TRANSFORMATION TOWARDS A CLOUD BUSINESS MODEL

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Abstract

Current literature on cloud computing lacks coherent discussion and understanding of the business implications of cloud-based technologies. Drawing on literature on business models and cloud computing (usually referred to here simply as "the cloud"), this paper investigates the transformation of business models to incorporate cloud technology. Using the business model concept as a unit of analysis makes it possible to unfold the logic of doing and transforming a business and offers a novel perspective on understanding cloud-based business. The results of the research indicate that the cloud as a business environment places specific demands on companies and that the transformation towards the cloud affects all elements of the business model. The contextual and content related characteristics of the business model result in step-by-step planning and implementation of business model changes. Additionally, liabilities arising from the earlier business model necessitate a gradual approach to the transformation.

Keywords
Business model, cloud business, transformation.

1. Introduction

Cloud technologies are providing new ways to create value for customers. The key characteristics of the 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]. The 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. A business model can be defined as "*..a representation of a firm's core logic and strategic choices for creating and capturing value*" [25]. The business model is a dynamic concept meaning that change in one element of the business

model, e.g., due to the cloud, also produces changes in the other elements. Thus, especially for incumbent companies, utilizing the cloud in their offering means that their business model must be changed.

This notion leads one to consider more closely *what does the transformation toward a cloud business model mean for companies*? So far no systematic effort has been made in academic literature to answer this question. 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 the 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]. The cloud, as with all Internet related technologies, offers new means of maintaining and developing relationships with clients, channels, and suppliers [8][17]. This is driven by two converging trends in IT: IT efficiency and business agility [19]. The following table summarizes the key characteristics and benefits of the cloud-based offering [19] [10] [27].

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, decreased capital expenses > lower cost of entry for smaller firms

In parallel with these benefits, the cloud also brings a number of concerns related to privacy, security, data integrity, intellectual property management, audit trails, compatibility and reliability for companies [30]. These concerns must 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. An important notion is that firms do not succeed by relying on merely one feature, superior technology for example, but through the ability to realize and maximize the value potential of the technology with an appropriate business model [28][7]. However, there is a major gap in literature on the transformation of the business model when implementing cloud-based business. Only a few papers on cloud business models in general can be found [see for example 23].

Business models have been referred to as an "architecture" (e.g. [28][29]), a "recipe" (e.g. [1][24]) or a "design" [26] representing the firm's core logic. They have usually been attached to the fundamental challenges of how the firm gains competitive advantage and profits by *creating* and *capturing value* (see for example [26][35]). In practice, the business model can be understood by breaking it into elements. Following the division made in [21], the key elements are the 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.

One of the most notable weakness of the existing conceptualizations of business models has been their missing a 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.

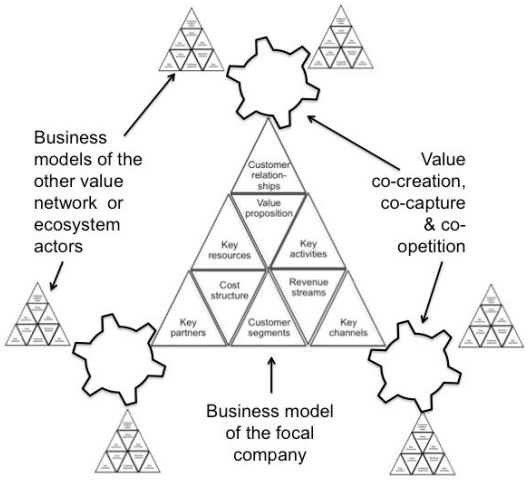

Figure 1. Business model based ecosystem or value network.

Value creation can be viewed as a boundary-spanning [35] process where value is *co-created* among *various actors within a network* as a joint effort, and together with the customers [33]. In addition to value co-creation, an equally important aspect of value is the ability to capture value, i.e., obtain profits [34], which in the networked context can be called value co-capture. The term co-opetition illustrates the increased complexity of the current business environment, where companies simultaneously compete and cooperate with each other. It is based on the notion of duality, as value co-creation could be seen as a cooperative and value co-capture as a competitive process. Coopetition (see [5][13]) can be defined as the coexistence of competition and cooperation within the value creating business network or ecosystem.

In previous literature, business model creation has been regarded as an innovative, complex and dynamic process characterized by uncertainty, experimenting and learning [7][20][28]. In such turbulent environments, the importance of an adaptable or agile business model has been highlighted [14][22]. Because the business model change process is so difficult for incumbent organizations, models are usually changed in incremental and modular fashion [16]. For established businesses, the change of an existing business model raises specific challenges for the creation of a business model. 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 [28]. 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 a future-oriented, exploratory, and qualitative action research method [6] utilizing the scenario technique [31] [4] and business modelling technique [3][21] among others in its data collection. The research studies two companies developing a new joint business concept. The action research driven setting enables a deep examination of a transformation towards a cloud business model 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 a deep understanding of complexities [6]. The applied research methodology can also be regarded as processual as it concerns the time-dependent and path-dependent dynamism of complex systems of organizational processes [32].

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 study, this phase consisted of the identification of the challenges related to cloud business model transformation within the examined companies and the creation of a suitable workshop process. The second action research step entailed putting the plan into action. The study in this phase consisted of several business model transformation workshops organized in 2011 and early 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. This phase involved gathering and analyzing the data from the 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, referred to here as SP and VH (European and North American respectively and located in Finland), specializing in testing next generation wireless networks, have combined their resources 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' needs that were previously thought too short-term could feasibly be met 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 software required by both SP and VH 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 brings two main challenges: 1) how to design a completely new, viable business model that really makes it possible to utilize the opportunities of the cloud in an international context and 2) how to transform the existing solutions to suit a cloud-based business.

Due to the complexity of the test hotel cloud concept, its practical implementation necessitates as a two-sided process (technical and business model) with several steps. The first planning step from the user perspective included 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 the usability, value proposition, and possible pricing scheme of the test hotel with the existing customers. The technical implementation of the test hotel has been kept incremental and as low cost as possible. In those business model elements, where the change from existing business models was significant, the implementation was divided into steps. Those steps are outlined in the " > " in the "New joint test hotel" column in Table 2.

It appeared evident that the key challenges facing the test hotel originate in its business model. Other challenges were related to its usability, reliability and security. From a technical perspective, taking the step of adopting testing services from the Web instead of utilizing traditional software-license based testing tools appeared to be a rather small one

for the customers. However, for the service provider the business processes required the service provision to be built jointly therefore requiring fundamental changes to key activities, key resources and cost structure elements of the business model. In addition, 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 the 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.

There was a valid and important reason for the gradual development of the test hotel business model through the transformation steps mentioned above. That was to ensure that the test hotel really increased customer value through co-creation. In this particular case it was helpful to compare the new business model with existing business models that had already proved their value during its development. In other words, the goal was that 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 came to be. As the test hotel was jointly conceptualized by the two key actors, SP and VH, the value creation naturally became 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. In addition, the basis for the value capture changed, as the above-mentioned challenges in pricing clearly illustrate.

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

Business model elements	**"SP" existing business model**	**"VH" existing business model**	**New "joint test hotel" business model** with implementation steps as >
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, previously not served customer segments
Customer relation-ships	Sales push triggered relationships via subcontracting services, own sales and support	Sales push triggered relationships via own sales and support, indirect exportation	Sales push triggered relationships > Customer need (pull) triggered relationships > Value co-creation triggered service relationships
Channels	Subsidiaries, Joint ventures, no cloud enabled channels	Subsidiaries, Value added resellers, Distributors, no cloud enabled channels	Cloud as delivery channel parallel to own sales organizations: 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 propositi-on	"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 R&D resources, technical competence, own IP (sw/hw products)	Own R&D resources, technical competence, own IP (sw products)	Cloud business model, business processes for the cloud services, technical competences
Key activities	R&D services, R&D work of own products, support and sales	R&D 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	R&D fixed costs, customer support costs	R&D fixed costs, sales & channel costs, support costs	Service maintenance costs, R&D 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

The transformation of traditional software licensing businesses into cloud-enabled service providers appears a major change for the 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 logic and elements of businesses based on software licensing through value co-creation. In particular, 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* are affected and that necessitates major changes.

Building and implementing major changes into a business model takes time, planning, and execution of different activities. There are liabilities arising from the existing business. In the test hotel case, those 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 the companies to adopt a step-by-step implementation strategy for cloud services. This step-by-step approach was clearest in the business model elements of *customer segmentation* (from internal to external customers), *customer relationships* (from push to pull and value related relationships) and *channels* (from LAN to virtualized servers). The case study also clarified that the companies must first rebuild their key activities and related key resources and only then would they be capable of transforming the other parts of their business model.

The key limitations of the research are related to the incomplete cloud business model transformation process in the case. This research does, however, provide insights drawn from the planning phase and initial steps of the transformation. Since the whole transformation process takes a long time, it would require a longitudinal case study spanning several years to form a comprehensive understanding of the cloud business model transformation. This research provides some of the first results on 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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