innovation environments.

In the final sections, I devise an original framework that encompasses the business model design challenges of providing for the needs of actors participating in open innovation platforms. Devising my own theoretical framework was deemed necessary due to the lack of current theoretical insight into this specific phenomenon. This framework consists of the following parts: (1) Motivations; (2) IPR; and (3) Gatekeeper Roles.

Motivations: Crowdsourcing Theory

Platform-based open innovation strategies incorporate elements of crowdsourcing techniques into the business model to solve the challenge of motivating external sources of innovation. Crowdsourcing is defined as a company or institution providing an open call to a large network of potential laborers to perform a function (Howe, 2006). Over the past decade the success of crowdsourcing projects have led companies to explore a vast array of objectives that incorporate creative crowdsourcing techniques.

In brief, the "wisdom of crowds" (Surowiecki, 2004) is equal to or better than the wisdom of one individual. By aggregating diverse, disparate ideas, the crowd has proven to add considerable value to problem solving (Surowiecki, 2004). However, the intricacies and subtleties of motivating the crowd has been no simple task. Understanding the social dimensions of the crowd has been of extreme interest to open innovation platform strategies.

Prior research suggests that motivating the crowd to join crowdsourcing projects includes similar characteristics to the motivations of those participating in voluntary OSS production (Lancashire, 2001; Lakhani, et al.'s, 2007; Brabham, 2008). Research on the motivations behind OSS production concludes that motivations can result from several social incentives: social capital, learning new skills, enjoying the benefits of a community, and having fun (Lakhani & Wolf, 2005). Due to the similar attributes in crowdsourcing communities, researchers often use these past studies as a starting point for research and theoretical analysis.

While crowdsourcing projects and voluntary OSS production have many similarities, it is crowdsourcing's additional variable, the reward system, which continues to challenge researchers. The reward, which can be monetary (cash and prizes) and/or non-monetary (social capital) is an additional incentive presented to the crowd. Several studies indicate these incentives as being the key component that drives the crowd (Lakhani, et al. 2007) while others have shown that it plays little to no role in influencing the crowd (Brabham, 2008). An explanation to this contradiction is explained by the degree of the reward as well as the topic and purpose of the crowdsourcing project (Brabham, 2008). Simply put, the size of the reward and the topic of the project are key indicators in understanding the

motives of participants in crowdsourcing projects. These contradictory findings and vague hypothesis give need to a more substantial study behind motivating the crowd. Platform-based open innovation business models must determine an appropriate reward system to attract a healthy network of developers.

IPR: Cumulative and Collaborative Innovation

From the innovators perspective, IPR is a philosophical tenant built around the OSS tradition, which calls for free revealing of information, giving innovators the unimpeded ability to re-mix, add, subtract, and alter previous source code. To cumulatively and collaboratively innovate has long been recognized as a way for individuals to stand on the shoulders of others (Merton, 1973) and more recently has been recognized as the core concept that drives creativity and economic growth (Romer 1990, 1994; Hargadon and Sutton 1997; Aghion and Howitt 1998; Murray and O'Mahony, 2007).

One example that incorporates all of these principles is Wikipedia, the cumulative online encyclopedia. By correcting an error or adding a section to the encyclopedia, the individual (innovator) adds value (value creation). In similar fashion, this cumulative approach can be achieved in software production by the alteration of source code. This extreme form of flexible production is only possible when IP is left free and open. However, as observed previously, what makes this type of value creation successful is its inherent opposition of value capture.

From the sponsor's perspective, tight IPR control is preferred for several reasons. Teece (1986) links the ability of firms to profit from their technological innovations to the "appropriability regime for IPR". Proprietary theories of innovation treat IP "as a byproduct of innovation, and its use was primarily defensive" (Chesbrough, 2005: 14). In other words, generating and protecting IP creates competitive advantage for companies. This competitive advantage is connected (directly or indirectly) to the company's ability to generate profits. Since competitors and end-users are unable to mimic the IP due to the legal implications, it creates 'artificial scarcity' by controlling access. The scarcity creates value, which flows to the end-consumer in the form of a sale (value capture) so that the firm can recover the cost of research and development (Garnham, 1987).

Opening IP versus closing IP exposes a synthesis of economic, legal, and organizational issues concerning the innovation process and the actors within it. "Rather than just a shift in the technical production of intellectual property, open innovation reflects a transformation of how firms use and manage their IP" (West & Gallagher, 2005: 2). The degree of openness of IPR is arguably the most important, complex, and challenging architectural decisions within open innovation business models. Managing IP in open innovation is essentially a balancing act between the unfettered flexibility to innovate on the open side and the guarded proprietary control required for competitive advantage on the closed side (Simcoe, 2005). The open innovation business model's challenge is to provide external innovators, internal innovators, and sponsors with the correct IP balance to achieve successful value creation and value capture.

Perhaps Reichman (2001: 23) summarizes the complexity of the issue best:

> *How to enable entrepreneurs to appropriate the fruits of their investments in cumulative and sequential innovation without impeding follow-on innovation and without creating barriers to entry has become one of the great unsolved puzzles that the law and economics of intellectual property rights needs to address as the new millennium gets under way.*

The open innovation platform solution to this challenge is for the platform sponsor to provide digital tools and resources in the form of a Service Development Kit (SDK) to outside innovators for the development of software. Distribution of SDKs differs by various platform business models, but are either licensed or freely available to programmers under various conditions. The licensing scenario offers the sponsor with the benefit of control and/or potential license revenue. The openness of the SDK and degree in which the platform's source code is revealed varies (Timcoe, 2005).

To bring the discussion beyond the limited focus of economic theory and the legal system, organizational theory examines the role of architectural design and social factors in helping innovators to cumulatively innovate (Hansen, 1999; Fleming, 2001). Murray and O'Mahony (2007: 1017) emphasize that "cumulative innovation is constrained or enabled by the degree to which the context provides three important conditions: access, disclosure, and rewards".

- *Disclosure* – The making of ideas and knowledge available to other, but without necessarily providing them the access to use it.
- *Access* - Providing use to ideas and knowledge.

- *Rewards* - Incentive to disclose ideas and provide access.

This framework aids in the ability of open innovation researchers to "understand not just what affects flows of knowledge and ideas, but also what affects the *degree* to which innovators are able to recombine and integrate these ideas" (Murray and O'Mahony, 2007: 1017). In other words, their "framework considers how parties at multiple levels work together to enable (or stifle) the accumulation of knowledge" and "allows us to analyze any and all types of innovation" (Murray and O'Mahony, 2007: 1017). By working with this social model we can further understand how open IP actually is in open innovation business models.

Role of the Gatekeeper

An additional element of the business model in open innovation strategies is the role of the sponsor to act as a gatekeeper to filter, monitor, guide and / or "alter the informational content (for better or for worse) through active accumulation, processing and packaging" (Ballon, 2009: 228). In other words, how do outside sources of innovation flow to end-users? The more friction involved in this process, the less open. The level of friction is directly linked to the amount of editorial control the sponsor enacts over outside innovators by use of the following methods:

- *Filtering* - Decisions on what outside innovation to accept or reject.
- *Guiding* - Mechanisms provided to end-users for their own filtering process (i.e. Categorizing, recommendations, user-rating systems, user comment systems).
- *Altering* - Changing of outside innovation from what the innovator originally intended.
- *Monitoring* - Continual surveillance of all outside innovation movements.

As with most dichotomous issues, there are give-and-takes based on the degree in which the gatekeeper imposes its control over outside innovators. The filtering process exposes two concerns that sponsors must consider when making gatekeeper design decisions.

First, gatekeeper 'filtering' roles can add value for all parties to a platform, but the right balance must be struck (Ballon, 2009). For example, filtering based on quality control of incoming applications may improve the end-users overall experience and attract more end-users to a platform. Quality concerns include security issues, duplicates, malicious or

inappropriate content, invasion of privacy, and 'crapware' (Ballon, 2009). However, while this editorial control may improve a certain level of experience, issues like end-user choice will decline (Iansiti, 2009). This type of information gatekeeping is regularly used in media and communication studies to explain the effects of choosing and processing information (Shoemaker, 1996; Lewin, 1951).

Second, there are business strategies that are often considered in the filtering of outside innovation. For example, certain outside innovation, when permitted to live on a platform, may come in direct competition of a platform sponsor's proprietary product. When a sponsor rejects a competitor's outside innovation, the end-user has no choice but to be 'locked-in' to the sponsor's technology (McAllister, 2008). A recent example is the inability for third-party web browser applications to operate on Apple's iPhone platform. Presently, only Apple's proprietary browser, Safari, has the ability to operate on the platform. These types of business strategy decisions are often very complex and contextually oriented within industry settings. The important take-away is that gatekeeper design decisions often create structural asymmetries and tend to expose deeper issues of power (Ballon, 2009).

The guiding process contains the mechanisms that allow end-users to identify, determine, and distinguish one outside innovation from another. In other words, the guiding process is a platform's virtual marketplace to connect developers to platform users. The platform sponsor acts as a mediator between the outside innovations and the end-user. Mechanisms such as genre categorizing, user-rating systems, user comments, search functions, editorial suggestions, and marketing opportunities are among some of the possibilities[7].

Efficient and user-friendly systems of distribution can be of immense help to developers. The marketplace acts as a centralized search function for end-users. This helps developers reduce distribution costs and generate audiences in the hopes of generating revenue (Iansiti, 2009). These network effects add significant value for all stakeholders participating on a platform.

The architecture of the marketplace can have a more significant impact on the innovation process than one might expect. Decisions in how mechanisms act have powerful impacts on

[7] See http://www.facebook.com/apps/directory.php#/apps/directory.php?app_type=0&category=0 and iPhone app store for examples.

how outside innovations flow to the end-user. Certain gatekeeping mechanisms can lead to the focus of one application over another. For example, and in the tradition of media and communication studies, newspaper editors decide which information should be featured and which articles are less important. For obvious reasons, this has an impact on the perception of the receiver (Shoemaker, 1996; Lewin, 1951). Platform gatekeeping mechanisms are both human controlled (editorial suggestions) and computer controlled (user ratings, genre, release date, etc). Both play significant roles in the flow of information to end-users.

Conceptual Framework

This study takes an integrated approach to examining the inherent tensions involved in evolving open innovation software platform strategies. The tensions are found to be, in part, a result of the oppositional views of value creation and value capture concepts (Germany & Muralidharan, 2001). This was illustrated by contrasting OSS theory with proprietary methods of software production. By using Ballon's (2009) revised business model, it was shown how open innovation strategies need to be re-evaluated when incorporating open, value creation ecosystems. By recognizing power asymmetries and utilizing political economics of ICT design, Ballon (2009) proposes a business model that focuses on the inherent tensions of amalgamating outside innovators into a value capture business model.

In order to further tighten the framework of the research, I observed that theoretical systemization of open innovation studies is convoluted and immature. I took the opportunity to begin a classification process. First, by using Gassmann and Enkel's (2004) innovation process archetypes, I narrow my research to a 'coupled approach'. With von Hippel's (1988) external sources of innovation in mind, I further narrow the 'coupled approach' by incorporating recent phenomena of software platform theory (Iansiti, 2009: 10; Meyer & Lehnerd, 1997; Ballon, 2009).

This line of inquiry leads to the final element of the literature review for this project. First, I recognized that the incentives used to motivate third-party developers include the crowdsourcing element of the 'reward.' Second, the way in which IPR is managed influences the role of cumulative and collaborative innovation. Third, the design of gatekeeper control mechanisms plays a significant role in creating overall value for a platform. Each of these business model decisions must consider its influence on potential power asymmetries. By devising this original framework that summarizes the three business model architectural

challenges involved in open innovation platform strategies I am now able to tackle my research question.

Research Question

The goal of this research is exploratory in nature. The trend of companies implementing open innovation business models is growing. As a result, outside innovators, such as third-party developers, are gravitating towards these potentially profitable platforms. I hypothesize that many have found that power asymmetries are making it difficult to create value in the ways that they desire. Some academics, such as the Harvard Professor Jonathan Zittrain (2009), even go as far to contend that "many software developers who once would have been writing whatever they wanted for PCs are simply developing less adventurous, less subversive, less game-changing code under the watchful eyes of Facebook and Apple." Zittrain's hypothesis confirms the importance of the current research by bluntly proclaiming that platform-based open innovation strategies are inferior forms of innovation compared to previous methods such as OSS production.

These considerations lead me to formulate my primary research question: *What are the architectural design challenges in providing for the needs of outside innovators in open innovation business models?*

In parallel to my theoretical summary, I will be tackling these sub-questions:

(A) How do crowdsourcing motivation strategies affect the needs and perceptions of outside innovators?
(B) How does the management of IPR affect the needs and perceptions of outside innovators ability to cumulatively and collaboratively innovate?
(C) How do gatekeeper control mechanisms affect the needs and perceptions of outside innovators?

3. RESEARCH DESIGN AND METHODOLOGY

Rational for Method Used

The purpose of this study is to understand a phenomenon, namely the perceptions of innovators within open innovation business models by studying the opinions and self-reported practices of those involved (Kvale, 2009). While quantitative methods would contribute important generalizations of open innovation business models, this study is not meant to be "chained to group data" (Kerlinger, 1979: 270). Rather, I am interested in "the development of an understanding of the relations between relevant social actors and their situation… [and their] beliefs, attitudes, values and motivations" (Gaskell, 2003: 39). Due to the exploratory nature of this research, a qualitative, semi-structured interview method is deemed the prudent methodology.

Academic scholars have noted that innovation studies operate in Pasteur's Quadrant (Stokes, 1997), "in that the process and practices of industry actors often extend beyond the bounds predicted by academic theory" (Chesbrough, 2005: 17). This is perhaps why much research in innovation studies is heavily grounded on empirical context and case studies. For this reason, a case study was developed, which is "useful in providing additional information about the topic" (Yin, 2003:93). While this case may not be an ideal representation of all open innovation strategies, it is believed that the findings will provide insight into the wider phenomena of open innovation as a whole (Stake, 2005).

Abrahamson (1996) and Chesbrough (2005) urge scholars in the field of innovation studies to be rightly skeptical and cautious of new findings. Since newly introduced innovation frameworks and concepts are experimental in nature, the "concepts often consist of little more than fads and fashion". Also, many anomalies exist within the innovation studies and should be considered when new research is conducted (Kuhn, 1962; Feyerabend, 1981). "Scholars [should] withhold their support of these novelties, unless and until they can demonstrate a more enduring contribution to the advancement of knowledge" (Chesbrough, 2005: 5).

Many academics have observed that methodologically measuring the impact of innovation is challenging (Von Hippel, 2005; Chesbrough 2005). For instance, innovation as a definition is often contested. Some claim that it to be an innovation it requires a positive impact, while

others insist any change is adequate. Some require that the impact be economical, while others feel that it also be social or societal. Even when the disputes on definition are negotiated, quantitatively measuring the effects can be ambiguous. For these reasons, a quantitative study was ruled out in order to avoid inconclusive or vague results.

Due to the study's exploratory focus, a semi-structured interview technique was administered. Structured interviews leave less room for serendipity and would not be conducive to an empathetic approach. Completely unstructured interviews make the task of answering the research question unrealistic due to my lack of interview experience (Chadwick et al., 1984; Kvale & Brinkmann, 2009). Open-ended questions, structured around themes were developed so that interviewees could formulate answers freely and be given the opportunity to discover and present new issues (Gaskell, 2000).

Method

"For a reader who wants to evaluate the trustworthiness of the findings, to reinterpret or apply the results, information on the methodic steps of an investigation is mandatory" (Kvale & Brinkmann, 2009: 271). This insight led me to follow Kvale and Brinkmann's (2009: 102) "seven stages of an interview inquiry". The first step of this process, thematizing, has already been discussed. This section gives a detailed reflection on the operational procedures of the second, third, and fourth steps: designing, interviewing, and transcribing.

A thematic and dynamic interview guide was crafted with careful respect to the theoretical background, case study, and the research questions (Kvale & Brinkmann, 2009:131). In addition to basic background information, five main themes were initially pursued in relationship to the open innovation business model and in parallel to the my theoretical framework:

1) The innovation process
2) Motivation for participation
3) Intellectual property rights and cumulative innovation
4) The role of gatekeepers
5) Future of Open Innovation

This variation of a "funnel shaped" approach was meant as a way to begin the interview with general questions about the phenomenon and become more detailed and direct as the interview progressed (Kvale & Brinkmann, 2009: 130). These questions were formed with care to avoid leading questions and academic language (Esterberg, 2002).

After sifting through an abundant amount of open innovation literature I recognized open innovation theory lacked any coherent classification system. After narrowing the field down to more detailed characteristics I came to recognize a grouping within open innovation that incorporated software platforms. Within this class I recognized several popular examples and settled on Apple's iPhone Application Store for the case study. I concluded that this case is the best option due to its popularity and hype (both journalistic and academic) making it easier to find information and third-party developers to interview.

A convenience sample, or a selection determined "by accessibility" with the expectation of a snowball effect was the main factor in choosing interviewees (Kvale & Brinkmann, 2009). I simply contacted three iPhone developers that I have gained a friendly correspondence with and all agreed to partake in the study. Each of the three was able to recommend more iPhone developers. Through this networking I was able to contact an abundance of developers and in all, interview ten developers.

Due to the opportunistic selection of respondents, the results of this study must be generalized with caution (Kvale & Brinkmann, 2009). While the ten interviewees that I chose for this study are diverse in their views, due to the constraints of the assignment a preferred selection could not be made.

Each interviewee was in a different location around the world. Due to geographical constraints each interview was conducted online by use of the popular vocal communication software, Skype, and was digitally recorded. While this technology is convenient, the tradeoff is losing the ability to more deeply connect with the interviewee (Gillham, 2005). After completion of the interviews a word-for-word transcription of one recording was made through a word processor.

All standard ethical procedures were followed and largely focused around the issue of consent (Gillham 2005). I asked each interviewees permission to record the interview and to later transcribe what was said so that it could be used in the study. All ten interviewees

agreed to full consent. After reviewing Kvale and Brinkmann's (2009) ethical guidelines and the "LSE Research Ethics Policy" no other ethical or moral issues were cited.

As each interview began, I gave "a briefing" of the project (Kvale & Brinkmann, 2009: 128). In coherence with the semi-structured interview, the interview guide was generally followed based on my exploratory judgment. As recommended by Kvale & Brinkmann (2009) follow-up, specifying, interpreting and probing questions were all employed during each interview with the aim of knowledge discovery. The interviews varied from forty-five minutes to one hour. During each interview I felt the pressure of time and the desire to acquire more information (Flick, 2002).

Analysis and Findings

As recommended by Kvale & Brinkmann (2009), the analysis of interviews is ongoing from "the preparation of the interview guide, the interview process, and the transcription of the interviews" (190).

Kvale & Brinkmann's (2009:190) "Six Steps of Analysis" begins with the interview itself. Therefore, I was particularly focused on observing the interviewees' (1) descriptions and (2) discoveries in order to (3) condense and interpret meaning during the process. This "co-authored" interview technique is a type of "as you go" analysis that, if done appropriately, "may serve as a methodological ideal for interview research" (Kvale & Brinkmann, 2009:190,192). In other words, the interview itself is a form of analysis.

The fourth step is comprised of the post-interview analysis of the interviews. "Many analyses of interviews… rest on a general reading of the interview texts with theoretically informed interpretations" (Kvale & Brinkmann, 2009: 233). However, due to my lack of experience I felt it necessary to use the analytical tool of "meaning condensation" combined with my theoretically informed interpretations to gather and interpret the knowledge acquired (Kvale & Brinkmann, 2009: 207).

I began by reading through the transcripts and listening to each interview several times to get "a sense of the whole" (Kvale & Brinkmann, 2009:207), which gave me a general comfort for the knowledge gathered. Next, "the natural 'meaning units' of the text [and recordings] were determined" (Kvale & Brinkmann, 2009:207). This is a way of translating

meaning into a condensed understanding, which is particularly helpful when large amounts of text are present.

Next, with use of 'meaning units', transcripts were assessed in a thematic analysis of which "the quest is for common content themes and the function of these themes" (Gaskell, 2000: 53). Due to the study's detailed preparation, I was easily able to organize meaning units into themes that directly parallel the theoretical framework that I devised: Motivations, IPR, and Gatekeeper Roles. These themes were closely scrutinized "in terms of the specific purpose of the study" (Kvale & Brinkmann, 2009:207). In other words, the content under each theme was directly related back to the theoretical principles and research question. Finally, "the essential, nonredundant themes of the entire interview are tied together into a descriptive statement" (Kvale & Brinkmann, 2009:207), which is explained in the following sections.

4. RESULTS AND INTERPRETATION

I begin the results and interpretation section with a basic introduction of Apple's iPhone application store. After, each of my research questions stated at the end of the literature review will be addressed in turn, with reference to my major findings.

Case Study Introduction: iPhone Platform

The iPhone is a multi-function, bundled device consisting of phone, media management, camera, Internet connection, touchscreen, and software platform capabilities. While the physical iPhone is impressive, it is the iPhone's open software platform (the app store) that has received the most attention. The app store was not introduced until 2008 and is now hugely popular. By releasing SDK packages, Apple gives developers the opportunity to create and distribute their own applications specifically designed for the iPhone. Developers range from large software companies to individuals working from their homes. To date thousands of developers have created over 65,000 applications available to iPhone owners (Ankur, 2009). End-users have downloaded 1.5 billion applications spending an estimated total 500 million US dollars (Siegler, 2009). In a short time, the app store has become a significant business success.

Motivations: Crowdsourcing

(A) How do crowdsourcing motivation strategies affect the needs and perceptions of outside innovators?

Case Study

Apple's incentive structure for developers is built upon a unique reward system. Developers are free to set any price for the application they create. The applications are submitted to Apple and after an approval process are sent to a virtual marketplace where developers compete over end-users. Apple takes 30% of each application sale to cover hosting, marketing, and credit card fees. The more application purchases, the larger the reward for the developer.

Findings

Most insight into the motivations for participating in open innovation projects was consistent with the literature review on crowdsourcing. The interviews summarize this point succinctly:

> *"It's all about the money. If anyone tells you different, they are lying"* (Developer #4).
> *"While I enjoy what I do, this has turned into my career. It's important that any idea I pursue, has a good chance to make money"* (Developer #5).

After the first several interviews confirmed that the reward drives iPhone developers, I refocused the interview guide based on a suspicion. I began to question the preconditions necessary for participants to even consider chasing the reward. It was found that crowdsourcing theory makes some rather bold assumptions: (1) a reward is predetermined and (2) a community of knowledgeable participants already exists.

First, crowdsourcing assumes that the reward is predetermined. For example, innocentive.com gives predetermined cash rewards to the first participant to solve a particular problem. Platform-based open innovation business models frame the reward differently. The crowdsourcing task poses that the participants create any particular software application to be distributed to end-users. However, what is unique about this crowdsourcing method is that the reward does not come directly from the sponsor, but instead is determined by the end-users in the form of a purchase. Each developer's software application is bidding for customers. Therefore, the size of the reward is determined by the

popularity of the application. This also means that the overall popularity of the platform (the population of end-users) sets the limit for the possible rewards each application can receive. The largest possible reward is equal to every end-user on the platform purchasing your application.

Ballon (2009) emphasizes that the platform sponsor needs to make sure "the pie" is expanding for everyone. For this reason, almost all interviewees cited growing success of the iPhone network as being a decisive factor to their participation. This almost always included a comment on the "coolness" of the platform, which is a testament to the platforms ability to attract a thriving network and ensure increasing rewards for crowdsourcing participants.

> *"One reason I decided to program for the iPhone is because I bought one and thought it was really cool. I figured more people would think it was cool and want to discover what it could do. So I started to develop"* (Developer #4).

> *"The iPhone is such a cool device. Everyone wants one because of what it can do and what it might one day be able to do. It's an evolving platform"* (Developer #7).

Even more fascinating is the "virtuous cycle" that arises in which both developer and end-user "reinforce each other continuously". This "synergetic effect can be said to exist if the combination of value elements leads to network externalities on the supply side and the demand side" (Ballon, 2009: 312). In other words, more applications attract more users and the more users mean a larger potential reward for developers.

> *"Every time I hear a new stat about how many iPhones have been sold I think that is just another potential person that can buy one of my apps. It gets me excited to keep working" (Developer #4).*

The second assumption crowdsourcing theory makes is that a community of knowledgeable participants already exists. For example, innocentive.com markets to a pool of talent that have the required knowledge to begin the problem solving process. However, many platforms are newly developed technologies and are being introduced to outside innovators for the first time. Learning new techniques can often involve challenging learning curves that ultimately might turn an individual away from participating. Crowdsourcing theory

neglects this precondition. Open platforms need to incorporate this into their business models if they want to attract a critical mass of developers.

> *"I started learning from scratch without any programming background although I doubt it would have mattered. It's a new way of coding. Apple provides you with a great starting off point online that gets the ball rolling. After that I was able to find video lessons and other tutorials from an online community of iPhone developers"* (Interviewee #5).

After conducting an extensive online search for iPhone application learning resources it was found that not only do an abundance of tutorials and instructions exist for developers to learn new skills, but also there is a mature community of helpful and knowledgeable developers. This is interesting because they contain similar altruistic characteristics as OSS communities. Perhaps interviewee #3 summarizes the concept best,

> *"No one is going to write an app for you, but we definitely help each other out. While we are competitors, we rarely think of each other as competitors when it comes to coding. Coming up with the idea is the hardest part. We're all in it together when it comes to implementation".*

Since all developers are essentially competing against each other, the findings came somewhat as a surprise and the phenomenon deserves further research.

IPR: Cumulative and Collaborative Innovation

(B) How does the management of IPR affect the needs and perceptions of outside innovators ability to cumulatively and collaboratively innovate?

Case Study

Apple manages its IPR in a far more closed manner than other open platforms. As mentioned previously, Apple releases an SDK package for developers. These are tools provided proprietarily by Apple. Apple charges each developer $99 a year to distribute applications with the use of the SDK package. In using the SDK, developers are contractually bound to a set of terms and conditions (Registered iPhone Developer Agreement). One critical term and condition is that developers are unable to release an

application under a 'free software' license[8]. In other words, developers cannot publicly release source code and therefore, "no one could alter your source code and run the modified result on their phone" (Willis, 2008). In addition, you must agree not to "disclose, publish, or disseminate" any of the "aforementioned confidential information", and not use it "in any way, including, without limitation, for your own or any third party's benefit without the prior written approval of an authorized representative of Apple in each instance" (Registered iPhone Developer Agreement). An obvious power asymmetry is present.

Findings

How does the iPhone platform match up to Murray and O'Mahony's (2007) framework for enabling cumulative and collaborative innovation (degree of disclosure, access, and rewards)? Well, not very good, but there are two IP relationships that need analyzing:

(1) Apple and Developer
(2) Developer and Developer.

First, the IP relationship between Apple and the developer is analyzed. Apple is moderately open when it comes to disclosing their proprietary innovations to developers. While there are many technical aspects of the iPhone that are not disclosed, the SDK provides developers with the majority of what the iPhone is capable of doing at that given point. Apple gives relatively frictionless access to use of the SDK. However, Apple's degree of access to the SDK only goes one step. Apple does not allow combining outside innovations or even alterations to the SDK. This limits the boundaries of cumulative and collaborative innovation drastically. In comparison, OSS sets no boundaries to the extent of experimentation. Finally, Apple has a successful reward system that was explored in the previous crowdsourcing section.

The second and more interesting way to look at this is from the point of view of the developer community. On the surface, it looks as though the conditions for cumulative and collaborative innovation between third-party developers do not exist at all. Developers are contractually not permitted to publicly release source code. So publicly, developers do not have disclosure or access to other developers' innovations. The perceptions of developers

[8] 'Free software' licenses resemble the IP structure of OSS communities. Therefore, proponents of OSS communities condemn the iPhone platform for its approach to IPR (Willis, 2008).

interviewed varied greatly in respect to how Apple managed this portion of IP. From these perceptions, several interesting discoveries and observations were made.

First, as organizational theory emphasizes, we must go beyond the economic and legal system when observing systems of cumulative and collaborative innovation (Hansen, 1999; Fleming, 2001). This led me to observe that developers find creative ways to cumulatively innovate among each other. One developer explains:

> *"Yeah, we can't use each others source code freely, but privately we can make any deals we want… Good example is that recently, I wanted to add something more complex to one of my games… The idea was based off another developers game so instead of making it ourselves, we decided to contact the other developer… In exchange for their source code, we offered to promote and market their app. It's turned out to be a great partnership"* (Interviewee #7).

Here, a form of collaborative innovation is taking place enabled by social interaction. While the legal system stifles accumulation, developers are discovering workarounds. In this situation, disclosure, access, and rewards are taking place, but in a traditional marketplace setting. While degree of these preconditions will differ with each situation and proponents of free software discount this as a legitimate form of cumulative innovation (Willis, 2008), the fact remains that source code is being reused. Source code is being disclosed, accessed, and rewards distributed based on the context of each individual trade.

Other Alternatives

To conclude this section, it was found that developers participating in Apple's iPhone platform are generally passive to the management of IPR. Developers seem accepting of the limitations because of the success of the platform. In other words, the rewards are significant enough that developers are willing to operate under a tightly controlled IPR regime. As long as the business model supports a satisfied network of all parties involved, the innovators will innovate under whatever restrictions are given to them. This relates back to the virtual cycle concept from last section and can also lead to a 'lock-in' concept for developers. Even if another system is deemed to be better, the strength of the network value may keep them from participating elsewhere.

> *"Sure there is more flexibility and potential to create cool things in the Cydia[9] community, but there isn't even close to enough people in the marketplace. Until more people start going to Cydia it would be impossible to make a living"* (Developer #9).

If the only aim were value capture then the above might be seen as a positive externality. However, the open innovation business model also emphasizes and provides for value creation. While the strength of the network has the ability to increase platform value capture, this situation is seen as limiting the potential of what the platform could innovatively achieve.

Role of the Gatekeeper

(C) How do gatekeeper control mechanisms affect the needs and perceptions of outside innovators?

Case Study

The iPhone application store aims to provide third-party developers with a virtual marketplace for end-users. Apple's website emphasizes, "Browse the App Store in categories from games to business, education to entertainment, finance to fitness. New applications from world-class developers arrive every day" (Apple Inc, 2009). In 2008, when the app store was introduced it simply took on similar design elements to the already established iTunes music and movie store. Appendix A shows a snapshot of what the marketplace looks like at any given moment. The applications highlighted at the top are paid marketing spots. The other various modules highlight 'categories', 'top downloaded applications', and 'staff favorites,' which represents editorial picks.

By clicking on any of the applications you are brought to the individual application homepage (Appendix B). Here, you can download the application, get application descriptions, view customer ratings, and view customer comments.

[9] Cydia is an underground marketplace for iPhone apps. The Cydia community has few IP restrictions and is seen as a friendlier place for developers. Apple claims that Cydia is an illegal renegade community. For further information see < http://cydia.saurik.com/>

Findings

Several important findings were made based on Ballon's (2009: 224) proposal that if research into open innovation business models is to take into "account power relations and structural asymmetries, it needs to consider asymmetric capabilities deriving from *controlling* a specific position within the value network and/or a specific subsystem within the functional architecture". By investigating innovators perceptions and reactions to gatekeeper roles of control I found two re-occurring themes that are often overlooked in theoretical analysis.

First, the idea that the overall gatekeeper design can be a source of value was consistent with theory. Developers believe that a well-balanced gatekeeper can add significant value to a platform, while an unbalanced architecture can deter developers and end-users from participating. While most interviewees cite specific issues, their overall assessment of the gatekeeper role is positive. They felt that Apple's control and editorial decisions could be fairer to developers, but were adequate enough to add significant value.

> *"They do it better than anyone else. I'm often confused and annoyed by how other platform sell third-party applications. It's definitely a turn-off. The app store is by far the most user-friendly of the marketplaces. I think this attracts and retains customers… And I guess for me, I'm able to easily search the store to see if an idea has been done before"* (Developer #7).

While the overall rating seemed positive, after further investigation I discovered that Apple's filtering process lacks transparency. While most developers see the benefit in a filtering process to improve the quality of incoming innovations, every developer I talked to was visibly frustrated by the lack of a visible criteria and explanation.

> *"I understand why they reject apps. We don't want an abundance of crap. But I don't understand why they can't clearly tell us why something is approved or rejected"* (Developer #4).
>
> *"Only one of my apps have been denied. My main frustration is that I don't know why it was denied. Maybe if a more comprehensive reason was given I would at least be a bit more at ease… It makes me more hesitant to attempt risky ideas in the future. I can't afford putting valuable time into developing if Apple is going to turn around and deny me. It's sometimes not worth the risk"* (Developer #1).

Here, the negative perception that developer #1 has towards Apple leads to a loss of value for the platform. Developer #1 becomes so disempowered that he balks when considering future innovation and platform contribution. He emphasizes that if transparency existed he would have a better indication of what he should or should not do. As mentioned before,

the new business model design relies on the satisfaction of all parties involved. When one party fails to be satisfied, the business model can falter.

The gatekeeper guiding principles were found to play a far more important role in the innovation process than originally hypothesized. One particular finding became the focus during a conversation with developer #3. The conversation rotated around the motivations behind continual innovation and improvements to applications already being sold in the marketplace. When developers improve an application, previous purchasers must download the new version from the store again, free of charge. As a result of receiving a higher number of downloads, the application receives more attention on the store. For example, many apps move into the 'top paid apps' section on the right hand column of the homepage even if they are only updating the product (see Appendix A). This highlights the app and attracts new customers that otherwise would not have recognized the app.

This observation leads to two further observations. One, this particular design element gives developers an incentive to improve their own innovations and in theory increases the overall value of platforms. However, the second observation came with the discovery of how developers have learned to use this marketplace design element as a strategic advantage. In particular, one developer said,

> "I have learned to stagger my releases. The initial offering never includes everything that will eventually include in the app. I purposively wait to add certain features so that I can take advantage of the update process. This gives me a leg up against the competition" (Developer #2)

The original intention of this marketplace design was to inspire improved innovation and added value to the platform. However, developers have discovered ways to exploit its intended function. As a result, the innovation process does not reach its potential. This finding exposes just one of potentially many marketplace design decision that should be considered when developing a business model. Further research is necessary to uncover more interesting design elements.

5. CONCLUSION

This paper has sought to empirically explore the theoretical literature of open innovation strategies incorporating platform-based business models from the perspective of the outside innovator. One significant complication in writing the paper was finding an appropriate framework that summarized the inherent challenges of open innovation platform-based business models. After exhaustive research it was found that open innovation was lacking a systematic classification system. In order to answer my research question, I deemed it necessary to create my own framework. However, while the theoretical framework may be seen as an advancement in systemizing open innovation, due to the scope of the assignment it was developed in a rudimentary fashion. Further theoretical analysis is necessary to provide a complete illustration of the phenomenon. The more evidence that can be provided, the stronger the framework will become.

After overcoming this significant challenge, I was able to broach the research questions at hand by conducting in-depth interviews with third-party developers participating on the iPhone platform. I found that from the perspective of developers, open innovation business models could significantly bridge the gap between value creation and value capture. By allowing for outside innovators to flexibly create for a corporate sponsored platform, outside value creation can efficiently and effectively be captured by managing and balancing the following three aspects: motivations, IPR, and gatekeeper roles.

It was also found that these platform design decisions could affect its innovators in both positive and negative fashions. When done with the consideration of all parties involved, business models can add significant value to the innovation process by combining the strengths of value creation with the strengths of value capture. However, increasingly beneficial reward systems often blind innovators from the lack of transparency, controlling design mechanisms, and controversial business strategies that have the ability to lead to backward-thinking processes for innovators and a decrease in value for the open innovation platform. It was found that decreases in platform value were often due to the platform sponsor's centralized decision-making ability resulting in power asymmetries within the business model. Corporate sponsors must always be mindful that value creation is just as essential a principle as value capture in the open innovation business model if outside innovators are to be satisfied.

However, despite the evidence provided by this paper, the scope and speed of companies implementing open innovation has left many phenomena and abnormalities within the field unexplained. While many business strategists, economists, and management schools are extensively covering the fields swift evolution with the aim of making sense of value capture techniques, few fields are exploring the systems impact on topics such as power relations, social interactions, cultural effects, and public policy implications. After the recent barrage of successful implementations, it is apparent that open innovation is here to stay. It is time for social scientists to refocus attention to how open innovations affects aspects of society.

In conclusion, while the day of requiring millions of dollars to finance complex research and development innovations will probably always exist on some level, the ability for the average citizen in a modern society to create powerful and influential innovations is upon us. Take the case study as example to this unique situation. The iPhone took a significant amount of corporate resources and finances to develop. However, the result has spawned a unique ecosystem of independent innovators that are developing far more powerful creations than Apple ever expected. Bill Gates, founder of Microsoft, at the dawn of the software revolution is known to have said, "never before in history has innovation offered promise of so much to so many in so short a time". Perhaps now, with innovation coming from the most unexpected places, his comments will ring louder than ever.

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Appendix A: App Store Home Page Example

(Apple Inc, 2009)

Appendix B: Individual Application Home Page Example

(Apple Inc, 2009)

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