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HOW ARE HYBRID OPEN SOURCE FIRMS' PRODUCTS COMMERCIALY SUCCESSFUL?

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ABSTRACT

Worldwide, software is a multi-billion dollar industry. Firms in this industry are adopting novel business models to increase growth. One such business model is the hybrid Open Source Software (OSS) model. There is a growing body of research on OSS business models however little research has looked at the hybrid OSS model. This research-in-progress attempts to shed light on the hybrid OSS product success through the lens of transaction cost economics. Drawing on previous research on software development and OSS, a model of hybrid OSS is proposed. The key contribution of this work will be to more fully understand hybrid OSS firms, the OSS communities of which the firms are a part, and the customers of the hybrid OSS firm.

Keywords

open source software, transaction cost economics, hybrid business models, commercial open source

INTRODUCTION

The software publishing industry is a growing industry. By the year 2014, revenue for the software publishing industry will be over \$196 billion worldwide (Kahn, 2013). This represents a large opportunity for firms. One method of competing in the software market is by using open source software (OSS). Fitzgerald (2006) said that OSS has fundamentally changed from an informal collection of individuals who wrote code for reputation to a development style driven by formal controls. Firms sometimes drives this reorganization. By integrating OSS with proprietary components, hybrid OSS solutions are created. For example, IBM sells a product called IBM Rational Application Developer (RAD). RAD is based on the OSS project named Eclipse. As a mix of OSS and proprietary components, RAD present opportunities and risks to IBM's potential profitability. IBM doesn't bare 100% of the total cost of software development but they lose some secrecy of their product's roadmap. IBM has to adopt a hybrid business model that takes in account OSS rules, OSS norms and IBM's goals. While previous literature has studied hybrid business models, there is little to no attention given to commercial success of OSS product from the hybrid firm. This research will address the question: *how do hybrid OSS firms make a profit with OSS?* Transaction cost economics (TCE) can be used to explain how a hybrid OSS firm can lower transaction costs when creating and selling OSS as a product. These lower transaction costs should lead to OSS product success. This research in progress will review the literature of OSS product success, hybrid OSS and hybrid business models and transaction cost economics. Then, I will then propose a model based on previous theories, propose a methodology, discuss limitations and discuss contributions.

REVIEW OF LITERATURE

Open Source Software Product Success

OSS is slowing becoming more mainstream both in research and practice. OSS started as a way for software developers to fix their own software problems and share the results with a larger community (Raymond, 2001). OSS is software that allow for the free redistribution of source code and varying rights for distribution of modifications to the source code (Chengalur-Smith et al., 2010; Stewart et al., 2006). A typical OSS project is made up of a team of developers and contributors that are organized around creating or enhancing software (Chengalur-Smith et al., 2010; Sharma et al., 2002). Previous literature has equated OSS project success with OSS product success. In order to manage source code for a software project, organizations use source code management systems. Among other tasks, these systems manage commits. A commit is when a developer adds their changes to the source library (Grewal et al., 2006). Although a characteristic of the software product, the software commit has been used as a proxy for how fast knowledge is created (Singh et al., 2011) in and the technical accomplishment (Grewal et al., 2006) of an OSS project. Downloads are the number of times a particular software is copied from the OSS project to another computer. This OSS product description has been used to gauge an important characteristic of OSS project success, user interest (Subramaniam et al., 2009). Since OSS project continuation is based voluntarism (Fang and Neufeld, 2009), the lack of user interest means that there could be less motivation for developers to continue to work on the project (Chengalur-Smith et al., 2010).

Hybrid Open Source Software and Hybrid Business Models

Hybrid OSS is software sold by firms that contain software governed under both OSS and non-OSS licenses. Commercial firms must create a hybrid business model for OSS that balances OSS community expectations and firm owners' expectations of profitability (Bonaccorsi et al., 2006; Sharma et al., 2002). In examining an OSS firm, OpenBravo ERP, Deodhar, Saxena, Gupta and Ruohonen (2012) found that the Chief Technology Officer hired a community manager that was respected in the OSS community as a whole. The community manager not only managed the community but also help OpenBravo ERP get a "very community friendly culture within the company" (Deodhar et al., 2012, p. 288). The authors found five practices of an OSS firm to be different from a proprietary firm. Four out of the five practices are directly aimed creating a stronger more vibrant community outside the firm: (1) maintaining differences between community and non-community software, (2) integrating the community with internal product development, (3) giving the community code important updates, and (4) an open product development platform. Prior research does not make an open source versus proprietary source distinction of the fifth practice, freedom to develop proprietary extensions (Smolander et al., 2008). Sharma et al. (2002) found that the structure, culture and process is different between the OSS community and firms. Structurally, firms are formal and have well-defined organizational boundaries whereas OSS communities are informal and have poorly defined organizational boundaries. Culturally, most of the OSS communities' communication is via computers and information is shared with all members of the OSS community. OSS developer cultural values have been found to affect communication quality, cognitive trust, and team effort (Stewart and Gosain, 2006). In a traditional firm, most of a firm's communication is done face to face and information is shared on a need to know basis (Sharma et al., 2002). Sharma et al. (2002) also found that OSS communities use self-governance mechanisms such as membership management and sanctions to allow anyone to join but also to enforce compliance with community rules. Firms rely on management to make membership and compliance (hire\transfer\fire) decisions. The authors found these differences can be mediated by the hybrid OSS firm adopting transitional changes to its structure (having permeable, but governed, boundaries), culture (facilitate more decentralized rule creation) and process (encouragement of electronic communication). Despite this literature, there is little to no research that looks at which aspects of a hybrid OSS business model factor into a hybrid OSS firm's product success.

The previously discussed research has measured OSS hybrid firm success on the same measures as OSS project and OSS product success. Although these are important, they ignore the realities of a profit driven firm. Little to no research has been done that tries to explain the relationship between OSS hybrid firm and paying customers. When organizations or individuals come together to exchange goods and services, a transaction is created (Coase, 1937).

Transaction Cost Economics

Transaction Cost Economics (TCE) states that when firms attempt to exchange goods and services with each other, there are extra costs that have to be paid in addition to the cost of the goods or services being exchanged (Coase, 1937). These costs are called transaction costs. TCE makes two assumptions about human behavior during these transactions: bounded rationality and opportunism (Rindfleisch and Heide, 1997). These assumptions about human behavior introduce transaction costs to a transaction (Grover and Malhotra, 2003). There are two facets to transactions: asset specificity and uncertainty (Rindfleisch and Heide, 1997). Asset specificity and uncertainty are critical to understanding profitability of the hybrid OSS business model.

Asset specificity

Asset specificity is how transferable an asset is that support a transaction (Rindfleisch and Heide, 1997). In particular, brand name capital is of interest for this research. Brand name capital is how transferable the thoughts about a brand are to the products or franchisee of the firm (Fladmoe-Lindquist and Jacque, 1995). Firms are now using combining their brands with OSS brands as a part of their marketing (Fitzgerald, 2006).

Uncertainty

Uncertainty are the known changes that can come out of a transaction (Rindfleisch and Heide, 1997). In dealing with OSS hybrid firms, intellectual property and legal uncertainty continue to be a concern of customers (Fitzgerald, 2006; Shah, 2006).

THEORY DEVELOPMENT

This research looks at the how the relationship with the developers and the paying customers inherent to an OSS firm leads to OSS product success, mediated by the customer's perceived transaction cost and the firm's actual transaction cost of being hybrid. The unique challenges faced by a hybrid OSS firm can also be a benefit if they are not too great. The challenges are captured and measured by the transaction costs mediators. The research model guiding this study is given in Figure 1.

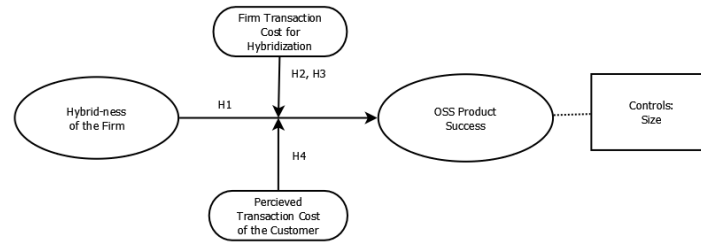


Figure 1. Model of Hybrid OSS Product Success

Hybrid-ness of the Firm

A hybrid OSS firm can be described by the nature of its relationships with three groups, developers, community members and paying customers (Deodhar et al., 2012; Shah, 2006).

Firm Relationship with Developers

This will measure how close to the hybrid OSS principles the firm treats the developers. One measure of this will be how work is assigned. At a pure OSS firm, it will be community based. At a non-OSS firm it will be assigned from the management. At a hybrid OSS firm it will be assigned by using knowledge-based task assignment (Sharma et al., 2002).

Firm Relationship with Community Members

Community members are defined as anyone who uses the software from the firm or community without paying for it. Previous research has defined these users as being dependent on informal support, wanting a production-ready software (Deodhar et al., 2012), having access to the source code (Deodhar et al., 2012; Sen, 2007), and typically not needing code (Sen, 2007). There are three measure of a strength of a hybrid OSS firm's relationship with the OSS community: (1) the amount of community building, (2) the fairness of community governance, and (3) the donation of infrastructure to the OSS community (Sharma et al., 2002).

Firm Relationship with Customers

There is little to no to existing research on the nature of the relationship of hybrid OSS firms and their customers. Zeithaml (1996) has found that service quality leads to firm performance. Service quality measurement will be used to verify the relationship with customers.

OSS Product Success

OSS product success can be broken into pre-release activities (Grewal et al., 2006), post-release activities (Grewal et al., 2006) and financial indicators (Deodhar et al., 2012).

Pre-release Activities

Previous research has found that the source code commits (Grewal et al., 2006; Singh et al., 2011) is pre-release activities that lead to OSS product success.

Post-release Activities

The number of downloads is a post-release activity that has been measured to show an OSS product is complete to a point of usability, activity and popularity (Grewal et al., 2006).

Financial Indicators

There is little research on the financial indicators for OSS firms. However previous research has indicated that sales have been used for proxies of firm performance (DeLone and McLean, 1992). Since the hybrid-ness of a hybrid OSS firm influences how successful an OSS product can be,

H1: OSS hybrid-ness of a firm will lead to OSS commercial success.

Firm Transaction Cost for Hybridization

Deodhar et al. (2012) found that some firms have to learn over time how to be a hybrid OSS firm. There is a transition that firms have to go through in order to be successful as an OSS firm (Bonaccorsi et al., 2006; Sharma et al., 2002). In most cases, it is easier to find business experience in proprietary software than business experience in pure OSS or hybrid OSS. For firms that are new to selling OSS, there will be a high human asset specificity because of the unique nature of building and selling OSS. As found by Deodhar et al. (2012), hybrid OSS firms are managed by former proprietary firm employees. Trying to create “the right pedigree” could have slowed down innovation and effected sales negatively (Deodhar et al., 2012, p. 288). Therefore,

H2: Transaction costs associated with being a hybrid firm will weaken the relationship between OSS hybrid-ness and OSS commercial success for firms new to OSS.

H3: Transaction costs associated with being a hybrid firm will strengthen the relationship between OSS hybrid-ness and OSS commercial success for firms with experience in OSS.

Perceived Transaction Cost of the Customer

Transaction costs have been shown in previous research to influence change the value of a good and increase firm performance. By focusing on delivering transactions efficiently, e-businesses can bring value to the customer (Amit and Zott, 2001). The authors found that e-businesses can reduce transaction costs by giving customers comprehensive information (reducing search costs, bargaining costs and opportunistic behavior), access to virtual markets (better customer decision making), and simplifying orders (reduce mistakes which reduces contract monitoring cost). An OSS firm should be able to lower these costs for their customers. Transaction costs identified by the literature for OSS firms are the increased legal scrutiny of OSS licenses (Shah, 2006) and brand name capital (Fitzgerald, 2006; Fosfuri et al., 2008; Stewart et al., 2006).

H4: The amount of the perceived transaction costs of the customer will strengthen the relationship between OSS hybrid-ness and OSS commercial success.

Controls

Size

Firm size is a commonly used control variable in firm level students. Since OSS firms may be of varying sizes, this study will control for firm size.

PROPOSED METHODOLOGY

A survey of hybrid OSS firms will be conducted to test the proposed model. To identify these hybrid OSS firms, a comprehensive search OSS firms will be conducted. A detailed search through publicly available databases such as the Security Exchange Commission, PrivCo and Lexis Nexus will be performed to identify firms that list OSS as a product. After compiling the list, I will identify managers at these firms with similar responsibilities as Deodhar et al. (2012) with the addition of community-based leaders and sales representatives and contact them to take the survey.

CONCLUSION

Expected Limitations

This research postulates that the firm’s customers, community members, and developers contribute to its hybrid-ness. It could be that in addition, a hybrid OSS firm has a unique relationship with customers and the OSS community regardless of the firm’s hybrid-ness. The research relies completely on quantitative research. Venkatesh, Brown, and Bala (2013) called for an increase in IS articles that use a mixed-methods approach. I believe that this topic could be a prime candidate for such research. As demonstrated by Deodhar et al. (2012), qualitative data can provide a richness not found in quantitative data. The lack of qualitative in the research hampers its extendibility and completeness.

Expected Contribution to Research

Primarily, this research fills the gap in how firms with hybrid OSS business models are profitable. Researchers will now have a greater understanding on the dynamics of how hybrid firm OSS operators in relation to its customers. The concept of openness extends beyond software to hardware (Pearce, 2012). These constructs can be used as a basis to understand how success is possible.

Expected Contribution to Practice

What started as a loose group of engineers grew into a populist anti-Microsoft movement (Raymond, 2001), OSS and commercial OSS is now being embraced by Microsoft (Fitzgerald, 2006). For firms that don't sell OSS, this research can be used as a guide against competitors that sell OSS. For those firms that sell OSS, this can show how they can provide value although the software is available as a low cost or no cost download. For managers interested in pursue a hybrid strategy, this research shows the necessary transaction cost the firm must be willing to pay in order to be successful.

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