Muistio • Brief
ISSN-L 2323-2463, ISSN 2323-2463

21 • 7 January 2014

Extracting Value through Technology and Service Platforms: The Case of Licensing, Services and Royalties

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This brief is a part of the ongoing research project "Value Creation and Capture – The Impact of Recycling and Global Dispersion of Intangible Capital."

Suggested citation: Kalm, Matias, Seppälä, Timo & Ali-Yrkkö, Jyrki (7.1.2014). "Extracting Value through Technology and Service Platforms: The Case of Licensing, Services and Royalties".
ETLA Brief No 21. http://pub.etla.fi/ETLA-Muistio-Brief-21.pdf

Technology and service platforms are becoming even more important to firms and countries as software built on these platforms is integrated into physical end-products and services across business environments. We find two especially significant topics to explore. First, there is a clear motivation to increase understanding of how platform-based business models integrate with the value-adding activities of firms, which then foster a country's economic development. Second, there is lack of knowledge on how value is created, captured and distributed in young and growing firms through intangible assets, i.e., tacit and non-tacit knowledge. This brief discusses these topics.

Introduction

Firms that build their business models on technology and service platforms may have a special competitive advantage (Kim & Kogut, 1996; Meyer, 1997; Sullivan, 1998; Yang & Jiang, 2006). This platform-based competitive advantage consists of possible access to several markets across industries with a single innovation. Furthermore, these platforms typically integrate with larger global value chains. It is therefore important to understand the value creation and capture logic of firms that exploit technology and service platforms and operate in global value chains. Additionally, in terms of job creation, these platforms imply high-level tacit knowledge that plays an important role in the creation of firm's intangible assets.

A firm's business model can be built on intangible assets without any physical substance (Lev, 2001). This means that business models based on intangible asset comprise all value-creating and capturing elements of a firm (Smith & Parr, 2000). These models and elements of value added have been realized in several forms (e.g., Zott & Amit, 2008; Seppälä & Kalm, 2013). As with tangible assets, firms' intangible assets can be dispersed across numerous geographies, i.e., national economies. Therefore, it is vital to recognize the geographic location of each intangible asset and how these locations affect the distribution of value added.

This brief focuses on the value chain of a young and growing Finnish software firm to better understand the role that technology and service platforms, business models, and different stakeholders play in value creation processes based on intangible assets. Furthermore, the case firm uses its intangible assets, mainly the tacit knowledge of its employees, to build a software platform, which then acts as a tech-

nology and service platform for other larger platforms in another industry domain. The final software product, which is built on a developed technology platform, is embedded into the end product, which is then sold to global consumer markets. Moreover, this brief seeks to answer the following research question: *How can knowledge-based business models add value?*

The key findings of this brief are twofold. First, the licensing- and royalties-based business models have so far created less value for the company than the service component, which is a secondary product for the company. Furthermore, the number of platforms sold in the market also has significance for licensing and royalty contributions. Second, the firm has a substantial potential to adjust how the value is distributed by changing its business model. Even changes in transfer pricing significantly affect the distribution of value added.

The study proceeds as follows. We first address the literature concerning technology and service platforms, industry architectures, and intangible assets. In section 3, we describe the methodology and the case firm. In section 4, we present the case analyses and the results. The concluding section discusses the results.

Theoretical framework

The software firm's business models, which are also the source of value creation for the firm, often depend on the role of technology platforms in a specific industry and on the architecture of that industry. The software industry was one of the early adopters of these two concepts. Due to the knowledge intensive nature of software platforms, this brief also discusses the role of intangible assets.

Technology and service platforms

Technology and service platforms become more valuable as the number of external adopters increases (Cusumano, 2010). Furthermore, platforms also benefit from network effects because, as the number of users of a platform increases, the users benefit more from using that particular platform (Evans et al., 2005). It is strategically important for platform creators to attract other users to their platforms, as changing between platforms is often considered difficult due to high switching costs (Evans et al., 2005). However, challenging situations occur because a platform leader and its competitors may both compete and collaborate at the same time, sometimes among the same actors (Bengtsson & Kock, 2000; Gawer & Cusumano, 2012).

Technology and service platforms are typically multisided (Evans et al., 2005). Multi-sidedness refers to platforms that serve several distinct stakeholders that have different needs but whose cooperation is needed if a platform is to succeed (Evans et al., 2005). Close collaboration between different stakeholders also makes the platform valuable for each stakeholder. Furthermore, Evans et al. (2005) argue that the less vertical integration exists in an industry, the more multi-sidedness can be observed. Remarkably, the authors also state that even though a platform is multisided, vendors often receive their income from only one side.

Technology and service platforms serve as a basis for a larger number of firms that build their business models, products, and services based on these platforms (Gawer & Cusumano, 2012). These technology and service platforms are therefore unlike product platforms. First, industry platforms operate in conjunction with other technologies and also cooperate with different firms. Second, technology that complements the platform creates little value without support from other technologies (Cusumano & Gawer, 2002; Cusumano, 2010, Seppälä & Kenney, 2012). In addition, the above platforms differ from product platforms in that the end use of the end-product is not completely pre-determined (Gawer & Cusumano, 2012).

Industry architecture

Industry architecture is a research area that complements platform literature (Cusumano et al., 2012). Jacobides et al. (2006) define industry architecture as "a sector-wide construct that defines the terms of the division of labor." Architecture is not only industry related, but it also differs from country to country even if the tasks are fairly similar. However, dissimilar architectures may show remarkable stability, meaning that there are numerous potential ways to divide the labor. Architectures are formed by two processes: they are partly designed and partly emergent. The design process is affected by, among other things, regulations and standards, and the emergent process is based on social templates and means.

The creation of an industry architecture is not an autonomous process. On the contrary, Jacobides et al. (2006) suggest that an innovator has a great opportunity to shape the architecture of actors around them. Furthermore, in a new industry many viable architectures can exist, but over time they become more and more stable as system interfaces begin to emerge (Jacobides et al., 2006). This enables stakeholders to divide labor, which has a profound impact as an efficient transaction method induces new stakeholders to adopt a common interface that decreases transaction costs. However, this is a drawback for innovative players who want to change the interface because the cost of change may be substantial. Jacobides et al. (2006) conclude that the industry architecture provides two templates: the first template defines value creation and how labor is divided, and the second defines value appropriation and how surplus is divided.

A small firm can fit with different industry architectures by influencing the development of a sector to fit with the firm's capabilities (Santos & Eisenhard, 2009). Furthermore, Jacobides et al. (2006) propose that small firms can take over an oversized portion of the industry architecture value capture if they have an innovation entitling them to create a new industry architecture. Therefore, possibilities to create new industry architectures emerge when new technologies surface or substantial changes take place.

Intangible assets in software platforms

The business model of a software company is built on the know-how of its employees. Software firms can therefore be seen as knowledge-based organizations (Barney, 1991; Nonaka, 1994; Zander & Kogut, 1995). A software firm's primary intangible asset is the knowledge that it possesses. Johnson et al. (2002) define four different knowledge types: know-what, know-how, know-why, and know-who. The first of these, know-what, refers to factual knowledge, and the second, know-how, refers to procedural knowledge; know-why, refers to cause and effect, and finally, know-who "involves information about who knows what and who knows what to do." All four types of knowledge are needed when a software platform is being developed, as well as later during sales operations. The software platforms of small software firms are typically integrated into larger products, services, or technology platforms in global and often industry-specific value chains. The knowledge that firms and their employees possess is adapted into a product through software R&D processes and is then embedded into the final product provided to consumers. Knowledge needs changes and they depend on the specific state of operations. For example, during the product development phase knowledge needs are different than in situations when the firm is offering services for its products.

Industry setting and case firm

In the software business, the most successful firms are those whose products and services become industry-wide platforms (Cusumano, 2010). Typically, industry architecture, technology platforms, and services complement one another to a certain extent in the software business (Cusumano et al. 2008). For example, customers may demand services before buying a product if the service is not offered by a firm. The services offered may either enhance or extend the product. Service enhances a product by offering support or consulting services, and extension means that a service adds new features to a product.

The case firm is a Finnish software company whose history dates back to the computer demoscene in the 1980s. In particular, the firm is connected to a certain demo group from which it arose through several spinoffs. The firm's expertise can be tracked to that time and to the know-how accumulated by the members of that demo group. After the spinoffs, the firm has focused on developing and selling a software product that uses the firm's proprietary technology. In its current form the firm is less than five years old, and its annual revenues are between 1 million and 5 million euros. The firm can be considered as a startup firm, since the firm has received several millions of venture capital recently and it has sustained heavy losses in recent years. In addition, the case firm leverages its software platform in several different industries. We provided anonymity for the case firm in order to gain access to its financial data. This study used data from the year 2012.

The value chains in the case firm and its industry are illustrated in Figure 1. On the whole, the industry value chain is quite comparable to the traditional value chains of manufacturing

industries. However, the case firm's value chain differs from traditional ones. As a platform provider, its customers are either the manufacturers of end-products or service providers that design and implement the final software products for the manufacturers using the tools provided by the case firm. Moreover, the providers of a software platform do not need specific inputs to produce the platform.

The software platform that the firm sells consists of two distinct software components, with revenue therefore being generated from two different value-adding streams. The first value-adding stream is the licensing revenue obtained through sales of the first component to the customer, and the second value-adding stream is the royalty revenue from the second component. The latter depends on the sales of the final product into which it has been integrated. The first component is needed to create a software program, and the second component is needed to run that program. The software product's programming can be done by the end-user, or it can be outsourced to a third party. Currently, the case firm often provides the program used in the end product as a service. In the future, however, the case firm aims to withdraw from this activity, as the program's inclusion is not planned for future service offerings. On the contrary, its main service, in addition to its platform-based software products, will be support for end-users. End-user support has several forms, including both telephone and email support and software updates for the firm's programs. These updates contain both bug fixes and new features.

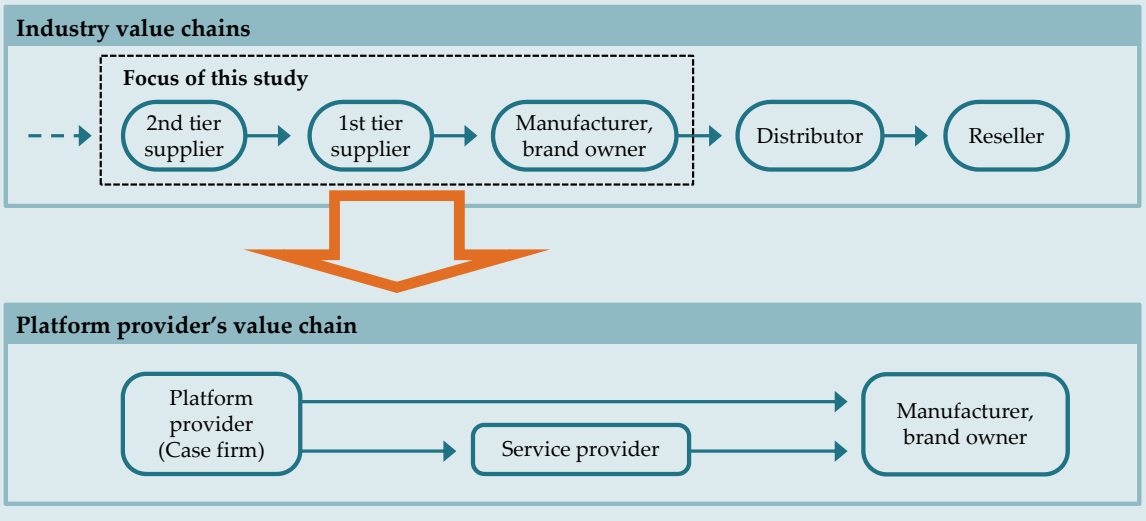
To generalize, the firm has created and is now further developing a software/technology platform, which is then licensed to customers across different industries. While using the case firm's software platform these actors create their own software products, which are then integrated into larger technology platforms in global value chains. These platforms are then sold to end-users as physical products, which in practice means that end-users are not privy to the case firm's software platform.

Case methodology and results

Our methodology is based on global value and supply chain perspectives (see Linden et al., 2009; Dedrick et al., 2009, 2011; Ali-Yrkkö, 2010; Ali-Yrkkö et al., 2011; and Seppälä & Kenney, 2013). However, only a few earlier studies have applied the value chain methodology to services (see, e.g., Seppälä & Kalm, 2013).

In this study, we calculate the case firm's value added as the difference between the firm's revenue and its external costs as opposed to calculating the value added as the sum of profits, rents, cost of employees, depreciation and amortization. Furthermore, value chain analysis is conducted at the group level in this case because distinguishing the value-adding inputs of a single sale is virtually impossible. Therefore, this study uses firm-level analysis, as it is the only viable option. Nevertheless, the anal-

1 Industry and platform provider's value chains



ysis should approximate how the value added from a single sale of the software platform is distributed.

The results of analysis in Figure 2 show how the value added is distributed among the case firm's internal services, the external services it has purchased, and the equipment it has procured. The total value added equals the case firm's revenue in 2012. The case firm's revenue also equals the total value added generated by sales of the firm's software products.

The case firm's internal services are responsible for generating 22% of the value added. External services that the firm has purchased generate 66% of the value added, and equipment procurements generate 12%. Two main reasons explain the high volume of external services. First, because the markets for the software are global, the firm's travel expenses are high, and they are procured from external service providers. Second, the firm has used external consultancy services to help it grown, which has also increased the use of external services. Office equipment and software procurement, which is the third item, are responsible for only 12% of the value added.

The geographic distribution of the value added is presented in Figure 3. This equals the amount presented in Figure 2.

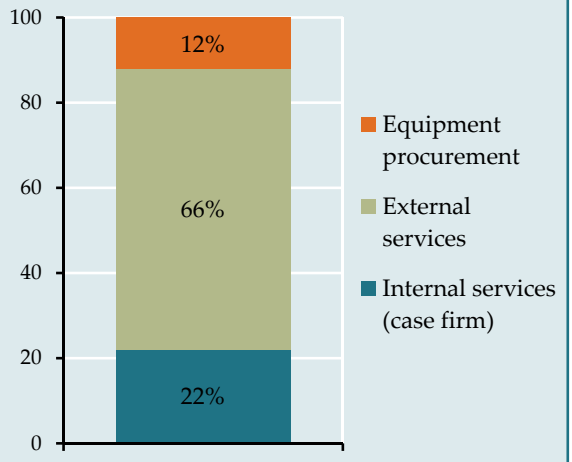
In conclusion, 38% of the value added is created in Finland. Asia is the second most important area with 35%, and the third most important is North America, which generates 13% of the value added. Europe is responsible for 11%, and other countries contribute 3% of the value added. It is evident that most of the case firm's value added is created in Finland. This outcome is natural, as the firm's research and development, administration, and sales are primarily conducted in Finland, and the firm's foreign operations consist mainly of small sales offices. Furthermore, the high share of Asia's value added can be explained by two factors: a) R&D outsourcing in Asia; and b) increased sales activities due to the Asian market's potential for the case firm's products.

Until now we have examined how the value added is divided on the firm level both by activity and by geography. However, when considering the end product into which the final software is integrated, the income generated for the case firm from its platform is usually rather low compared to the sales price of the end product. For example, our analysis shows that less than 0.6% of the value of a single end product is created by the case firm's software platform, including the integration of the software into the end product. The price of the final product may be more than 10,000 euros.

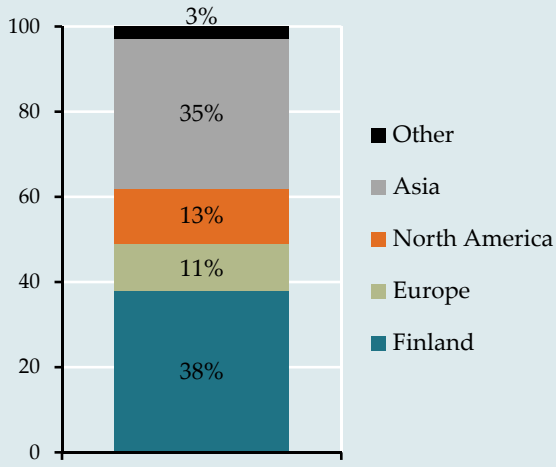
Discussion

Our research has analyzed how a software firm creates and captures value through its software platform based on its current business model. The business model is important because the firm's operations form a part of larger glob-

2 The distribution of total value added by stakeholder



3 The geographic distribution of the total value added



al value chain encompassing large industrial companies. The firm uses its intangible assets, mainly R&D knowledge, to create a software platform and to sell the platform to other firms. The analysis has shown that for the software platform the main value-adding and capturing items are related to the mix of internal and external services. Because software is an intangible asset, there are almost no physical component costs associated with the product's creation. This finding explains Finland's high share of value added. In this case especially, the shares of both the case firm and Finland would be higher if the firm was profitable. At present, the case firm's negative profitability decreases its potential for both value creation and capture.

In addition, our analysis shows that the case firm could, by changing its business model, influence how much value added it creates and how the value added is distributed between different actors and geographic areas within the firm. In some cases, the company might be seen as a gatekeeper of the value chain with its technology and service platform. Furthermore, it is important to recognize that the case firm has decided that its aim is exclusively to provide support services rather than integration services for its software platform. In other words, it provides the tools needed to create and run the software created with the platform. The reason for this decision is that the case firm is striving to grow quickly, and creating and coding the integrated software product as a service for the end-user is a highly labor-intensive process. This hinders the case firm's growth potential, especially because its chosen operations and business model are highly scalable. However, in this model, high initial investments are needed before the product platform will provide any revenue. In addition, we recognize that at the early stages it might be beneficial to a platform provider to provide the actual software product directly as a service for the end-user because the supply for services might be otherwise limited.

The platform provider's business model is not the only factor that affects value creation in a certain business unit or geographical area. By changing transfer pricing, the firm can significantly change how the value is distributed. This is interesting insight shows that transfer pricing is a critical issue, though transfer pricing is not often considered in global value chain studies (in comparison see Seppälä & Kenney, 2013, and Ali-Yrkkö, 2013). For example, when considering the geographic distribution of value added, the case firm has decided to show a steady 5% profit at its foreign offices. This value is fixed and does not change from country to country. However, the company's Finnish head office carries all operational risks alone, justifying the case company's decision to show all of its remaining profits (or losses) in Finland.

Our analysis clearly supports the platform theory arguments made by Cusumano & Gawer (2002) and Cusumano (2010). The case firm's software platform undoubtedly shows aspects of a technology platform. First, the software platform is used by a third party to create software, which is then embedded into an end product. This is increasingly common in different industries because the importance of such platforms is increasing. Second, the product created with the software platform adds relatively little value to the end product. Moreover, the case firm's software platform becomes more valuable when the number of adopters increases as the quantity of firms providing various services for the platform increases. In addition, the case firm's platform combines the software product and services even though its core product can be seen as a service. Nevertheless, the platform's users require the case firm to provide support services in order to use the software platform.

In contrast to previous studies that have focused on physical goods, this research is built on single case study of a digital product (in comparison see Ali-Yrkkö et al. 2011). In the N95 case study, the direct materials and final assembly represented 35% share of value added, while in the digital case product this share is 0%. As for the geographic distribution of value added for N95, Finland captured 40% and for this digital case product 38%. This research has been based on a single digital product; the future research could investigate different digital innovations, designs, and manufacturing locations of a digital product and/or a service from different viewpoints.

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