



Creating Value through Business Models in Open Source Software

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Creating Value through Business Models in Open Source Software

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ABSTRACT

This paper explores how the use of a business model enables value creation in an Open Source Software (OSS) environment. Open Source offers one possibility for firms that are continuously looking for new opportunities and ways of organizing their business activities to increase the amount of value they can appropriate through their capabilities. The authors argue that this value can be attained by analysing value creation logic and the elements of business models. They demonstrate how value is created through business model elements and provide a list of questions that can help managers in their considerations with Open Source Software.

Keywords: Business Models, Open Source Software (OSS), Organization, OSS Context, Value Creation Logic

INTRODUCTION

Firms have recognized an increasing need to improve their ability to change the way their business operations are organized. Thus, they assess new business opportunities and evaluate them in terms of whether they would suit the firm's business portfolio. A business

model is considered a tool for exploring new business ideas and capturing the essential elements of each alternative. It is a construct for mediating technologies' development and economic value creation; in other words, it is an abstract representation of the business logic of a company. Open Source (OS) is a phenomenon that almost every company

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has encountered in the last ten years. It offers opportunities for the creation of new business and, thus, exploring the types of alternatives it may offer for value creation is a subject of growing interest.

We begin the paper with a brief review of the discussion on value creation and business models. The ideas thus presented concerning value creation and business models are applied and analysed in the special context of the Open Source Software (OSS) environment. We argue that a general business model typical of a proprietary software business is also applicable in the context of OSS. However, in the OSS context, the elements of such a business model appear altered and are implemented in a different way than in a proprietary software business. One reason for this is that the value created in an OSS project often cannot be owned by single companies. This argument as to the differences between OSS and proprietary software business forms the starting point of our analysis and has been taken into account throughout the paper.

The objective of this paper is to explore how the use of a business model enables value creation within the OSS environment. We argue that this value can be attained by analysing value creation logic and the elements of business models, as profitable business is all about creating value and capturing it properly. Firms are continuously looking for new opportunities and ways of organizing their business activities to increase the amount of value they appropriate via their capabilities. Open Source may offer one possibility for this.

BACKGROUND

Differences between Proprietary and Open Source Software in Business

The three most salient points separating proprietary and OS software are (1) Open Source and licences, (2) networks and their actors and (3) the customer. Firstly, difference emerges from the openness of source code and licences. Open Source code enables anyone to further develop the original code, and the terms of the licence ensure that the will of the original developer holds. The code can be obtained and improved by anyone with the right skills (Woods & Guliani, 2005). With proprietary software, on the other hand, the source code is not made publicly available and typical licences restrict the utilization of the source code to the commercial supplier of the software only.

Secondly, the openness and availability of the source code means that the value in Open Source projects is created for the network, not for individual companies, other entities or individuals. The business models of the companies involved in Open Source Software projects should be linked to the business models of the other network actors, and perhaps include some components outside the network. Thus, the management of network relationships has a key role in Open Source business (Dahlander & Magnusson, 2005; West & Gallagher, 2006). The idea is that by openly sharing the software code with others, each actor can perform the parts it is best at,

and thus the cooperative effort's outcome is characterized by high quality. When all actors have the opportunity focus on their core competencies, the development work feels easy, fun and rewarding (Torvalds, 2001). A noteworthy feature of OSS is that the knowledge to create the product is not in the hands of firms but resides within different actors outside of the firm. One challenge in effective utilization of this knowledge is that actors involved in OSS networks sometimes have very contradictory intentions and expectations (lately e.g. crowdsourcing activities, see Afuah & Tucci, 2012). For example, firms are often more focused on capturing monetary value, while many coders may find other sources of motivation (see Mikkonen et al., 2007).

Thirdly, the role of the customer in the OSS environment is rarely clear when attempting to create value for the end customer. In principle, all software coders can be seen as customers, since they develop software also for their own use. It is often claimed that an Open Source project starts "by scratching a developer's personal itch" (Raymond, 2000). Apart from that, the coders seldom think in terms of specific customers for their projects; instead, all who want to utilize their software are free to do so. Thus, customer segmentation, while a typical consideration in proprietary software business networks, is not considered in OSS communities. A more detailed analysis of these differences can be found in the work of Kooths et al. (2003, pp. 74–79) as well as Lerner and Tirole (2004), who reviewed the multidimensional nature of the differences between the

proprietary and Open Source approach to the software business. Bonaccorsi et al. (2006) showed that OSS firms have chosen a hybrid business model (mixing products, types of licenses, and sources of revenues) by combining the offering of proprietary and OSS under different licenses. Further, they suggest that both open and closed business models can exist in the market, given that firms calibrate their openness with respect to their customer base and product/service portfolios. This notion emphasizes how OS business models complement – not solely substitute – the closed offering business model. Walli (2006, p.126) has suggested how an ecosystem approach (see e.g. Mäkinen & Dedeheyir, 2013) may complements a firm's offering in solving its customers' problems.

Perspectives on Value Creation

In this section, value creation is discussed from a monetary and a non-monetary standpoint and as something related to both the object of exchange and the interactive relationship between customer and supplier and, finally, between the other network actors. These perspectives on value creation bring up the special nature of OSS in terms of the previously discussed licences, networks and customers.

While both academics and actors in the field commonly make use of the concept of value, it is often rather unclear what is actually meant by it in different contexts (Ford & McDowell, 1999; Gummerus, 2013; Lindgreen et al., 2012;

Lindgreen & Wynstra, 2005; Paananen & Seppänen, 2013; Ramsay, 2005; Thomas & Wilson, 2003; Woodall, 2003). From a rather broad perspective, the concept of value can be regarded as the trade-off between benefits and sacrifices (Berry & Yadav, 1996; Lapierre, 2000; Parolini, 1999; Ravald & Grönroos, 1996; Reidenbach et al., 2000; Walter et al., 2001; Woodall, 2003). These costs and benefits can be understood in monetary terms, but they can also be seen as including non-monetary rewards, such as competence, market position and social rewards (Walter et al., 2001). Non-monetary costs might include time, effort, energy and conflict invested by the customer to obtain the product or service. In an OSS environment, the actors that operate in the development community are usually more motivated by non-monetary benefits than directly monetary ones. However firms, in the end, seek the monetary value, even though OSS offers them different kinds of ways to create and capture this value. From the monetary point of view, the licence questions bring up one dilemma for firms to solve – OSS does not provide the same kinds of possibilities for monetary value created through intellectual property rights (IPRs) as proprietary software can offer.

However, in the end, the monetary and non-monetary costs and benefits are evaluated in the mind of the customer (see Teixeira et al., 2012). Parolini (1999) discusses absolute and differential value, the latter of which should be understood as dependent on the customer's own expectations and evaluations. Thus, value

is something that the customer perceives (Ulkuniemi & Helander, 2012). If the customer does not perceive the value of the created software, it does not realize value to the firm either, whether it is an OSS or a proprietary software solution. However, with an OSS solution, the firm has not usually put as much cost into its development, in comparison to a proprietary solution, and thus, in this way, OSS may offer a firm decreased risks. Recent research on value creation (Yi & Gong, 2012; Mukhtar et al., 2012) has focused on customer value co-creation. For example, MacDonald et al. (2011) emphasize that value unfolds in actual use, not only in exchange. Furthermore, value creation should be understood as a process during which the customer and supplier interact (Helander & Ulkuniemi, 2012). During the interaction, the product or service is exchanged between the parties and thus the benefits and sacrifices are realized. However, there is also a great amount of interaction between the parties in the relationship that are not directly related to the object of exchange. This interaction usually influences how the customer perceives the total value gained.

In an OSS environment, the relationship between the firm and its customers is not the only one to take care of, as the network formed of the actors in the development community has a big role too. When focusing on the value creation process perspective, it is important to understand that the process of value creation will differ based on whether value is created by an individual, an organization or society (Gummerus, 2013;

Lepak et al., 2007). In the case of OSS, the network is so multi-faceted in nature that all of these three actor groups are potentially relevant as value creators.

We argue that, just as it is not enough to study a relationship from the viewpoint of one party alone, the analysis of value creation should not focus only on the customer's perspective – this subject being, unfortunately, the main area of concentration in literature (for refreshing exceptions, see Möller & Törrönen, 2003; Walter et al., 2001). In the OSS context, the analysis should be broadened to also include the development community, as their role in the value creation process is remarkable. In the least, it should be noted that the customer acquiring the software solution and the firm as the supplier of that solution both have their own views and influences on the value that is created, and both parties also want to capture their own share of that value. These are aspects that are highly relevant to study in the OSS context, as interesting differences can be found between proprietary business and OSS-based business considering what motivates supplier's or customer's value capture.

The multiple viewpoints concerning value creation in the OSS context can be summarized well by the approach proposed by Keen and Williams (2013). They have studied value creation in the context of digital business, which provides fruitful viewpoints for an OSS context also. Referring to their work, it can be concluded that OSS business is driven by the same forces as business in general, with one crucial difference: value

according to OS solutions compared to proprietary solutions is particularly created through the increased choice space. These aspects of increased choice space, motivators of value creation and capture, both from the supplier's perspective and the customer's perspective, are further analysed later in this paper.

BUSINESS MODELS IN OPEN SOURCE SOFTWARE BUSINESS

The Purpose of a Business Model

A business model is a tool for exploring how to create and capture the value of an idea. It is an abstract representation for mediating between the development of technology and its economic value creation (Mäkinen & Seppänen, 2007; Cavalcante, 2013). The concept has received lot of interest, both in practice and in academia (see Zott, Amit & Massa, 2011; Teece, 2010; Hacklin & Wallnöfer, 2012). There has been much confusion about the division of tasks between a strategy and a business model (Magretta, 2002; Doganova & Eyquem-Renault, 2009). By definition, a business model should encompass the business logic of a company (Casadesus-Masanell & Ricart, 2010). Although the concepts of business models and strategies are highly complementary, they are not the same. A strategy focuses on value appropriation, while a business model explains how value is created for all stakeholders. Chesbrough and Rosenbloom (2002) made three clear distinctions between the two. First, a

business model is based on value creation for the customer, but an emphasis on capturing that value and sustaining it is part of the scope of a strategy. Second, the financing of the value creation is implicitly assumed in business models, whereas a strategy explicitly considers the financing issues of value creation because of the underlying assumptions of shareholder value creation. Third, there is a difference in the assumptions about the state of knowledge held by the firm and that held by its stakeholders. Business models consciously assume limited and distorted information and knowledge, while a strategy is built on analysis and refinements in knowledge and therefore assumes the existence of a plenitude of reliable information to be transformed into knowledge. A practical distinction could be that a business model is a system that shows how the pieces of a business fit together, while a strategy also includes the business' competition (Magretta, 2002).

Designing a Business Model for an OSS Context

An explicit business model helps managers to see some of their assumptions made in designing a business model. The boundaries that guide their thinking processes may also become visible and thus the options can be considered more easily. Also the prerequisites for the success of the business model may become clearer. Another question is the number of business models that a company can run (Casadesus-Masanell & Tarzijan, 2012). Should a company have only one, context-independent business model or

should a company design and run several business models that complement each other and perhaps represent some context-specific characteristics? One of the most famous, context-independent business model representations is the Business Model Canvas (Osterwalder & Pigneur, 2010) that represents, through nine building blocks, the elements that comprise a business model. In Table 1 we present how the Business Model Canvas operates. First, we describe briefly the content of each element in the Business Model Canvas (based on Osterwalder & Pigneur, 2010). Second, when managers consider choosing an Open Source option as an alternative to a proprietary option (see de Carvalho & Johansson, 2012), they should consider the questions shown in Table 1 in the context of their business environment.

The *Value Proposition* explains the overall bundle of products and services offered by the company. OSS may open a faster way to the market, giving a time-based advantage over the competition. In addition, the offering may comprise features that would not be possible to develop in-house, thus widening the potential target market. OSS can change the content of the offering, for instance increasing the importance of complementary services. The selection of *Customer Segments* is closely linked to the designed value proposition.

The *Distribution Channel* in digital business is of great importance. Reaching the potential customers is a major challenge to companies since differentiating a product from dozens, or even millions, of different applications is

Table 1. Description of the business model elements and questions to consider

	Element	Description	Questions to consider with OSS
Value offering	<i>Value Proposition</i>	<i>... the bundle of products and services that create value for a specific Customer Segment</i>	Will OSS emphasize differentiation or low cost? Will there be a minimum viable product at the launch of the product or service? Is there a need for complementary products/services?
	<i>Customer Segments</i>	<i>... the different groups of people or organization an enterprise aims to reach and serve</i>	Who will be your key customers? Will OSS serve a new or existing market, or does it enable re-segmenting in existing markets? Does OSS increase the total addressable market size?
Customer relationship	<i>Distribution Channel</i>	<i>... how a company communicates with and reaches its Customer Segments to deliver a Value Proposition</i>	Is there a change in direct or in-direct channels that are employed? Will it increase the demand for the OSS-based solution?
	<i>Customer Relationships</i>	<i>... the types of relationships a company establishes with specific Customer Segments</i>	How will you engage customers with the development process whose results will not be proprietary? Which development forums should your company be engaged with? What is the role of the OSS community in customer communication? How will you initiate and maintain the connection with the OSS community?
	<i>Key Activities</i>	<i>... the most important things a company must do to make its business model work</i>	Do you know what Key Activities are needed to make your business model succeed? Which activities can you, and should you, keep in-house - and which ones you should leave to your Key Partners?
Value Delivery	<i>Key Resources</i>	<i>... the most important assets required to make a business model work</i>	How will selecting OSS affect your Key Resources? What new competencies will you need and which competencies will become obsolete? How will you ensure the continued learning of your staff when some of the brightest talents are outside of your company?
	<i>Key Partners</i>	<i>... the network of suppliers and partners that make the business model work</i>	How will you deal with the OSS community? Are you prepared for competition with your rivals? Can you leverage your users and customers to the community members? What activities need to be done to engage your users? Can you establish an ecosystem here?
	<i>Cost Structure</i>	<i>... all costs incurred to operate a business model</i>	To what extent can you decrease the development and distribution costs with OSS? How will the selection of OSS affect cost structure and which Key Activities will drive costs?
Revenue Logic	<i>Revenue Structure</i>	<i>... the cash a company generates from each Customer Segment</i>	Where will the money come from? Which OSS licence is the best one for your business model? How much will OSS-related revenues contribute to overall revenues? Can you provide a free and a premium version (freemium)?

tricky. Timmers (2003) suggested that with OSS, the focus shifts from creating value through internal activities to creating value through external relations. This multiplies the number of relationships involved, and therefore the *Customer Relationships* within the value-creating network would be an inseparable part of the business model.

Key Resources will change when deploying an OSS option. For instance, the requests from the users and customers will increase and require different talents, often also requiring more people, to respond to them. In addition, OSS licences need some attention and a level of understanding from the company staff, especially with an emphasis on skills related to agreement and intellectual property rights. Further, one *Key Activity* will be acting with the selected communities, which oftentimes have the structure of an “onion model” (see Nakakoji et al., 2002). There may be a multitude of people linked loosely to a particular community, but all are not of equal importance. A company has to understand what kind of decision-making mechanism a community utilizes (see Crowston & Howison, 2005; Mockus et al., 2000). An example of *Key Partnership* is IBM’s cooperation with the Eclipse community. IBM supports the community’s development with donations and by hiring experts to work for the community’s purposes, whilst concurrently supporting IBM’s business purposes.

Decisions made regarding the elements above determine the *Cost Structure* of a business model. Designing a

business model should be an iterative, multi-objective optimization process in which different alternatives and their linkages with other elements are considered carefully. Finally, *Revenue Structure* reflects pricing logic. Sources of revenue may include, for instance (not a comprehensive list), selling advertisements, building hardware, getting revenue share from transactions, selling services, selling a value-added platform, selling premium access or selling licences. A famous example of a successful licensing model is MySQL and its dual licensing (Vance, 2009). If you develop and distribute OSS applications under GPL licence, it is free to use MySQL, whereas a commercial licence is offered for business purposes. There is no consensus as to whether some revenue models are better than others – one can only go by examples of what may create successful business.

The content of the elements of a business model differs not only between proprietary and OSS contexts, but also among different types of OSS intensive firms. Firms deploy OSS differently, reaping the benefits and competitive differentiation from their rivals. For example, some firms utilize OSS tools in their own software development, others use OSS components as part of a system solution sold on to end-customers and some firms are built wholly on OSS (Helander et al., 2007). Furthermore, the skills required can vary widely, depending on the maturity of the Open Source project (Woods & Guliani, 2005, pp.45–66). In Open Source business, a firm should recognize its own desired

position and level of skills required to achieve this. When the Open Source movement matures, Open Source expertise will increasingly be for sale, and thus, firms will have better access to hire this expertise.

DISCUSSION

One of the premises for successful business is that the value perceived by the customer must be higher than the monetary counterpart, the price. Traditionally, only when this is the case may a monetary transaction occur. The very essence of a business model is that it is a construct mediating the creation of value from technological potential. Thus, the concept of value must be regarded as multidimensional, and perceived value, in particular, as seen from both customer and supplier perspectives, is important when one considers value proposition. As Raymond (2000) pointed out in his seminal book, the developmental work for an Open Source project should be executed according to the top-down principle, not bottom-up. Therefore, managers can remember as a basic guideline that the firm should, firstly, be very clear as to what needs it hopes to address by taking part in, or even simply utilizing, OSS. One of the first questions concerns the architecture of software: Does the software architecture allow for pieces, or even the full package, of software to be open-sourced? Kilamo et al. (2010) have presented a comprehensive set of questions and a process for this purpose. When these

basic questions have been answered, a company may proceed further.

The Business Model Canvas has become the de-facto standard for business modelling purposes, having sold over 650,000 copies (www.businessmodel-generation.com). It has been considered especially helpful for visualizing and communicating different business model options. There have also been other proposals for business model conceptualization (see Zott et al., 2011 for a comprehensive review). For instance, some authors have suggested computer-aided tools to assist in the business model implementation phase (Gordijn, 2004; Hüsigg & Kohn, 2011). Further, business model innovation (Schneider & Spieth, 2013) and process of discovering the business model (Muegge, 2012) have both received attention recently. Basically the Business Model Canvas and its elements offer a setting for an OSS supplier company to decide which of the elements form the core logic of the specific OSS business model. For instance, in consulting business the focus is on delivering value to targeted customer segment through exploitation of personnel's key competences (knowledge resources). When customers' receive value from the consultation, value capture through the revenue model (e.g. time-based pricing) becomes possible.

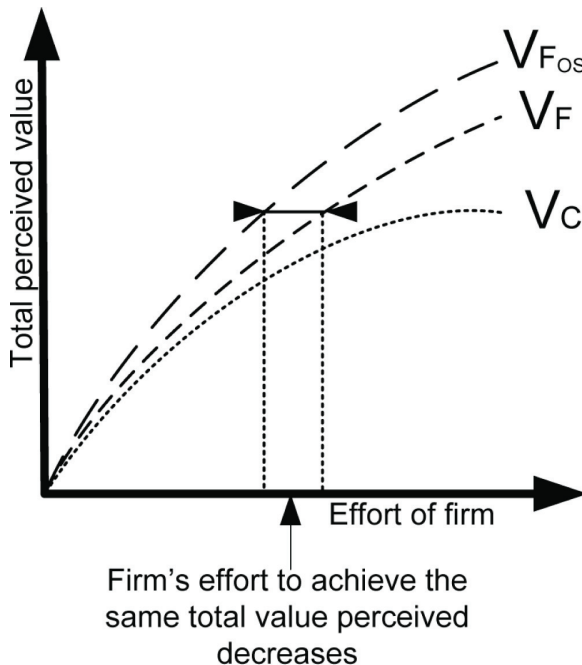
Another aspect in the development of OSS-based business models relates to the competitiveness of the business model. Value creation efforts spend resources that incur costs, and ultimately the profitability differences between

firms may explain why some firms will survive and others will not. In Figure 1 we attempt to illustrate how OSS changes the value creation effort (from the supplier's perspective). In order for a business to be profitable, the value captured by the supplier (denoted by V_F) should be higher than the value created for the customer (V_C). We argue that the value perceived by a customer may change due to use of OSS, but not in every case. For instance, the perceived value may change if the customer perceives the utilization of OSS components as being more valuable than proprietary components for ideological reasons. We argue that the effects of utilizing OSS components may result in a higher perceived value for the supplier firm. For example, if a firm can

re-use OSS components in its product development, it may achieve either more value with the same effort or the same value with less effort (see in Figure 1 the difference in effort level between V_{Fos} and V_F). Figure 1 illustrates the viewpoint of both the customer and the supplier in value creation.

The success of the interaction between the supplier and the customer influences the net value perceived by the counterparts in an OS environment as much as any other. Thus, the supplier needs to keep in mind that it is not only the functionality of the actual object of exchange, i.e. the software, but it is the services offered around the software and the whole relationship with the supplier that influence the value perception of

Figure 1. Perceived value and effort of the firm with proprietary versus open source software



the customer. In OSS cases, the supplier may be offering services to the customer, while the source code as the actual object of exchange could be acquired by the customer directly from the specific OSS project. Thus, the customer is actually acquiring the software from the specific supplier because they trust the ability of the supplier to create more value for them in the form of, for instance, smooth cooperation, upgrading and/or maintenance services. A customer may choose the supplier because the supplier has a better access to distribution channels. The access enables to the customer's service business a wider reach to potential new customers, instead of having only a single-party relationship with its own supplier.

CONCLUSION

In this paper, we have addressed value creation and business models in the context of Open Source Software. We have considered how value is created through business model elements and provided a list of questions that should help managers in their considerations of Open Source Software. As the number of firms involved in Open Source Software increases, interest in value creation through the utilization of Open Source will grow. Business models provide a tool for value creation in an OSS context, and recent interest towards business model innovation is closely linked to this. Further research should focus on different patterns of business model innovation – particularly how value creation architecture is manifested in

business models. In addition, designing, developing and implementing customer experiences through business model innovation deserves more attention from the scholars.

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