Towards the design of electronic business models

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The design of business models is a mission critical aspect of entrepreneurship, not only in the so-called Digital Economy. A multitude of business models was developed in the hope on later exorbitant user numbers and profit margins. The hopes have not confirmed themselves for a large part of the firms because the interests of the various participants of the value creation network were not appropriately considered and communicated.

This paper proposes a model to formalize and analyze the participants of the value creation network, the relationships between and the value potentials the business model offers. The proposed model comprises three interrelated views: the architecture view, the transaction view and the value potential view. While the architecture view describes the involved participants, their roles and the different flows between them, the transaction view shows a typical transaction for this specific business model. The value potential view explains the potential value, monetary as well as not monetary, that can be generated for each participant. By defining constrains for this model consistency aspects can be systematically included. The usage of this model when designing a business model can help decision makers to get a more integrated view and to avoid too much concentration on single aspects and therefore neglect others.

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1 Introduction

The development of sounding business models for the commercial usage of the internet is a non trivial task with a commonly agreed high importance for the success of an enterprise. Especially advertising financed models have shown great problems in realizing the expected revenues that where not easy to correct, even by a short time change in the revenue sources. A current example is the storage provider Freedrive, Inc., who offered its users the usage of an amount of virtual disk space free of charge. As many other providers, this one was taken over because of revenue problems by a competitor, Xdrive Technologies. Xdrive Technologies announced not to continue the "free" Freedrive business model (Xdrive 2002).

The existing approaches focus on selected aspects business models, especially the customer value. The motivation of the other participants, especially of partners and stakeholders, are often not appropriately considered. Another problem is that the missing compatibility of the approaches makes an integrated consideration difficult. The results are inconsistent business models – value potentials and architecture are not connected together, a systematic alignment of the revenue sources on the offered value potentials is difficult.

The scientific research gives only little methodic help for designing business model. Not even a commonly agreed definition of what a business model is or what it includes exists (e.g. Osterwalder, et al. 2002, p. 1).

This article proposes a model which allows an integrated description of an electronic business model, its participants, the relationships between the participants and the revenue potentials. It can be used for business model design helping decision makers to visualize and check basic aspects of a business model. Defined rules help to check the formal consistency of the model.

Users of this model could be on one hand capital partners as well as potential business partners analyzing a presented business model. On the other hand it can give clues to internal management for design and improvement of the current business model. Furthermore it can be used by researchers to describe business models and as a foundation for further research.

First the paper gives an overview about existing definitions of business models and the understanding of business models used in this paper. After this an approach for a description model is presented. To illustrate the usage of the model an example will be given by the business model of Priceline.com. The paper closes with a conclusion and an outlook of potential further research.

This paper was been written within the scope of research to take the doctor's degree of Steffen Breuer and is therefore positioned as research in progress.

2 Basics of electronic business models

2.1 Definition and mark off

The term „electronic business model“ or „e-business model“ is often used as a buzzword. In scientific literature are many different opinions about what business model means respectively what it consists of. A lot of authors don't even define the term (Timmers 1998, p. 2, Osterwalder, et al. 2002, p. 1). The existing definitions cover a broad range from unspecific to very specific. This shall be illustrated by the following selected examples:

Rappa defines a business model as in the most basic sense the method of doing business by which a company can sustain itself – that is, generate revenue. The business model spells out how a company makes money by specifying where it is positioned in the value chain (Rappa 2002). Rappa identifies nine categories of business models with subcategories and describes them verbally.

Another approach to mark off business models was given by Q. Dickson, director of the U.S. Patent and Trademark Office. He distinguishes between a business model as a general vision or strategy and a business method, which is a specific way of doing business (Ovans 2000).

Pigneur suggests to adopt a definition from (Hagel, Singer 1999), which emphasizes that a business model has to address the issues of product innovation, customer relationship, infrastructure management and financial aspects (Pigneur 2000, p. 2). The paper suggests a framework to analyze business models using four components: Product innovation, customer relationship, infrastructure management and financial aspects (Pigneur 2000, p. 4; Osterwalder, et al. 2002).

Tapscott uses the term b-web to describe a system of suppliers, merchants, e-commerce service providers, infrastructure providers and customers using the internet for the major part of their business communication and transactions (Tapscott, et al. 2001, p. 29). The focus lies especially on controlling the b-web and the value integration given by the business models. The value potentials for the different participants can be products, services and revenue as well as information and immaterial advantages.

Timmers defines a business model as an architecture for the product, service and information flows, including a description of the various business actors and their roles, a description of the potential benefits for the various business actors; and a description of the sources of revenues (Timmers 1998, p. 6). Timmers identifies ten categories of different models by using the dimensions functional integration and degree of innovation. The description of the models is

made verbally, structured into the sections business-customers-competition, marketing strategy and marketing mix (Timmers 2000).

Based on the understanding of Timmers Weill/Vitale define an e-business model as a description of the roles and relationships among a firm's consumers, customers, allies and suppliers that identifies the major flows of product, information, and money, and the major benefits to participants. The flow of money in the definition given by Weill/Vitale indicates a payment in exchange for goods, services and information (Weill, Vitale 2001, p. 39). To better classify the different business models they divide the overall model of a company into one or more atomic business model that are combined to so called e-business initiatives (Weill, Vitale 2001, p. 34). Weill/Vitale analyze the strategic objectives and value propositions, the sources of revenue and the critical success factors of the different business models. They use a graphical scheme to describe the architecture of the models consisting of icons for the participants, flows and relationships. The relationships in their model are divided into physical and electronic relationships.

Österle uses the term "business model of the information age" for a business structure built around specific customer processes. The entities of this model, customers and enterprises offering goods and services to support a specific customer process or generic e-services, use for their collaboration a standardized infrastructure, the business bus. The major aspects of the model include process efficiency as well as trends in the transformation of enterprises (Österle 2001).

As many others these definitions focus on different selected aspects of business models but lack on an integrated description of the different aspects they include (Lindner, Cantrell 2001, p. 3). They don't give rules or hints how to assure the completeness and consistency of the examined business models.

While the definitions of business models and their parts are quiet different, the sense of building such models seems to be the same in most publications, assisting in decision processes how to design and evaluate strategic opportunities.

The definition of a business model used in this paper therefore shall be a model consisting of the participants, their roles and the flows between them as well as the value potentials and their sources on a high aggregated level. A business model describes a business network from the point of view of a specific, the focused, network participant. This can be an enterprise, a business

unit or another organizational unit whereas it not necessarily has to be formally or legally marked off. A business model in this sense focuses on the flows between the different participants and therefore takes an organization-external point of view.

This article focuses on electronic business models. An electronic business model is defined as a business model whose major flows are executed using electronic networks, especially the internet.

2.2 Defining the business web

A specific role using this definition plays the marking off of the relevant business web from the other business environment. It has to include the focused enterprise as well as the customers. A customer is defined as a participant of the business network that takes the output of the network, for instance a car in a network focused on a car manufacturer as General Motors. This can be a business customer as well as an end user. A number of publications use the term customer only in the meaning of end user. The problem with this kind of view can be illustrated using the example of a manufacturer producing standard screws used in the car industry. If he would try to design his business model and include the end user into this consideration, he would have to model a lot of relationships between the car manufacturer, the car dealer, tier—one manufacturer and others that he can't influence therefore generating little additional decision support how to design his role.

Beside the customer and the focused participant the business network has to include other participants. They represent a part of all stakeholders of the focused participant. For determining the participants to include the principal rule should be to include all these partners and customers with their relationships which can either be controlled or at least influenced or which have an important meaning for giving decision support, e.g. the success of an advertising company depends on a special relationship between a content provider and its customers.

To choose its own position in a business network a company should try to analyze different network possibilities and to establish a position of maximum influence in the network offering the greatest potential (Österle 2001, p. 21).

2.3 Requirements for the description model

The requirements for a description model base on the question, why it was build. As said above, the aim of this model is to give an integrated view of the different aspects of a business model and rules that can be tested to check the consistency of this model. Beside the implicit consistency rules it should give the possibility to formulate other design rules for business

models, e.g. heuristic rules how to design the value potentials. There should also be the possibility to enhance the model by other elements or rules without the need to change the basic structures.

Because a business model can be used by a company as well as by a business unit the description model must be flexible enough to handle these different levels. For a broad usability it should be sector-neutral.

3 Approach for an description model

3.1 Overview

The different schematics provided by (Weill, Vitale 2001), (Tapscott, et al. 2001) and others show the difficulties trying to integrate the different aspects of a business model into a one view model. Therefore the proposed model uses three views. The integration between the views is made via implicit modeling rules.

Figure 1 shows the basic structure of the model in a cube view.

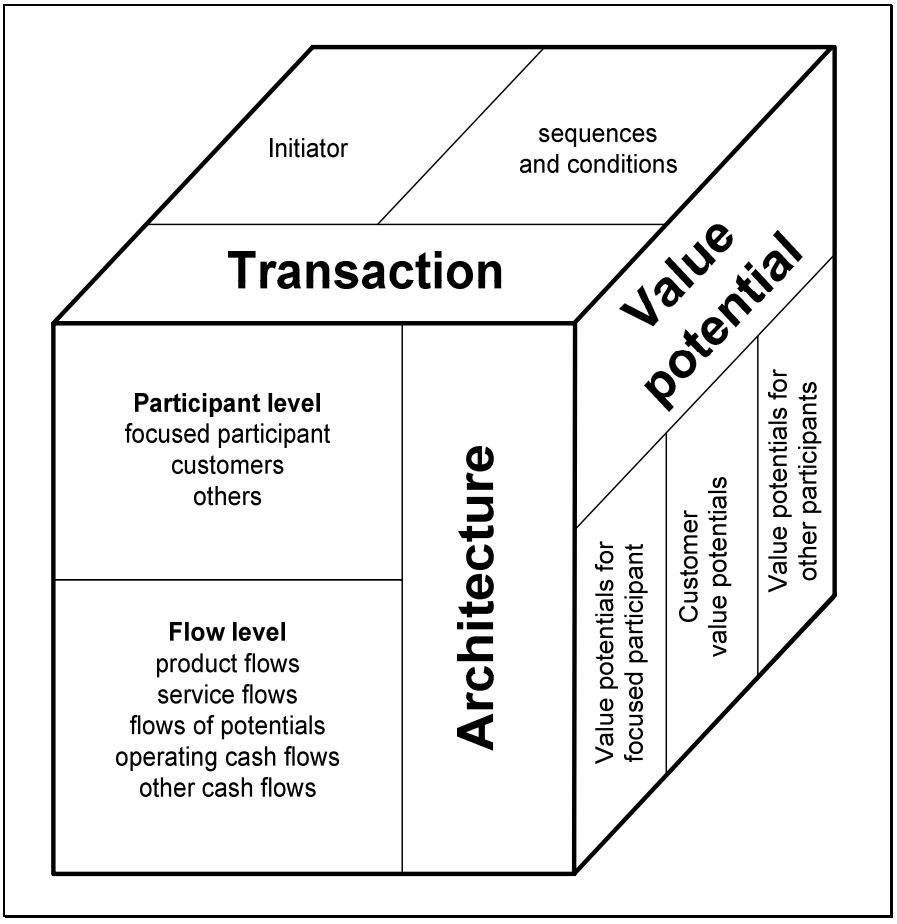


Figure 1 basic structure of the description model

The model consists of the architecture view, describing the various participants and the flows between them, the value potential view, showing the value potentials that can be realized by the

participants and the transaction view, presenting the major aspects of a typical transaction. Each of these views includes one or more levels to categorize the information. The elements of the different views are represented using a set of symbols. Figure 2 gives a summary of them.

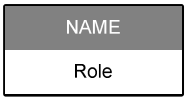
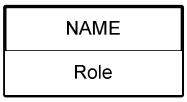
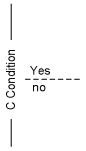
Element	Symbol	Explanation
Focused participant		Represents the focused participant and the role he plays in the business network e.g. a broker
Other participant		Shows the name and role of other participants, e.g. customers or suppliers
Product flow		Flow of products, designed to be sold in exchange for revenue (e.g. a car)
Service flow		Flow of Services, usually designed to be used in exchange for revenue (e.g. consulting services)
Option flow		Potentials give the right to someone to use or not use an option (e.g. to buy a product during a limited time for a discounted price)
Operating cash flow		Flow of money generated by operating activities (e.g. revenues), most often paid with cash, rarely with securities (e.g. supplier warrants)
Other cash flow		Flow of money generated by non-operating activities, especially financing and investing activities as reported in consolidated cash flow statements (e.g. CommerceOne 2001, p. 41)
Information flow		Flow of information that not represent a product or service, used to support the selling of products or services (e.g. information about a car)
Condition		Important condition in a transaction sequence (e.g. changes of a price of a booked flight between booking and paying result in canceling and a new offer)

Figure 2 Elements and associated symbols

3.2 The architecture view

The architecture view contains information about the various actors and their roles in the business web. The levels of the architecture view are the participant level of the business network and the flow level, describing the flows between them.

The participant level usually consists of

- The focused participant
  As described earlier the focused participant can be a company, a business unit or another organizational or legal unit. This is the participant who stands in the center of the examination and the people building the business model typically belong to this participant.

- The customer(s)
  A customer is defined as a participant who takes the main output of the network, typically in exchange for money. The output of the network doesn't have to come directly from the focused participant. A car broker like Auto-by-tel would provide broking services but the main output of the entire business network would rather be the car itself.

- Other participants
  Other participants are entities with one ore more existing flow between them. This includes not only supplier but also allies, provider of e-services and others. The question how to define the business web was addressed in section 2.2.

The flows between these participants can be of different types. These types could be product flows, service flows, option flows or information flows as well as operating cash flows and non operating cash flows. The first four types represent offers that a company makes to its customers, whereas the operating cash flow usually represents the revenue generated in exchange for the products, services or options. The free operating cash flow is often used as a base for valuating a company and its business model from the view of an investor (Desmet 2000). The necessity to include the other cash flow into consideration comes from analyzing the cash flow statements of e-business companies, e.g. Commerce One (CommerceOne 2001, p. 41). The analysis shows, that the other cash flow as defined on the page before is sometimes very much higher than the operating cash flow. Because some companies lack on generating enough revenue to maintain their business model, they are sometimes financing its activities issuing stocks or warrants to its partners and suppliers. If these other cash flows would not be integrated into the model it seems difficult to explain why these companies are still in business.

3.3 The value potential view

The value potential view describes the value potentials that the business models offers. This view includes monetary as well as non-monetary advantages. It does describe value potentials rather than specific values because the value experience and the esteem for an offered value position can differ between the individuals even for the same offered value potential.

The levels of the value potential view differ between value potentials for the focused participant, the value potentials for the customer and the value potentials for other participants, e.g. partners and allies.

3.4 The transaction view

The transaction view is used to show the major aspects of the one of few typical transactions of the business model. This doesn't mean to describe the different processes because the business model has been defined as being on a highly aggregated level. It is therefore used as a foundation for the implementation of business processes (Osterwalder, et al. 2002, p. 1).

A transaction in this context is meant as a sequence of flows between the participants. The importance of examining the transaction sequence lies in the possibility to differ e.g. between prepaid and post-paid models, known for instance from mobile communication providers. It also makes it possible to examine the specifics of built-to-order models (e.g. personal computers by Dell (Kraemer, et al. 2000)) versus pre-manufactured models (e.g. personal computers by HP). These sources for differentiation between business models and for value potentials cannot be explained using only the architecture view and the value potential view.

The levels of the transaction view include the initiator and the transaction sequence. Every transaction is initiated by a participant of the business network. An initiating event could be an order made by a customer or a contract between business partners.

The transaction sequence contains the individual flows between the participants and, if necessary, major conditions that determine if a partially sequence is executed or not. The priceline.com business model gives an example for such a condition (see Figure 4 on page 15).

3.5 Formal constrains of the description model

A number of checks can help to assure the formal consistency. This includes especially checking if it is formal complete and if the views are integrated.

Rules to check formal completeness:

- The model includes one focused participant and at least one customer. The business model is designed around the focused participant. A business model without participants in the role of customers wouldn't make sense because there would be no possibility to generate revenues.
- Every participant is connected to at least one other participant by a flow. This means, that entities (e.g. partners) without incoming or outgoing flows are not part of the business network and therefore have to be excluded.
- The customer has one or more outgoing flow to another participant. The role of customer implicates that a performance (product or service) is taken in the exchange of money or another comparison. Therefore one of the participants must have an incoming revenue flow by the customer. If there is no evident revenue flow issued by the customer, e.g. in an advertising based model, the designer should check the model if the role of customer is appropriately set and if every relevant product or service flow is included.
- The focused participant has at least one incoming cash flow and one or more outgoing performance flows (product, service or potential). To represent the business of the focused participant appropriately, the business model has to show the output he generates for the other participants. The incoming cash flow represents the revenue sources of the focused participant and therefore the basis of long term financing.
- Every transaction sequence in the transaction view is initiated by a participant. A transaction sequence cannot run without an initiating event. The participant where the event occurs decides when and how often the transaction sequence starts.

Rules to check the integration:

- The value potential view contains value potentials for all participants. As already stated out in the introduction, many authors concentrate their objectives mainly on customer value. This rule means that for every participant in the architecture view must be a value potential, because otherwise there would be no reason for him to join the network.

- The transaction view contains a sequence of flows consisting only of flows and participants used in the architecture view. This means, that there can't be a flow or participant engaged in a typical transaction sequence without being considered in the architecture view and in the value potential view (see the rule above).

These rules should be understood as giving a frame for a formal correct description model. They don't implicate questions like if the product is worth the expected revenue because this depends on the concrete situation.

4 The example Priceline.com

4.1 Verbal description of the business model

The information regarding the business model of Priceline.com are the result of analyzing the filings available at the EDGAR-Online Archive of the Securities and Exchange Commission at http://www.sec.gov/cgi-bin/srch-edgar and the website of the company, available at www.priceline.com.

Priceline.com is a demand collecting intermediary that uses a special pricing mechanism "name your own price". To better illustrate the usage of the description model this section focuses on the air travel activities, where most of the revenue is generated. Other revenue sources are domestic travel and together with partners mortgage and advertising fees.

Reversing the traditional pricing concepts Priceline.com gets an offer by a potential customer for a product or service the customer wants to buy. This offer includes a frame, like date and destination of a flight and the price the customer is willing to pay. The customer can't include a specific airline or a time into the offer. This means the customer must be flexible (Priceline.com 2002). A customer offer is recognized as valid if it is not more than 25% lower than the lowest price an airline asks. The offer must be secured by a credit card and the customer agrees to hold it valid for a specific time, depending on the product and usually several days. If a deal is closed in that time, the customer must accept the deal regardless which airline will execute the flight.

If the offer is valid, Priceline.com checks in a contingent of flights made available by the partner airlines if there is a carrier willing to do the transport for the offered price. If yes, the deal is closed between Priceline.com and the customer. At this time the customer gets to know the airline and the flight times. Once the deal is closed the flight can't be cancelled, neither by the customer nor by the airline. If the offer is not acceptable, Priceline.com can make one counter offer to the customer.

The revenue Priceline.com earns is recognized as the difference between what the customer pays and what the airline charges.

4.2 The views of the business model

Figure 3 shows the architecture view of the business model. The different airlines provide a contingent on available flights. If a deal is closed, one of these airlines gets paid by Priceline.com and delivers the flight to the customer. In this model, the end customer is in the customer role, making this a Business-to-Consumer model. This view shows that Priceline.com uses a direct revenue mechanism. That means it gets the revenue directly from the participant in the customer role. An indirect revenue mechanism would be possible, if the customer would pay directly to the airline and the airline would have a cash flow to Priceline.com.

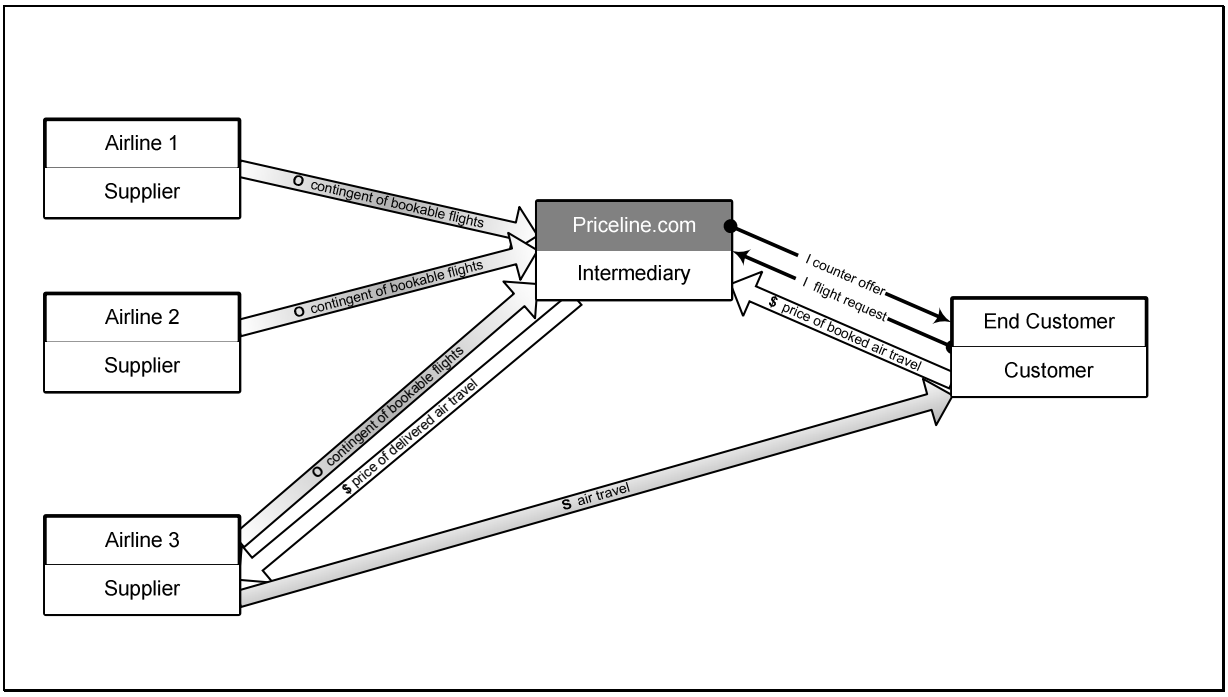


Figure 3 Architectural view of the priceline.com model

The motivation for priceline.com to implement this business model is revenue generation. The revenue is recognized as the difference between the price paid by the customer and the price paid to the airline. If there is more than one airline with an acceptable flight for a customer offer this allows Pricline.com to choose one of them thereby adjusting the margin or preferring selected airlines.

The transaction view, presented in Figure 4 includes two conditions beside the flows between the participants. The first one is used to assure that an offer is valid and the customer shows real interest in an order. The second one determines if an order is accepted and therefore if the deal is executed or a counter offer is made. The vertically display of the flows following the second condition indicates that these flows can be executed simultaneously.

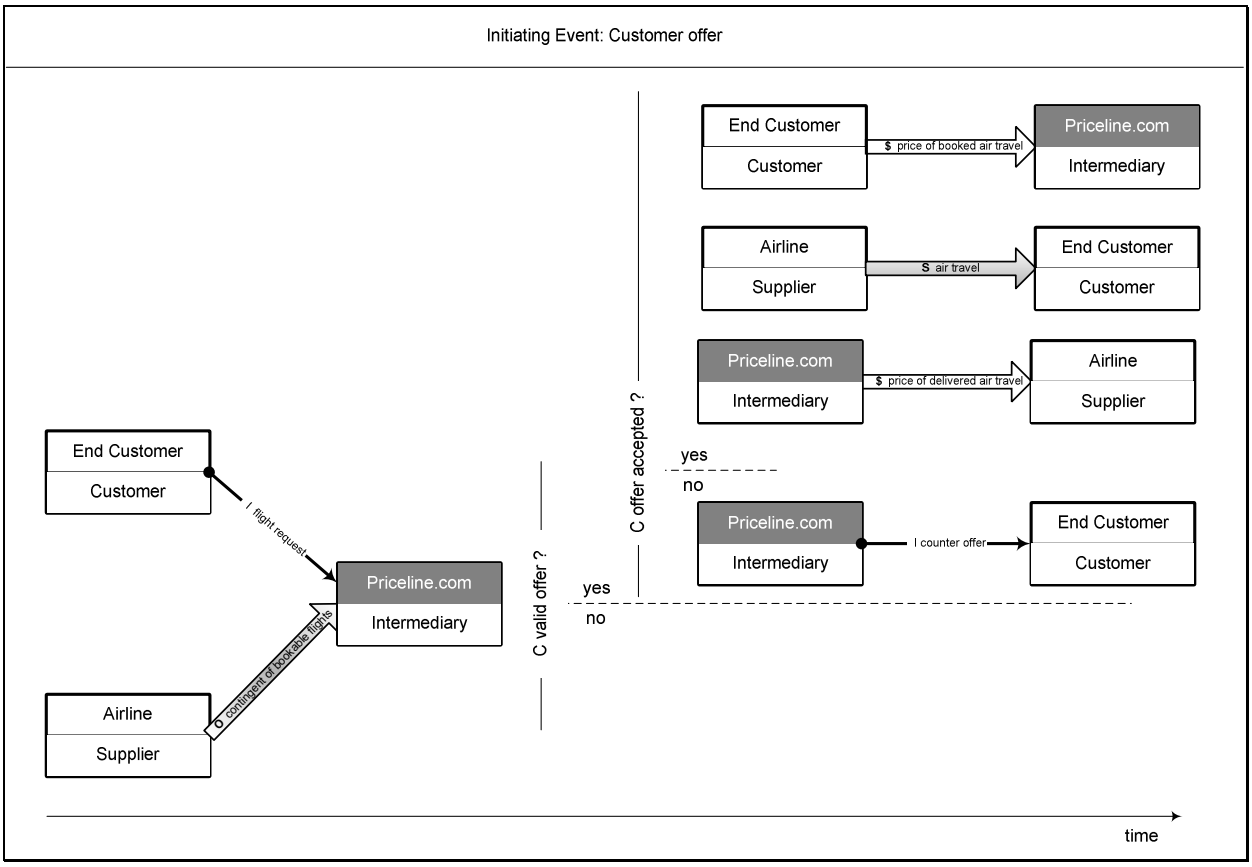


Figure 4 Transaction view of the priceline.com model

The value potentials the business model offers to the customer especially lie in the possibility to get a lower price for being flexible. Also, he can name his own price instead of taking a price offered by a travel agency. If the offer cannot be accepted, he don't need to try it another time hoping to get a flight, which takes him every days of holding time between every try, he gets a counter offer with a price that he can accept.

The value potential view is shown by Figure 5.

VALUE POTENTIALS
Focused Participant: Priceline.com • Revenue, recognized as difference between price for booked flight and price for delivered flight • Adjustable margins if more than one possible flight for a specific customer offer is in the contingent
Customer: End Customer • Can name their own price instead taking retail prices • Can try to get lower prices when flexible • Aggregated supply because of many participating suppliers • If the offered price is "reasonable", but not accepted, they will receive a counter-offer for the selected package.
Partners: Airlines • Aggregated demand • Better capacity utilization • „Brand shield" – suppliers can offer flights and avoid „free riders" (customers, that would pay more for a flight but take an offered discount) to reduce channel conflicts and protect official retail pricing structure • Customers can't compare retail prices • Airline and flight time opacity and cancel policy protect premium pricing for business travelers • Offers secured by credit cards

Figure 5 Value potential view of Priceline.com

The value potentials offered for the supplying airlines are once the better usage of their capacity through the demand aggregation Priceline.com provides and because of the flexibility of the customers.

The more important part is the "brand shield". In a travel agency it would be easy for a customer to compare catalog retail prices. Customers that were willing to pay even a higher price would

choose a bargain if offered in the catalog. Because the user in this model doesn't know the prices and the contingent of the flights an airline has, he can't compare the prices. This helps to avoid channel conflicts. Because a flight once booked cannot be cancelled and the customer agrees to be flexible in flight times, this service can hardly be used for business people, therefore protecting the high margins that airlines generate with them. The fact that the offers must be secured by a credit card avoids fake offers. The most important disadvantage of the business model for the airlines is the danger that Pricline.com could prefer specific providers to increase their own margin.

5 Conclusion

The design and implementation of business models is a central problem in electronic business. But neither a commonly agreed definition of what a business model is and what it consists of nor models to systematically describe business models exist.

This paper presented the approach of a description model integrating different aspects of business models into three different views. The elements in these views are represented using special symbols. The architecture view describes the different participants, their roles and the flows between them. The value potential view shows which value potential the business model can offer to the different participants of the business network. The transaction view gives an overview of the basic sequence of flows in a typical transaction. A number of consistency rules can be used to assure the integration between the different views.

Possible usage areas could be on one hand the presentation of a business model to venture capitalists or partners to encourage them to collaborate. On the other hand people responsible for designing business models can get an overview of an existing or planned business model and by testing the rules find possible weaknesses or inconsistent elements. This model doesn't give hints how to implement a designed business model in the reality. Further it is not intended to explain if and why a company using a specific business model can be successful.

For the scientific user the structured description of business models allows a systematic comparison of different models to categorize them and for testing of hypothesis.

Further research could be done based on this description model in different areas. One possibility is the enhancement by different kinds of flows. Another possibility could be to enhance the transaction view by other elements needed to structure them that are necessary beside flows and conditions using constructs known from workflow management.

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