# TRANSFORMATION TOWARD A CLOUD BUSINESS MODEL

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## Abstract
Cloud technologies have widely been discussed within telecommunications research and practice. Compared to traditional software product business, the cloud enabled service business can be significantly different in nature. Therefore the transformation resulting in the implementation of cloud technologies can be drastic. There are gaps in current literature in the business implications of cloud technologies as well as cloud driven business model transformation. Drawing on business model, change and cloud literature, as well as on a single case study, this paper investigates the cloud business model transformation of an incumbent company. The results of the research indicate that Cloud as a business environment places specific demands for incumbents. This results in step-by-step planning and implementation of business model changes. In addition, customer value related phenomena value co-creation, co-capture and co-opetition appear as key elements in planning and implementing business model transformation toward the Cloud.

## Keywords
Business model, cloud business, transformation, ecosystem.

## 1. Introduction

Cloud technologies are enabling new ways to create value for customers. Key characteristics of cloud offering compared to traditional products include on-demand availability, ubiquitous access, dynamic and immediate scalability, resource pooling and pay-per-use pricing possibilities [10].

Cloud supports the creation of a new logic for doing business. This business logic can be understood by adopting the business model concept as a unit of analysis. Business model can be defined as "*..a representation of a firm's core logic and strategic choices for creating and capturing value*" [24]. The business model is dynamic concept meaning that change in one element of the business model, e.g., due to the Cloud, results in changes also in the other elements. Thus, especially for the incumbent companies, utilizing Cloud in their offering means that the business model needs to be changed.

This notion leads one to consider more closely *what does the transformation toward cloud business model mean and require from companies*? So far no systematic effort has been made in academic literature to answer this question. Starting from this, this paper examines the above question through an action research driven case study describing business model transformation of two incumbent companies towards their new, joint cloud driven business concept. The purpose of this paper is to describe and understand the cloud transformation by using the business model as the unit of analysis.

## 2. Literature on cloud, business models and change

Cloud computing can be defined as "*.. an information technology service model where computing services are delivered on-demand to customers over a network in a self-service fashion, independent of device and location*" [19]. In practice this means that the service providers are responsible for software related installation, upgrade, maintenance, backups, failover functions and security of the cloud service [19]. Cloud, as all internet related technologies, offers new means for maintaining and developing relationships with clients, channels, and suppliers [8][17]. This is driven by two converging trends of IT: IT efficiency and business agility [19]. The following table summarizes the key characteristics and benefits of the cloud based offering [19] [10] [26].

**Table 1.** Cloud characteristics and benefits.

| Cloud characteristics | Benefit |
| --- | --- |
| Ubiquitous access | Independence of location, device and network, new types of services |
| Dynamic scalability | Efficiency |
| Resource pooling | Optimization and centralized management of resources |
| Rapid, on-demand availability | Automated IT, business agility |
| Pay-per-use -pricing | Cost savings, decrease of capital expenses > lower cost of entry for smaller firms |

Parallel to these benefits, cloud introduces also number of concerns related to privacy, security, data integrity, intellectual property management, audit trails, compatibility and reliability for the companies [29]. These concerns need to be considered when planning a cloud based offering. The above-mentioned cloud characteristics, benefits and concerns form the initial requirements, and targets for the new cloud business model. Important notion is, that firms do not succeed by relying merely for example on superior technology, but through the ability to realize and maximize the value potential of the technology with an appropriate business model [27][7].

Business models have been referred to as an "architecture" (e.g. [27][28]), a "recipe" (e.g. [1][23]) or a "design" [25] representing the firm's core logic. It has usually been

attached to the fundamental challenges of how the firm is gaining competitive advantage and profits by *creating* and *capturing value* (see for example [25][34]). Practically, the business model can be understood by breaking it into elements. Following the division made in [21], the key elements are Value proposition, Customer segments, Channels, Customer relationships, Key activities, Key resources, Key partners, Cost structure and Revenue streams. The basic idea is that the business model is created by organizing these elements.

So far perhaps the greatest weakness of the existing business model conceptualizations has been their weak connection to the external business environment. Figure 1 illustrates our new extended business model conceptualization, which draws on value and network approaches (see for example [11][15]). It is argued that companies are connected with each other within the value network or ecosystem through their business models, and these connections are determined by the interconnected processes of value co-creation, co-capture and co-opetition.
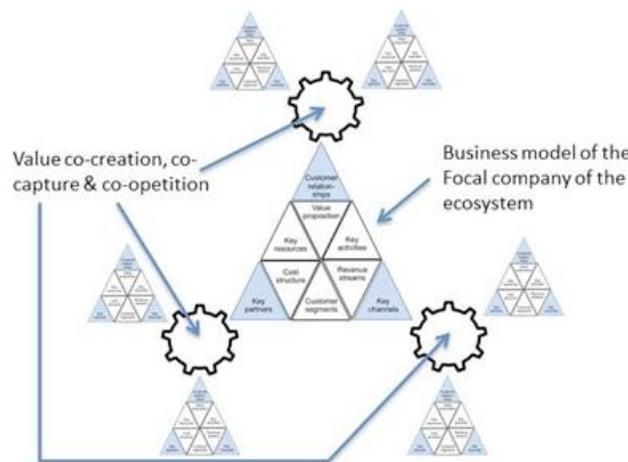


**Figure 1.** Business model based ecosystem.

Value co-creation means the creation of a "bigger pie" among several companies so that there is more to be distributed between the companies [33]. Also, an equally important aspect of value is the ability to capture value, i.e., gain profits [32], which in network context can be called value co-creation. The term Co-opetition illustrates the increased complexity of the current business environment where competition and co-operation could no longer be treated as separate. It is based on the notion of duality, as value co-creation could be seen as cooperative and value co-capture as competitive process. Co-opetition (see [5][13]) can be defined as the coexistence of competition and cooperation within the value creating business network consisting of various actors.

In previous literature business model creation has been regarded as an innovative, complex and dynamic process characterized by uncertainty, experimenting and learning [7][20][27]. In such turbulent environments, the importance of adaptable or agile business model has been highlighted [14][22]. Because the business model change is so difficult for incumbent organizations, the models are usually changed in incremental and

modular ways [16]. For established businesses, the change of an existing business model brings about special challenges for the business model creation. There are conflicts and trade-offs between two different ways of doing business [18]. Examples of these include relationship conflicts and the need to cannibalize existing businesses as a part of the change process [27]. Changing the business model means changing the organization [16], and the activities related to the new business model can be incompatible with current activities [18].

## 3. Data analysis and methods

The research methodology applied in this paper is future-oriented, exploratory, and qualitative action research method [6] utilizing for example the scenario technique [30] [4] and business modelling technique [3][21] in data collection. The research is based on a case study of two companies developing a new joint business concept. The selected case for the research enables a deep examination of the cloud business model transformation in a real life setting. Action research methodology is suitable for seeking in-depth understanding of the mechanisms of change [12][2]. It has also been argued that action research is a valuable method in research dealing with dynamic and turbulent environments [4] and that the method enables researchers to get close to business reality and fosters the development of deep understanding of complexities [6]. The applied research methodology can also be regarded as processual as it concerns time-dependent and path-dependent dynamism of complex systems of organizational processes [31].

In practice the research followed the action research process consisting of a spiral of planning, acting, observing and reflecting [6]. The first phase of the research was to define the core problem and to *plan* what to do about it. In the case study, this phase consisted of the identification of the cloud business model transformation related challenges within the case company and by the creation of a suitable workshop process. The second action research step contained putting the plan into action. In the case study this phase consisted of several business model transformation workshops organized during 2011 and the beginning of 2012. Each workshop was recorded for research purposes and the materials developed during the workshops provided base data for the analysis. The third step was to *collect data* and *observe* the *results* in order to form a full, integrated picture of the situation. In the case, this involved gathering and analyzing the data on workshops: recordings of the workshop sessions and the workshop documents where the results were presented. The last phase of the process was *reflecting* and *learning* from the action. This paper is an essential part of the learning process, presenting the theoretical approach and conceptualizations developed and shared by the researchers, describing the methodological choices of the research, and incorporating the data and the findings of the research into a conclusive discussion on the topic of the paper.

# 4. The case study

Two listed high technology firms, SP's and VH's (European and North American, respectively, located in Finland), specializing in testing next generation wireless networks, have combined their efforts to build a joint "test hotel concept" for providing services for their clientele over the web. Both SP and VH are among the top companies worldwide in their respective business areas and have a long history and good reputation in the global wireless test and measurement business. The test hotel concept is an addition to their mainly software license based test tool businesses, developed and targeted for their existing and potential new customers. For the existing customers the target of the test hotel is to open up new business by improving service levels, speeding up the testing processes, and thus decreasing the total testing costs related to customers' testing needs. In addition, the test hotel may help to deepen the customer relationships with the existing customers and thereby help the companies to maintain their positions as key testing partners for these customers. For the new customers the target of the test hotel is to enable sales in cases where the customers' previously too short-term needs could be served in a feasible manner or where the customers could not acquire test tools due to their high costs compared to the perceived value.

The planned test hotel concept, consisting of virtualized online servers hosting the required software of both SP an HV and being connected to the necessary hardware, enables the companies to provide next generation wireless testing as a service business as an addition to the traditional software licence based test tool business. The test hotel has two main challenges: 1) how to design a completely new, viable business model that makes it really possible to utilize the opportunities of the Cloud in international context and 2) how to transform the existing solutions to the Cloud.

The practical implementation of the test hotel appears as a two-fold process (technical and business model) with several steps. The first planning step included from the user perspective the development of the potential customer use cases for in-house users from subsidiaries and other in-house development, support, or customer services sites as well as from the sales offices worldwide. These use cases serve as a starting point for building a business model for the test hotel as well as for the planning and testing of technical implementation of the test hotel. The second planning step included discussing with the existing customers concerning the usability, value proposition, and possible pricing scheme of the test hotel. The technical implementation of the test hotel has been kept incremental and as low-cost as possible. The implementation steps of the test hotel are outlined with " > " in Table 2.

It appeared evident that the key challenges of the test hotel lie in its business model. Other challenges were related to the usability, reliability and security of the test hotel. From technical perspective the step of adopting testing services from web instead of utilizing traditional software-license based testing tools appeared rather small for the customers – but not for the service provider, as the business processes required for the service provision to be built jointly – therefore requiring fundamental changes to Key Activities, Key resources and Cost structure elements of the business model. Also, the

technical platform was to be built and tested stepwise before any services could be delivered to customers. From the customers' perspective one of the challenges was the pricing scheme, as it seemed difficult to negotiate with the customer about feasible pricing levels of the services compared to the price of software. Tying service pricing to value proposition is required in all businesses, and in a situation where a comparison price exists in the form of license prices, there are feasibility risks especially in the starting phases of the web service model.

The gradual development of the test hotel business model through the above-mentioned transformation steps had a very valid and important reason: to ensure that the test hotel really enables the customers to create value for themselves. In this particular case a helpful comparison could be made during the business model development with the existing business models, which already had proven their value. In other words, the new test hotel business model should enhance or complement the value creation and capture processes compared to the traditional way of doing business.

The change compared to traditional ways of doing business was easiest to understand by looking at the three value-network aspects of the business model: value co-creation, co-capture and co-opetition. These three aspects seemed to define how the test hotel business model eventually became to be. As the test hotel was a joint concept of the two key actors, SP and VH, the value creation became naturally a process of co-creation. For customers the test hotel meant changed processes for purchasing and using the testing solutions. In other words, the process through which the customers created value changed even though the fundamental customer needs related to testing remained the same. Also, the basis for the value capture changed, as the above-mentioned challenges in pricing clearly illustrate.

**Table 2.** The business models within test hotel business case.

| Business model elements | "SP" + | "VH" > | "joint test hotel" implementation steps |
|---|---|---|---|
| Customer segments | Mobile network equipment & Mobile device manufacturers, Mobile network operators | Mobile network equipment manufacturers, Mobile network operators | in-house customers > Existing key customers > New customers |
| Customer relation-ships | Via subcontracting services, own sales and support | Via own sales and support, indirect exportation | Sales push triggered relationships > Customer need (pull) triggered relationships > Value co-creation triggered relationships |
| Channels | Subsidiaries, Joint ventures | Subsidiaries, Value added resellers, Distributors | In-house LAN for in-house customers > Virtualized servers with limited functionality hosted in-house for customer > Virtualized servers inside |

| | | | customers' LAN with full-scale functionality |
| --- | --- | --- | --- |
| Value proposition | "Improving the quality of mobile experience through RD services and testing tools with related services" | "Improving the quality of mobile networks by test tools with related services" | "improving the usability and cost-efficiency of mobile network, application, and device testing" |
| Key resources | Own RD resources, technical competence, own IP (sw/hw products) | Own RD resources, technical competence, own IP (sw products) | Cloud business model, business processes for the cloud services, technical competences |
| Key activities | RD services, RD work of own products, support and sales | RD of own products, own sales and support | Customer service and support, development of services, sales |
| Key partners | Customers, research partners, subcontractors | Customers, subcontractors, research partners | Customers, SP, VH, web connection providers |
| Revenue streams | Customer service contracts & license sales | Own, distributors & VARs license sales | Pay-per-use, service fee |
| Cost structure | RD fixed costs, customer support costs | RD fixed costs, sales & channel costs, support costs | Service maintenance costs, RD costs, customer service costs |

*Source:* Research workshops with and work inside the case companies. *Note:* Business model elements adopted from Osterwalder & Pigneur (2010).

## 5. Discussion and conclusions

In the light of the above discussion, three different kinds of conclusions regarding the Cloud can be made; business model related, transformation related, and ecosystem related. First, the transformation of traditional software licensing businesses toward Cloud enabled services appears as a major change for incumbent companies. The key customer side characteristics of the Cloud, i.e., pay-per-use –pricing, ubiquitous access, and on-demand availability have a strong impact on the business model elements of software license -based businesses. Especially, the business model elements *Customer segments*, *Customer relationships* and *Channels* are affected. In addition, scalability and resource pooling – together with ubiquitous access – change the ways of working (*Key activities* and *Key resources*) inside the organizations. Thus, the whole business model and its elements, including *Cost structures* and *Revenue streams*, too, are affected and thereby necessitate major changes.

Second, regarding transformation, building and implementing major changes in business model takes time, planning, and execution of different activities. There are strong

liabilities coming from existing business. In the test hotel case these liabilities stemmed from the software licensing strategy applied by the two companies and from the hardware requirements of the software products. Seen from the customers' perspective, the accessibility of the services – e.g. in terms of LAN access, affecting scalability, ubiquitous access, and resource pooling potential of the service – forces companies to adopt a strategy of step-by-step implementation of Cloud services. This step-by-step approach was clearest in business model elements *Customer segmentation* (from internal to external customers), *Customer relationships* (from push to pull and value related relationships) and *Channels* (from LAN to virtualized servers). In the case study it was also realized that the companies must first rebuild their Key activities and related Key resources and only then they would be capable of transforming the other parts of their business model.

Finally, regarding the ecosystem perspective, the test hotel ecosystem consists of two co-founders, the test hotel itself, the necessary hardware and Cloud service providers that of course could be the test hotel itself, the connectivity service provider(s), and the customers. From the ecosystem perspective there are two different conceptions of an ecosystem that could be used in the Cloud, first the technological platform based ecosystem and second, the business model based ecosystem. It is important to understand the difference between the two conceptions of the ecosystem. The reason for this is that from the business model (i.e. value co-creation, co-capture and co-opetition) perspective, the ecosystem is directly connected to the money-making machinery of the companies involved in the ecosystem. However, the technical platform related ecosystem conception focuses more on the functionality of the ecosystem, but does not as such pay attention to business related questions. Especially the business model issues regarding Customer segments, Customer relationships, Value proposition or Revenue streams are neglected topics in platform related ecosystem discussions. Therefore, in the studied case, the business model driven conception of the ecosystem seems to provide more comprehensive view of the ecosystem dynamics compared to the technical conception. As the *business ecosystem* and *technical ecosystem* conceptions lead to different perceptions of a same case, we encourage conceptual clarity when discussing ecosystems in the future.

The key limitations of the research are related to the uncompleted cloud business model transformation process of the examined case. This research provides insights from the planning phase and initial steps of the transformation. Since the whole transformation process takes a long time, it requires a longitudinal case study spanning several years to form a comprehensive understanding of the cloud business model transformation. This research provides one of the first results of cloud transformation from the business perspective and the phenomena calls for further research. For example the above-mentioned longitudinal case study of a completed cloud business model transformation would be valuable.

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