

The value chain's values: Interpretations and Implications for firm and industry analysis

Diemo Urbig

Humboldt University of Berlin

urbig@informatik.hu-berlin.de

Abstract. How can e-business contribute to value creation? The answer is frequently given by a value chain analysis. Because the value chain is about activities that contribute to value creation, the definition of value is very important. From Porter's original work and also from other current management and e-business textbooks one can derive two distinct interpretations: revenue and willingness to pay. This article discusses both of them. The willingness to pay is chosen as the appropriate interpretation. The article also shows that the value chain analysis frequently assumes zero costs for production and collection of payments. Therefore, to think about customer relations and business models the value chain analysis is incomplete and has to be supplemented by a payment chain analysis. We propose the extended value analysis. Short examples from the search engine industry illustrate that the subject of this article is not only of academic nature but has implications for practitioners, too.

Keywords. value chain, payment chain, value creation, extended value analysis

1 Introduction

Many firms and their managers aim to create value; but what is value? Asking this in general, we might end up with a book. But here, we just want to answer this question for the value chain. In 1985 Porter proposed the value chain as a tool to identify and to analyze the origins of competitive advantages. It integrates customer-oriented and cost-based ideas (Meffert 1994, 51f.). The value chain approach is part of many current textbooks on marketing (e.g. Hax and Majluf 1996, Meffert 1994, Meffert 2000, Hayes et al. 1995) and on strategic management (e.g. Saloner et al. 2000, Staehle 1999). Also textbooks dedicated to e-business use the value chain approach (e.g. Wirtz 2000, Zerdick et al. 2001). Despite the broad acceptance and the maturity of the value chain approach the meaning of the term value is not without contradiction among the different publications. The reason might be the following statement:

“In competitive terms, value is the amount buyers are willing to pay for what a firm provides them. Value is measured by total revenue, a reflection of the price a firm's product commands and the units it can sell.” (Porter 1985, p. 38)

The article analyses two different interpretations of value. They both cannot only be taken from different textbooks, but also from Porter's statement: willingness to pay and revenue. The second part of this article sheds light on the stream of payment, whose impact on value creation is frequently marginalized.

This introduction continues with a brief overview concerning the value chain. Then, the search engine industry is introduced to serve as an example for some aspects of this article. The example does not represent a full analysis of the search engine industry, but

it can illustrate some relevant aspects. Following this, the introduction provides notations that are used to make the following discussion more precise. The second part of the paper identifies two important but conflicting definitions of the value chain's value. It discusses some properties and selects one definition as the appropriate one. The third part of this paper deals with an implicit assumption of the value chain analysis. It is about zero costs for payment-related activities. The article checks whether this assumption is appropriate or not. Based on the results, an extension of the value chain analysis is suggested. Finally, some implications for vertical integration are drawn.

1.1 The value chain – an overview

A competitive advantage ultimately derives from providing better customer value for equivalent cost or equivalent customer value for lower cost. As customer value depends on the goods and services delivered to the customer, the value and the costs depend on the firm's activities to create these goods and services. The *value chain* disaggregates the firm into its distinct activities (Porter 1985; Anthony and Govindarajan 1998, p. 67). It is the linked set of a firm's or many firms' activities that are necessary to create goods and services for a customer or a group of customers (see Anthony and Govindarajan 1998, p. 316, Wirtz 2000, p. 261). Within a single firm the value chain addresses activities that either directly contribute to the production of the goods or services (primary activities) or indirectly influence this (support activities). Instead of analyzing a single firm one can also embed a firm's activities in a larger stream of activities, which Porter terms the *value system*. It includes activities of all firms involved in the production of a good or service, from basic raw material sources for component suppliers to the ultimate end-use product delivered into the final consumers' hands (Porter 1998, p. 78, Anthony and Govindarajan 1998, p. 316, Saloner et al. 200, p. 128).

An analysis of the activities' contributions to costs and value helps the firm to identify sources of competitive advantage. The analysis should also exploit the linkages between activities (Porter 1998, p. 77). A link implies that a change in an activity influences the value and costs caused by another activity. Such interdependencies can concern either activities within the same firm or activities located in two different firms or even the customer. For the latter case one often considers the value chain of a supplier or of a customer.

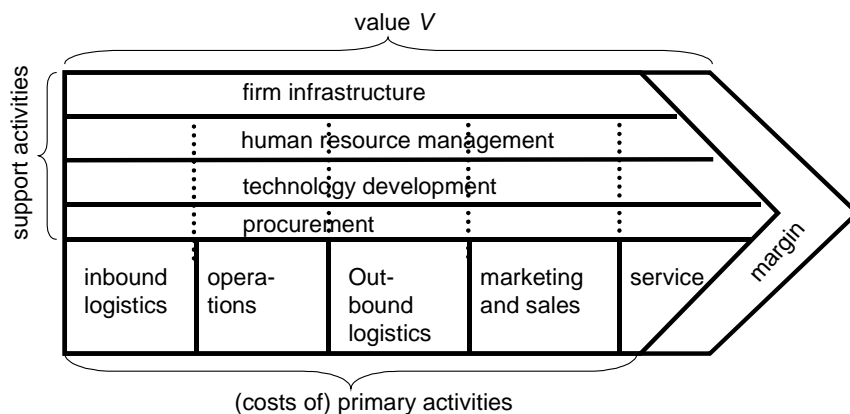


Figure 1: The value chain

The value chain displays the total value, and consists of value activities and margin. Margin is the difference of value and total costs of activities (Porter 1985, p. 38). A value creation according to the value chain approach is assumed if there is a positive margin (Porter 1998, p. 77).

According to Meffert (1994, p. 52) there is no standardized way for a value chain analysis. There is some scope in the identification of the customer, of his perceived benefit, as well as in the identification of the value-creating activities and the amount of their contributions to the value. Hence, the value chain approach is not objective in the sense that every time everybody can identically reproduce a value chain for a firm at a given time. Beside this, even the definition of value is not clear. The latter problem is addressed here.

1.2 The early search engine industry – an example

To support our argumentation we will use examples from the early search engine industry. A search engine, which usually has been started as a scientific project, recognizes that there is a demand by Internet users to find information on the World Wide Web. The idea to start a business to exploit this demand was an easy step after the technology was developed (e.g. web catalogs like yahoo.com or robots like lycos.com). But how do they get the money for it? Several revenue models have been discussed. Advertisement has been the most successful approach, but also subscription-based models and pay per request have been considered. But let us first take a look at the activities needed to provide an opportunity to find something on the World Wide Web.

A search engine is an information provider for specific information: links to web pages with useful content. According to Varian and Shapiro (1999) the value of information providers is based on how they localize, filter, and present the information. This gives three important activities: localization, selection, and presentation. From a technological point of view selection often is a step-wise process, which first stores some information about interesting pages, and second in response to a user's request it selects a subset from them to be presented to the user. Early search engines, e.g. Lycos, Yahoo, and Altavista, not only provided search capabilities but also combined it with additional content: email service and other communication services, as well as shop and Internet service provider functionality. Figure 2 displays these important activities.

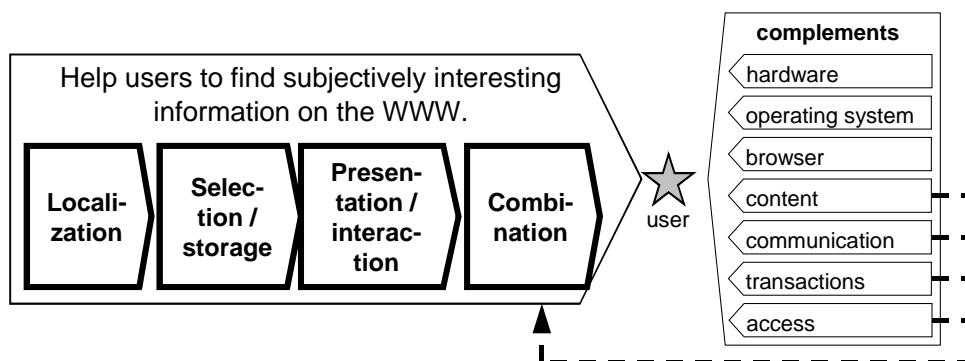


Figure 2: Search engine's value activities with complements

It is not necessarily the Internet user that has to be considered as the search engines' customer. Also advertisers, venture capitalists, or even potential stakeholder might be addressed (see Urbig 2001). In the following examples we only pick up the aspects we are interested in.

1.3 Defining relevant values and criteria for the value chain

Now that we have got a rough idea of the value chain approach, we will focus on our question: What is the value of the value chain? We begin with some thoughts on valuation and then quickly go into some notations used throughout the article. For that we define primary and secondary values, where primary values are a direct outcome of a valuation process. Secondary values are calculated from primary values.

During a valuation process the quality or worth of something is judged. A value therefore refers on the one hand to something that is judged. On the other hand it refers to a criterion that guides the judgment. Considering the value chain we have to define both, the object and the criterion. At the first glance, there is agreement that the object the value chain's value refers to is the stream of goods and services towards a customer or group of customers. Therefore the value is specific for particular customer relation. The relation is also affected by the flow of payments. Hence, we also consider valuations of payments.¹ Based on the valuations we calculate values, which we label secondary values.

Primary values as result of valuations

The stream of goods and services from a firm to its customer and the stream of payments from the customer back to the firm are objects of valuations. Considering the firm's point of view we refer to the first as the internally (*i*) and to the second as the externally (*x*) created object. Both can be valued by the firm (*f*) or by the customer (*c*). Based on the two objects and two criteria, we get four **primary values**:

$$V_{object,criterion} \text{ with } object \in \{i,x\} \text{ and } criterion \in \{f,c\}. \quad (\text{primary values})$$

The value $V_{i,f}$ of an object leaving the firm is the negative cost this object causes². $V_{i,c}$ is the perceived benefit of the customer receiving the object. $V_{x,f}$ and $V_{x,c}$ refer to the firm's and customer's valuations of the payment. For all these values we assume that incoming objects have a positive value while outgoing objects have a negative one.³

It is difficult and therefore sometimes not useful to determine a value exactly, but it is important to have qualitative statements about the impact of influential factors (Saloner et al. 2000, p. 132f.). Especially, it is important to consider that the definition of value and the valuation method determine how the value can be influenced, e.g. costs deter-

¹ To describe a relation between two economic actors also Zerdick et. al. (2001, p. 50) use two inversely directed streams of goods, services, or money. Unfortunately, they do not draw some consequences for the overall value chain approach.

² An object having costs of 5 has a value for the source of the object of -5.

³ If for an object this is not the case we can change the point of view and consider the option to receive the original object as the new object of interest.

mined by opportunity costs might be influenced in another way than costs based on actual payments.

Secondary values as result of comparing primary values

Based on the four primary values we define five additional (secondary) values. A **stream value** is the value that is assigned to the stream of goods and services or to the payment. It sums up the values it has for the creating and for the consuming partner. Stream values answer the question whether the existence of the stream creates positive value. If not, both partners can – if possible – be better off by canceling the object and exchanging benefits for example by a financial transfer. Sometimes, e.g. because of law or technological restrictions, such a financial transfer is not possible or causes more value distortion (more costs), then the original object is only used as a token and not the primary purpose of the firm. The **partner values**⁴ are values that are assigned to firm and customer and tell us something about how firm and customer see the relation they both are involved in. A positive partner value implies that it has worth to participate in the relation. A negative partner value implies that it is better to drop out of this relation. If all primary values are aggregated we get the **relation value**. The relation value signals whether the relation creates in sum a positive value, i.e. if it has an economic value at all. This value might even be distributed among the partners such that one partner has no incentive to continue the relation.

$$\begin{array}{lll}
 V_{i,f+c} = V_{i,f} + V_{i,c} & \text{and} & V_{x,f+c} = V_{x,f} + V_{x,c} & \text{(stream values)} \\
 V_{i+x,f} = V_{i,f} + V_{x,f} & \text{and} & V_{i+x,c} = V_{i,c} + V_{x,c} & \text{(partner values)} \\
 V_{i+x,c+f} = V_{i,c} + V_{x,c} + V_{i,f} + V_{x,f} & & & \text{(relation value)}
 \end{array}$$

These definitions imply some properties of the values: First, if the relation value is positive (negative), then at least one object value and one partner value is positive (negative). Second, if either object values or partner values have the same sign then the relation value has this. Third, If only one partner value or one object value is known, then the direction of the relation value and the other values are not determined.

2 Dealing with conflicting definitions of the value chain’s value

After the introduction, the second part of this article takes on the question of the definition of the value chain’s value. We first present two definitions and explain why they usually are conflicting. We then identify the more appropriate one.

2.1 Two conflicting definitions of value and margin

Different textbooks covering the concept of value chain suggest two different interpretations of the value chain’s value V . The first interpretation defines that the value is equal to the revenue that a firm gets in return for the delivery of a good or service (Porter 1985, p. 38, Hax and Majluf 1996, pp. 120, 161, Zerdick et al. 2001, p. 31; Meffert 1989, p. 261). From this we get the margin M as the partner value of the firm, i.e. the

⁴ We could refer to the partner values as stakeholder value, but here we do not want to relate this to stakeholder literature.

profit as the difference of revenue and cost of performing the value activities (Porter 1998, p. 77).

$$V = V_{x,f} \text{ and } M = V_{x,f} + V_{i,f} \quad (\text{definition R})$$

The second interpretation of the value chain's value is based on the assumption that "value is the amount buyers are willing to pay for what a firm provides them" (Porter 1985, p. 38, Porter 1998, p. 77). Assuming perfect rational customers, the willingness to pay can be derived from the customer's perceived benefit. The margin as the difference between value and costs can then be seen as a potential profit (see for instance Saloner et al. 2000, pp. 129ff, p. 243). An additional model of the market processes might then be used to analyze how the potential profit is divided into the firm's profit and the customer's net benefit.

$$V = V_{i,c} \text{ and } M = V_{i,c} + V_{i,f} \quad (\text{definition W})$$

If one tries to make both definitions equal then the firm's value of the payments $V_{x,f}$ has to be equal to the customer's value of the goods and services $V_{i,c}$. There are two points that illustrate that this equality is not a realistic useful assumption. First, the equality holds if the following two conditions hold. The firm perfectly discriminates the customer; hence, it can extract the full benefit, i.e. customer's net benefit is zero ($V_{i,c} + V_{x,c} = 0$). The fact that 100€ have the same value for the one who gives it away and for the one who gets it ($V_{x,c} = -V_{x,f}$) is the second condition. These two conditions are very restrictive. The first condition is an exception in reality. The second one we pick up in the third part of the article and explain why and how it is violated. Thereby we consider positive costs for the creation of payments and positive costs for collecting it. Another implication of the equality of the willingness to pay and the revenue ($V_{x,f} = V_{i,c}$) is the fact that the customer's partner value is equal to the payment's stream value ($V_{i+x,c} = V_{x,c+f}$). Hence, the customer can capture all value that is created by the stream of payments, and only this. It does not matter if and how this value is created and if financial market imperfections occur. The points both together demonstrate that the equality of both definitions does not seem to hold in general or in the standard case. Therefore, it is reasonable to assume that both definitions of value are usually inconsistent.

$$V_{x,f} \neq V_{i,c} \quad (\text{assumption of inconsistency between definitions R and W})$$

2.2 Comparing both conflicting definitions

In the last section we have presented two conflicting definitions of the term value in the value chain approach. Which is the right one? As stated above, the value determines the activities that are analyzed. The value chain approach suggests some activities that should be analyzed. Therefore, comparing the proposed activities with the activities implied by a definition we might get a hint to the appropriate definition. Additionally, the value chain approach aims to support the analysis of cost advantages and product differentiation. Hence, we can also compare both value definitions according to their ability to shed light on cost advantages and product differentiation.

We first compare the activities implied by the definition of value as revenue. In a next step we do this for the definition as willingness to pay. Finally, we compare both definitions' abilities to identify sources of costs and sources of differentiation.

Activities affecting "value as revenue"

Value chain is also about how to increase the value created by a firm. Defining revenue as the value, thus following definition R, the aim is to increase the revenue. The first idea to increase the revenue is a price increase to collect more payments. But is a revenue increase really caused by a price increase? Are the value activities the origins of the price increase? No. The market process that determines whether the price actually is converted into a stream of payments is not considered in the value chain approach.

Another way to increase the revenue can be derived from adapting the idea of analyzing the customer's value chain and to think about payment-related activities. If we can lower the costs that the customer associates with the creation of the payment, then he might be able to pay a higher price. As above market processes are involved, but are not modeled by the value chain.

Instead of increasing the price, the value of payments can also be increased by decreasing the probability of loss or lowering the costs of collecting the payments, e.g. by enforcing credit card usage instead of a cash or check transfer.

We do not want to continue the enumeration of ways to directly increase the revenue. Most of them are related to market processes, as well as to creating and collecting payments. But, such activities are not explicitly part of Porter's value chain. Other authors that follow the definition R of value as revenue, especially from texts related to e-business, do explicitly address some of these activities. Hence, they extend the value chain. For instance, Zerdick et al. (2000, p. 32) consider the activity class "billing and collection", Skiera and Lambrecht (2001) include the activity "financial transaction", and Meffert (2000, p. 923) integrates the activity class "financing and payments".

Activities affecting "value as willingness to pay"

Which activities are considered if we follow the definition W of value as the willingness to pay? To answer this question, we additionally assume that for a rational customer the willingness to pay corresponds to the value the customer assigns to the goods and services provided by the firm. To increase the value we have to increase the willingness to pay. Hence, we have to increase the value that is associated with the goods and services provided to the customer.

For a search engine the customer's value can be described as we did in Figure 2: "help users to find subjectively interesting content on the World Wide Web". The stream of payments is not considered at all and also market processes are not considered. The activities to be analyzed are only such that contribute to the creation of goods and services. But they do not deal with the collection of payments. An analysis of these activities can either lead to a direct increase in the value of the good and service. This can be based on an increase in quality or adapting the products properties to fit more to customer's needs. Beside direct effects, one can also exploit linkages to the customer's activities. Thereby, an adaptation of the value creating activities might decrease of

customer's costs associated with the absorption of the goods and services. This finally increases the perceived benefit of the customer, hence its willingness to pay. In the example we see that definition W seems to be more appropriate. It addresses the activities we would expect to be relevant for value creation and we do not need to consider activities that are not captured by the value chain.

Definitions' contributions to product differentiation and cost advantages

The definitions of value not only imply a distinct set of activities that have to be analyzed. They also serve as a guide to think about how activities contribute to differentiation and to costs. Differentiation is based on a high value that customers assign to the stream of goods and services. Here the definition of value comes into play.

If the value chain's value is interpreted as revenue then the customer's value of the goods and services $V_{i,c}$ is not considered. This point of view is similar to internal accounting that is not focused on customer orientation and the customers' perceived benefit or its net benefit. If the customer's value is not explicitly considered, then product differentiation becomes difficult to analyze. It becomes even impossible, if there is no revenue at all (e.g. early search engines) or if revenue is sacrificed for some strategic reasons (e.g. penetration strategy for pricing). How can we then analyze product differentiation without rejecting the assumption of value as revenue? Contrary, considering value as willingness to pay one can easily draw the line to the customer's perceived benefit. To increase the willingness to pay a firm has to provide goods and services that have a comparatively high perceived benefit. This definition W of value does not depend on any assumption about prices or payments.

Not only the value is fundamental for the value chain approach, but also the margin. The margin is the difference of value and costs of the goods and services. Because both margins consider the costs of creating the goods and services, both definitions make costs to a subject of analysis. Hence, they both can support analysis of cost advantages. But as we have seen, only the definition of willingness to pay (definition W) can serve as basis for an analysis of sources of differentiation.

A different definition of value implies also a different meaning of margin. Considering value as revenue the margin is profit. More precisely, it is the partner value of the firm. Contrary, considering value as willingness to pay the margin is a potential profit. It is the stream value associated with the stream of goods and services. As explained in the article's first part, both values signal different aspects of firm's activities and of its customer relation. A negative partner value implies that the firm cannot get a benefit from the relation and should therefore cancel the relation. If at the same time the relation has a positive value at all, i.e. the customer's partner value compensates the firm's negative value, then an additional value transfer (perhaps side payments) might solve the problem. A positive partner value does not indicate that the stream of goods and services creates value, but only signals that the combination of the two streams together, goods and services as well as payments, has a worth for the firm or for the customer. If the stream value is negative, then the exchange of goods and services is not useful at all. Such a stream cannot be the primary purpose of a firm. It can only serve as a token for the case that no other way of value transfer is possible (for instance, if a financial trans-

fer is forbidden or too costly). A firm is in a deep crisis if it identifies a negative stream value of the goods and services that serve as the firm's primary purpose.

The appropriate value is the willingness to pay

Summing up the results for the comparison of both definitions, we have to conclude that the willingness to pay is the more appropriate definition of value. First, it better fits to the originally selected classes of activities (see Figure 1). Second, it better supports the analysis of product differentiation. Third, the induced definition of margin is more meaningful for strategic analysis of value creation. The complete ignorance of the payment on the one hand provides a good basis for separating value creation from value distribution. The latter one can be analyzed with tools approaching market forces. On the other hand it does not consider costs caused by activities related to payments. This might be one reason why some authors tend to use the revenue; they cannot accept to ignore payment-related activities in a business analysis. We will remember this aspect in the third part of this article.

After retrieving this theoretical result we want to mirror this to our example: the search engine industry. The early search engines did not have direct revenues from the Internet users. If one values user contacts and interprets these contacts as payments then one might be able to follow the interpretation of value as revenue. A value increase then implies an increase of the number of contacts or of the quality of contacts. This does not directly imply an increase of the quality of the search capabilities. But I would expect that the search capabilities create the Internet users' value of a search engines. Hence, from the practical point of view the revenue does not seem to be the appropriate concept for value. Considering the value as willingness to pay, which for rational Internet users corresponds to the value of the search capabilities, the following questions arise: Can the system localize more web pages? Can it store more information about these pages? And finally, can it increase the mechanisms that match a user request with stored information? But search engines should also ask how they could decrease the complexity of search requests, in general, how to decrease the effort a user must take for finding a web page he is looking for. Anticipating the customers' activities, i.e. considering the value system, and recognizing that many users look for web pages that provide generic content, e.g. news or weather information, the search engines started to provide this content directly. Doing this, the search engines applied the strategy of complementary integration and vertical integration. Summarizing the example so far, the assumption of value as willingness to pay leads to better questions and more explanations than revenue.

This second part of the article has identified two conflicting definition of value. It has discussed both from a theoretical point of view as well as within an example. Definition W, the value as willingness to pay, has been selected as the more appropriate definition.

3 Relaxing implicit assumptions about payment's properties

During the discussion within the previous section we have seen that the payments play a somehow difficult role in value chain analysis. In this third part of the article we want to deal with these payments more detailed. First we will explore an implicit assumption about payments. Then we will show that this assumption is not intuitive and should be relaxed for a firm and business analysis. We propose an extended value analysis.

Further, we present an implication for the analysis of value systems, i.e. vertical integration. As in the parts before, examples from the search engine industry illustrate our line of thoughts.

3.1 An implicit assumption

About the goods and services many authors using the value chain approach assume that the costs of creating the stream of goods and services differ from the value that is assigned to this stream by the customer. This difference is the created value. Usually this created value is positive. Also a common assumption is that there are costs caused by activities related to the creation of the stream. Within the analysis of linkages between value chains, many authors additionally assume that there are costs for activities related to the absorption of the stream of goods and services (Porter 1985, p. 52, Besanko et al. 2000, p. 392). Even if there are no other distortions the costs of creation and of absorption justify the following cost-value assumption.

$$V_{i,c} \neq -V_{i,f} \quad (\text{cost-value assumption})$$

To identify an equivalent assumption for the stream of payments we follow Besanko et al. (2000, pp. 393ff). They intuitively describe the created value as the sum of customer's net benefit and the profit of the firm. Thus they would follow definition W of the value chain's value. Now we do not talk about the value created by the stream of goods and services but talk about the value created by the firm. Relating this to the primary values introduced in the first part of this article, the value creation is given by relation value $V_{i+x,f+c} = V_{i,c} + V_{x,c} + V_{i,f} + V_{x,f}$. But Besanko et. al. later describe the same value as the sum $V_{i,f+c} = V_{i,f} + V_{i,c}$. Thereby, they either focus the value creation to the stream of goods and services or they deny value creation by the financial transfer. This leads to the implicit payment assumption, which implies that the value that the firm assigns to the received payment is the same as the customer assigns to the payment.

$$V_{x,c} = -V_{x,f} \quad (\text{payment assumption})$$

3.2 Discussing the payment assumption

Why do we make different assumptions for goods and services on the one hand and payments on the other hand? I do not know. But I believe that usually there are positive costs of activities related to the collection of payments. Also, there are positive costs of activities related to the creation of a particular stream of payments. Additionally, the specific quality of the payment assumption prevents an application of tools developed for value chain analysis to relations characterized by the exchange of goods and services. Symmetric assumptions would easily provide this opportunity and would also enable to approach an optimization of payment streams using the established tools.

Reasons for different valuations of payments

There are several reasons why a firm's value of received payments differs from the value the customer assigns to the payments. The costs that are associated with the creation of the stream of payments can be positive. This might be caused by positive interest rates if the customer must raise a credit or even by activities related to financial

management. If cost of financial management can partly be traced back to single activities and single customer relations management might be able to improve these activities. On the other hand also the cost of absorption of the payment may be positive. If the firm offers payment by installments then the firm might not completely recover the costs from the customer. There are not only costs of the primary activities related to payments. There can be huge costs for the development of payment-related technologies.

The more positive the described costs are the bigger is the difference in the valuations of the payment. If there are only costs but no other distortion then these costs represent value destructions. On the other hand imperfect capital markets can lead to a value creation just by the payments, but such imperfections might also increase the value distortion. I suggest that, if there is no other information, one usually can assume that paying the price destroys value, even if it is very small. But such small losses can be important if the value created by the transfer of goods and services is comparatively low, too. If we are now convinced that costs of activities related to payment matter, then we can refine our payment assumption as follows:

$$V_{x,c} \neq -V_{x,f} \quad (\text{refined payment assumption})$$

An Example: Search engines and the refined payment assumption

Now that we have changed our payment assumption based on theoretical reasons we want to see if this is empirically plausible. Consider the relation between an Internet search engine and the Internet user. If the user has to pay for each single search request, then very small prices are necessary. But the billing and collection of these micro payments has been an unsolved technological challenge. For the early search engines therefore the costs of billing and collecting such micro payments have been so high that such business models were omitted. Despite the search engines did not receive revenue from the Internet user, they have had a strong interest in keeping the relation to the Internet user. How can a value chain analysis capture such issues? It is best approached with the refined payment assumption. Thereby we get symmetric assumptions for the stream of goods and services and for the stream of payments. Doing this we can generalize and consider two inversely directed streams of goods and services. The Internet users create a stream of attention. This attention has to be collected and qualified by the search engine. Finally this stream of attention is sold to advertisers. Taking this point of view, we can analyze and probably optimize how the search engines absorb attention and how these activities contribute to costs. We can also ask how this attention is created and try to exploit linkages. With linkages I do not only refer to links between activities of the search engine and the Internet user, but also to links between activities of the stream of providing search capabilities and the stream of capturing the user's attention. Perhaps we can link both streams in a unique way; hence build up a competitive advantage.

3.3 Proposing an extended value analysis

Being convinced that aspects like costs of creation and absorption of payments matter and that the refined payment assumption is useful for a practical value analysis too, what does this mean for a value chain analysis? First of all, it implies that even a positive margin of the classical value chain does not imply a profitable business. Or the other way around, a value chain disturbing value might be compensated by a value

creation caused by the financial transfer. Additionally, a firm not only has to identify linkages between the value activities of a firm, i.e. production, and the activities of its customer, i.e. absorption, but also linkages between activities related to the production and absorption of the payment. We now see that the value chain analysis is just a part of the business (model) analysis. It has to be supported by an analysis of the payment chain and the related activities.

To extend the value chain analysis, I propose an analysis as visualized in Figure 3. Activities of Porter's original value chain can be found in the upper left box. The upper right box contains activities that are from the customer's value chain. The lower boxes contain activities that are related to the stream of payments. The extended value analysis is based on an analysis of activities' contributions to the four primary values. We need four instead of value chain's two values (cost and value), because we consider the refined payment assumption. Thus, we have to analyze if value is created or destructed by the payment chain.

Based on these four primary values one can analyze the how the value creation of a stream (stream values) can be increased. This is the fundamental question for the creation of a sustainable competitive advantage. The stream values signal whether the stream creates values or destructs it. If the latter happens, the stream might be cancelled and replaced by a simple financial transaction. The analysis of the partner values, i.e. the customer's net benefit and the firm's profit is a good starting point for identifying potentially risky customer relations. If the net benefit is small then small changes in the customer's costs can lead to losing this customer. A small profit implies that small changes in the firm's costs can make the customer relation unprofitable. We see that the extended value analysis provides different values depending on the question that is asked.

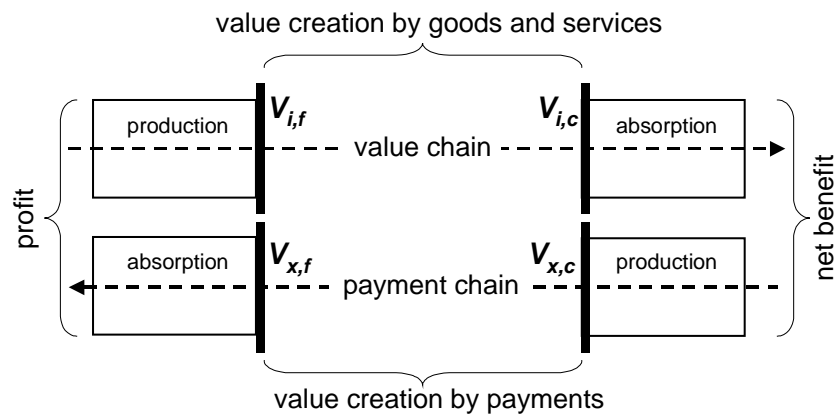


Figure 3: The extended value analysis

The extended value analysis has symmetric assumptions for the stream of goods and services on the one hand and for the stream of payments on the other hand. This enables a generalization. We can interpret the stream of payments as a general stream of goods and services provided by the customer. Doing this we can apply all tools usually applied to the stream towards the customer now to the stream towards the firm. This means that we can also ask how to exploit linkages between the payment-related activities of the

firm and of the customer. For instance, if the interest rate for the firm is lower than for the customer, then the switch to payment by installments can increase the value $V_{x,f+c}$ without any affect on the stream of goods and services. This additional value might be distributed between firm and customer, i.e. increasing the customer's net benefit or increasing the firm's profit. The design of the price as well as of billing and collection mechanisms is now embedded into a classical value chain analysis.

But not only linkages between payment-related activities provide new sources of competitive advantage, but also linkages between activities of both streams. The integration of the stream of goods and services with the stream of payments can be a source of a sustainable competitive advantage. For instance, there might an incentive for a particular way of delivering the goods and services that has comparatively high costs, because it lowers the costs of collecting the payments. Making these linkages a subject of analysis is an important aspect of the extend value analysis.

If we can generalize the extended value analysis and analyze two inversely directed streams of goods and services, then we are also able to analyze relations that are not characterized by paying a price for something, but that are instead characterized by the exchange of something. In the example about the search engines we were able to talk about the relation between the search engines and the Internet user, despite there is no pricing at all.

Excuse: Combining both streams in to one stream

It is not the first time that the activities regarding the payment are considered. As mentioned earlier, several authors dealing with e-business have introduced new classes of activities into the value chain: payment-related activities. The question that arises is for instance, how does billing contribute to the value of some good or service? They only do so, if the stream of goods and services and the stream of payments are combined into one. Doing this we lose the ability to think about the linkages of activities related to different streams. Also the definition of value and costs becomes somehow difficult. What are the costs of creating a stream the firm receives. We then have to cheat and think about creating the option of receiving something. But this does not seem to be appropriate for managers.

3.4 Implications for vertical integration

Until now we have focused on the analysis of a single firm and its customer. Putting the firm into the context of its value system as defined in the introduction, we can analyze its position regarding vertical integration. A value system analysis is about all activities enabling the flow of goods and services from the raw material to the final consumer. If we extend the value chain analysis we also have to extend the value system. Considering the additional stream of payments, we realize that the vertical integration can be different on both streams. For instance, the management of goods is done via direct contact between firm and customer, while the billing and collection of payments can be outsourced to a third firm. Figure 4 illustrates this situation. Our extended value analysis now shows that we have also to look at linkages between the stream of payments and the stream of goods and services. If both streams cannot be decoupled then

the mentioned intermediation is not possible or causes even more costs. For a value system analysis, it is of great importance to realize how the two streams are interconnected.

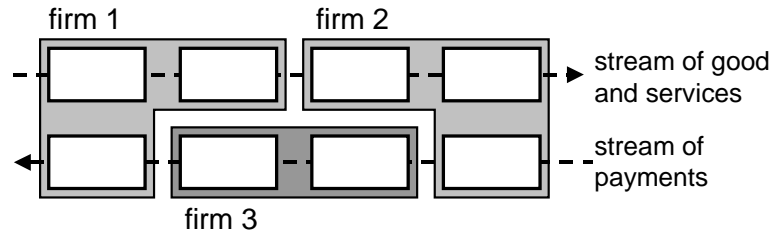


Figure 4: Different vertical integration for the stream of goods and services and for the payments

Regarding the analysis of a value system Saloner et al. (2001) and also Porter (1985) state that the value that is created along the value system is distributed among the firm participating in the value system. Usually market power is the key factor for gaining a big share of the value. As we see that the integration and technological management of the payment chain can be a difficult task, which can even prevent some business models, technological question are also crucial factors for value distribution. They can enforce specific patterns of profit distribution among the members of a value system.

4 Conclusion

This article discussed two questions related to the value chain analysis. It shows that there are two usually conflicting interpretation of the value: revenue and willingness to pay. Both were analyzed according to the activities they are related to and according to their support for the identification of differentiation and cost advantages. Because the willingness to pay is better according to both aspects, it is the appropriate interpretation.

Additionally, we have shown that the value chain analysis often makes counter-intuitive assumptions about the stream of payments, i.e. zero costs of payment-related activities. We demonstrated that – as accepted for the stream of goods and services – also for the stream of payments there are costs of production and costs of absorption. These costs as well as imperfect capital market can cause a value creation or value destruction just because of the financial transfer. Hence, in an extreme case the financial transfer might become the primary purpose of the firm, having the stream of goods and services only as a token. Or it can lead to the failure of a business model.

Therefore we proposed an extended value analysis, which additionally considers the stream of payments. Based on the refined payment assumptions we can generalize the extended value analysis. This enables an analysis of relation characterized but mutual exchanges of goods and services. The extended value analysis has also some implications for a value system analysis. The interconnection of the stream of goods and services and the stream of payments is an important question for different kinds of vertical integration. These linkages between both streams can be a source of competitive advantage or even the reason for a failure although there is a positive value chain.

Future extensions of the value chain should keep the different interpretations and purposes of value definitions in mind and should explicitly address the payment assumption.

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