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## E-BUSINESS UND ENTREPRENEURIAL COOPERATION

### A New Customer-oriented (E-)Business Modeling approach validated in the case of a collaboration network in the German Manufacturing Industry

#### ABSTRACT

Nowadays, the Internet and web-based E-Business solutions play a crucial *enabling role for the design and implementation of new Business Models*. This implies high chances, but also remarkable risks for enterprises that have to face choice and adoption of a Business Model. As a matter of fact, the development and implementation of a strategically not appropriate Business Model would crucially undermine the long-term success of a company in the global market arena. Therefore the clear *need for action* in the field of methodical Business Modeling. Our contribution presents a new approach for a *customer-oriented (E-)Business Modeling* [7], with a specific attention on entrepreneurial cooperation. The approach had been validated for a collaboration network in the German manufacturing industry.

#### BACKGROUND

During the past years, the fast development of new Information and Communication Technologies (ICTs) has been revolutionizing the market arena and it extended the horizon of competition [4]. Such development has been causing radical changes in all business branches [9]. New ICTs and the related new business approaches allow enterprises to design leaner *intra-organizational* processes, with the result of enhancing higher efficiency and productivity [11]. Besides that, ICTs can strongly influence *inter-organizational* processes, by supporting *cooperation* within *entrepreneurial networks* as well as by enabling their *coordination* – by means of Internet-based Business Collaboration Infrastructures [9]. Hence, web-based ICT solutions play a crucial *enabling role* both for new Business Models and for those models that, up until now, had a higher value on a theoretical than on a practical level (e.g. Virtual Organizations) [6].

As far as inter-organizational processes are concerned, recent trends showed that companies, in order to face the quick-paced globalization process, tend to concentrate on the own core competencies, before starting to cooperate within global networks of enterprises [4]. This transformation process is crucial for the success of the company's business. Therefore, before making a strategic decision regarding the participation to a cooperation network, the management of an enterprise has to take into consideration a wide set of aspects, such as the

entrepreneurial organization, the own core competencies, the needs of the customers, the readiness of the potential partners to cooperate, and the availability of the needed technologies and tools [4] [6] [9]. As a result, in order to deploy innovative *network-oriented cooperation structures*, new (Internet-based) Business Models can be designed and successfully implemented [1].

#### NEED FOR ACTION IN BUSINESS MODELING

The core objective of each company is a long-term creation of *added value* [6]. The entrepreneurial *strategy* defines how such a target has to be fulfilled. A successful strategic positioning is achieved through a sustained profitability, an own value proposition, a distinctive value chain, an entrepreneurial fit, and continuity of strategic direction [6]. According to our understanding, a *Business Model* is an *instantiation of an entrepreneurial strategy related to a specific business* and it encompasses: market (customers and competitors), outputs, revenues, production design, partner network and financing (see Figure 1).

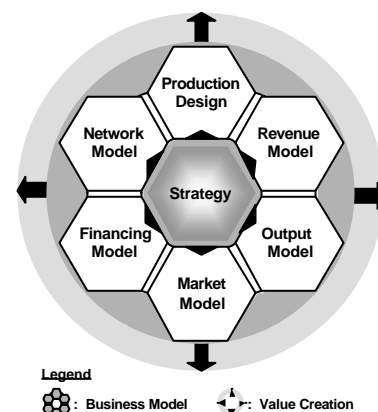


Figure 1: Strategy, Business Model and Value

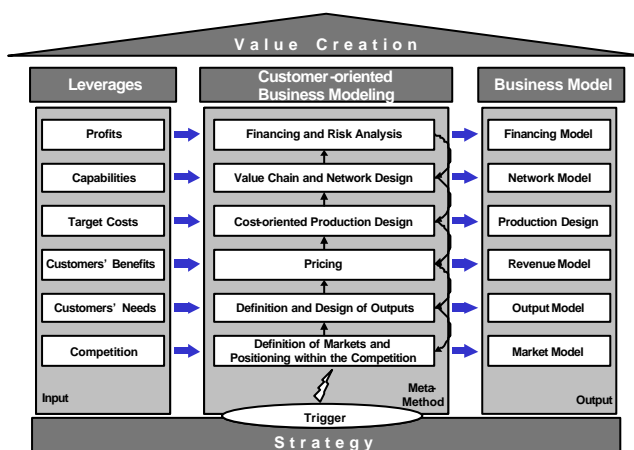
In the management literature there are different and discrepant definitions of the concept of *Business Model* [1] [9] [11]. Furthermore, (E-)Business Models can be classified according to the most different criteria [8] [9] [10] [11], such as the degree of innovation and functional integration, the collaboration focus or the involved actors. In the new ICT era, companies strive to exploit the advantages of the networked economy. Lately, Business Models tend to involve different enterprises with the goal

of bringing higher profits to each of the participants. The modeling of such cooperative E-Business Models represents a significant challenge, since there are no appropriate methods to tackle systematically such modeling issue. Goal of this contribution is hence *to present a systematic approach to develop and adopt a sustainable Business Model*.

### CUSTOMER-ORIENTED BUSINESS MODELING

Due to the globalization, the growing transparency of the markets and the resulting increased competition, enterprises have to focus more and more on their customers. As a matter of fact, the fulfillment of the customers' needs is an essential precondition to generate turnover. This means that enterprises have to take this aspect into deep consideration and must consequently shape Business Models that reflect the customers' needs. In the product design, a well-proven method is the Quality Function Deployment (QFD). With this approach, a customer-oriented product development can be successfully realized. Because of the above-mentioned reasons, up until now the development and adjustment of Business Models has been performed by companies mostly in a creative way. As a matter of fact, in the state-of-the-art there is hardly any available methodical support. We are therefore convinced that a successful approach to tackle this methodic lack must be based on a strategic focus on the customer's needs.

Within a running research project, we have been developing the *House of Value Creation (HVC)*, a method to design customer-oriented and sustainable Business Models (see Figure 2). The HVC is a meta-method, since it consists of *three logical pillars* (input, method, and output) and of *six process layers* (each of the process steps requires a suitable method). The method suits explicitly the design of Internet-based Business Collaboration Infrastructures.



**Figure 2: The House of Value Creation**

Because of our understanding of Business Model and because of the fact that the ultimate goal of a company is value creation, the design of a Business Model has to be definitely based upon the entrepreneurial strategy. Therefore, if not already done, the first step within a business modeling process is to define the rough

entrepreneurial strategy, on which the Business Model will be based.

The meta-method of the House of Value Creation illustrates the correlation between a set of significant leverages (first pillar of the HVC), the Customer-oriented Business Modeling process (second pillar), and the resulting Business Model (third pillar). As previously hinted, our Business Modeling approach encompasses six layers that correspond to six following steps of the method. The first HVC phase is triggered either by the inside or by the outside of the company – through a new idea, invention, innovation or modifications of the economical environment. The six steps of the method are:

- 1) *Definition of the markets and positioning within the competition.* Initial decision about the category of products or services to deal with (as well as the substitutes). Consequent monitoring of strong players (suppliers, customers, and possible competitors). This phase is about the branch profitability and it considers the rivalry among existing and potential competitors. Phase output: *market model*, with a clear identification of the key players, customers and competitors.
- 2) *Definition and design of the outputs.* After defining markets and identifying core customers and competitors, the outputs (physical products or services) have to be shaped in order to maximize the customers' benefit according to QFD-like method. Phase output: *output model*, with a detailed customer-oriented design of the outputs.
- 3) *Pricing.* The identification of prices for the planned outputs should be more the result of a strategic positioning than of a cost-oriented approach [5]. The price calculation should take into consideration the customers' surplus constraint as well as the strength of the competition (existing barriers of entry, such as patents, industry property rights, etc.). Phase output: *revenue model*, with a detailed description of how earnings will be achieved.
- 4) *Cost-oriented production design.* According to the guidelines of the revenue model, the target costs for the output model will be calculated (as the upper bound for direct costs). Hence, the requirements to the value chain will be detailed. Phase output: *production design*, with a detailed description of how the performances have to be achieved.
- 5) *Partners and network.* In this phase, starting from the requirements on performances of the value chain, the capabilities (core competencies, capacities, available modules and components) of the own performance structure and of the potential partners will be scanned. Phase output: *network model*, selection of the partners within a specific instantiation of the value chain and network configuration.
- 6) *Financing and risk analysis.* Eventually, based upon the expected profits, the risk-level as well as the need for working capital must be calculated to start the search for investors. Phase output: *financing model*.

At each step of the HVC the corresponding targets must be fulfilled. If one step is not fulfilled, then the process should go back to a prior phase as long as the issue is tackled – iterative approach.

## CASE STUDY IN THE MANUFACTURING INDUSTRY

The modeling of inter-organizational EBusiness Models represents a significant challenge, because of the fact that a wide variety of both organizational and technical aspects has to be accurately taken into consideration. Because of the fact that each industrial sector has its own peculiarities, it is necessary to develop approaches and solutions that take into account such specific requirements. Hence, in order to develop successful entrepreneurial *E-Business collaborative solutions*, a dedicated and suitable (E-) Business Model has to be developed.

Our institution has a proved experience with SMEs of the manufacturing and machinery industry – which is a leading industrial branch in Germany. Since we identified a remarkable need for “e-action” in this traditional and static industrial branch, we hence decided to develop customized Business Models and E-Business solutions with a high impact onto this industrial sector.

Nowadays, the generation and mailing of so-called *paper-based test reports* for metallic material, which documents and guarantees to the buyer specific material properties, is accompanied by several serious problems. For instance, the open issues concern the archiving of reports, the specification check of corresponding material standards or norms referenced in a test report [2].

The innovative *trigger* for this case study is the world wide dissemination and acceptance of the Internet as communication and information exchange channel. This makes the development of an Internet-platform for the efficient exchange and storage of material test reports feasible. Based upon the innovative idea of exchanging *electronic material reports* on a collaborative Internet-platform, we propose the following rough Business Model – the result of the use of our House of Value Creation. The different components of the Business Model are:

- 1) *Market Model*. Competition analysis: there are similar solutions (document management systems) that do not fulfill all relevant requirements. Hence, there are no direct competitors. The customers are enterprises which exchange metallic products with specified and guaranteed properties.
- 2) *Output Model*. The most relevant customers’ needs are: operating efficiency and flexibility in terms of exchanging metallic material test reports, as well as security (e.g. transmission and privacy) and system availability. Thus, the output service had been designed to fulfill all the requirements: electronic transaction of standardized reports with high security level and a set of additional services.
- 3) *Revenue Model*. We conducted an analysis of the customers’ benefit. With the use of the electronic transaction platform, the process cost for a test report transmission and specification check drops drastically. Hence, the benefit is remarkable (nowadays, the cost is about 50 US \$ for a single report). Thus, it is clear that the price of a transaction may not exceed 50 US \$. Therefore, we propose a much lower price per transaction, in order both to attract enough traffic and to ensure a wide dissemination of the standard. This heightens the barriers for market entry for possible competitors. The monthly fee for the participation to

the Internet-based Business Collaboration platform should be in this case lower than 100 US \$.

- 4) *Production Design*. Since direct costs (i.e. for the report transmission) tend to zero, the attention should be paid to the fixed cost (i.e. to the target cost for creating and maintaining the infrastructure). A production design with a targeted low fix cost implies that critical mass in terms of participants and transactions can be easily reached.
- 5) *Network Model*. A third party operator should focus on platform-related core activities, while another partner will deal with services related e.g. to trust and therewith security.
- 6) *Financing Model*. Investors must be willing to bear both losses during the initial phase and the risk related to the critical mass. There is a high probability for a scenario with long-term value creation [3].

Some of the most interesting technical and organizational aspects which were taken into consideration within the project are the branch-specific development of a *shared standard* for electronic test reports (which can ensure a fast exchange of required information through inter-organizational networks as well as the integration of different ERP systems within an Internet-based Business Collaboration Platform), the identification of the most appropriate technology to deploy a *back-end integration* in each of the involved enterprises, and the definition of *process standards* for inter-organizational processes and work-flows.

## REFERENCES

- [1] Afuah, A. & Tucci, Ch. L. *Internet Business Models and Strategies: Text and Cases*, McGraw-Hill/Irwin, 2001.
- [2] DIN (publisher) 10 204 *Metallic products – Types of inspection documents; German version*, Beuth Verlag, 1990.
- [3] Fink, A., Schlake, O. & Siebe, A. „Wie Sie mit Szenarien die Zukunft vorausdenken“, *Harvard Business Manager 2000*, (2), 34-47.
- [4] Hagel III, J. & Singer, M. „Unbundling the Corporation“, *Harvard Business Review*, 1999,77(2), 133-141.
- [5] Kim, C. & Mauborgne, R. “Knowing a Winning Business Idea When You See One”, *Harvard Business Review*, 2000,78(5), 129-138.
- [6] Porter, M. E. “Strategy and the Internet”, *Harvard Business Review*, 2001,79(3), 63-68.
- [7] Rayport, J. F. *The Truth about Internet Business Models*, 1999, Retrieved September 27, 2001, from Web site: [www.strategy-Business.com/briefs/99301/page1.html](http://www.strategy-Business.com/briefs/99301/page1.html).
- [8] Rentmeister, J. & Klein, St. „Geschäftsmodelle in der New Economy“, *Das Wirtschaftsstudium*, 2001,30(3), 354-361.
- [9] Timmers, P. *Electronic Commerce – Strategies and Models for Business-to-Business Trading*, John Wiley & Sons, Ltd, 2000.
- [10] Wirtz, B. W. & Kleinecken, A. „Geschäftsmodelltypologien im Internet“, *Das Wirtschaftsstudium*, 2000,29(11), 628-635.
- [11] Wirtz, B.W. „*Electronic Business*“, Dr. Th. Gabler Verlag, 2000.