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Radical innovation of a business model: Is business modelling a key to understand the essence of doing business?

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Is business modelling a key to understand the essence of doing business?

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Abstract

Purpose – This paper aims to investigate key antecedents to the use of radical innovation of the business model of a service firm to achieve competitive advantage. "Business model" emerged fairly recently as an academic concept, competing with "sustainable strategic competitiveness", "strategic fit" (Porter, 1996) and "dominant logic" (Prahalad and Bettis, 1986) to give key explanatory understanding of firm performance.

Design/methodology/approach – The article is based on action research, in which the re-engineering of a service business turned into radical innovation of the business model.

Findings – Radical innovation (conceived of as a new dominant logic) of the business model of a service firm is shown to give sustainable competitive advantage. It shows how fundamental the concept of business model is to understanding the nature of the business and links it to fundamental academic discussion of recent decades around concepts such as "sustainable competitive advantage", "structural capital" and "tacit knowing".

Research limitations/implications – This is based on a case, and more research is needed to generalize the findings.

Practical implications – In contrast to the knowledge management and structural capital evangelization, much tacit knowing cannot be converted to structural capital.

Originality/value – Business model is a central concept to understand business performance, but must not be conceived as all-encompassing. We give a model for what the concept should cover and contrast it with other important models.We show the role of tacit knowledge in a business model.

Keywords Business model, Tacit knowing, Competitive advantage, Structural capital, Fit

Paper type Research paper

Literature Review

Business model

The concept of business modelling is relatively new and has been discussed in academia roughly over the past 20 years (Bettis and Prahalad, 1995; Sawhney, 1999; Amit and Zott, 2001; Stähler, 2002; Chesbrough and Rosenbloom, 2002; Magretta, 2002; Hedman

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and Kalling, 2003; Mitchell and Coles, 2003; Osterwalder, 2004; Morris *et al.*, 2005; Zott and Amit, 2007, 2008a, 2008b, 2010; Chesbrough and Schwartz, 2007; Chesbrough, 2007, 2010; Johnson *et al.*, 2008; Andriopoulos and Lewis, 2009; Doz and Kosonen, 2010; Mets, 2009; Osterwalder and Pigneur, 2010; Teece, 2010; Yunus *et al.* 2010; Zott *et al.*, 2011; Baden-Fuller and Haefliger, 2013). Yet, in many ways, it has similarities with the earlier concepts of dominant logic (Prahalad and Bettis, 1986; Bettis and Prahalad, 1995) and strategic fit (Porter, 1996). Business models are considered as part of the strategy subfield, and the most important journals, in which the concept is discussed, are the *Strategic Management Journal* and *Long Range Planning*.

Research about business models is young, and relatively few "[…] concepts and tools exist to help managers capture, understand, communicate, design, analyze and change the business logic of their firm" (Osterwalder, 2004, p. 22). Stähler (2002) crafted one of the earliest summaries of the essential elements of a business model.

Recently, Teece (2010) gave the definition that is currently most widely accepted in the literature:

> The essence of a business model is in defining the manner by which the enterprise delivers value to customers, entices customers to pay for value and converts those payments to profit […]. In essence, a business model embodies nothing less than the organizational and financial "architecture" of a business (p. 172, p. 173).

Teece presented the following table as a summary of the most important elements of a business model (Table I).

Osterwalder and Pigneur (2010, pp. 14-46) propose a "business model canvas" consisting of customer segments, value propositions, channels, customer relationships, revenue streams, key resources, key activities, key partnerships and cost structure. The difficulty with such a proposal is that it encompasses most of what business is; it does not give specificity for the concept business model.

Baden-Fuller and Haefliger (2013, p. 419) have provided a different interpretation:

> We define the business model as a system that solves the problem of identifying who is (or are) the customer(s), engaging with their needs, delivering satisfaction, and monetizing the value […].

Or alternatively, a "[…] business model should be able to link two dimensions of firm activity value creation and value capture […]". (Baden-Fuller and Haefliger (2013, p. 419). Expressed in this way, the "business model" is the essence of classical economy (Smith, 1776, p. 131; Ricardo, 1817, p. 55; Marx, 1933, p. 15), exchanging "use value" for "exchange value": "[…] the source of new use values is the labour performed by organizational members, and that firm profits can be attributed to this labour." (Bowman and Ambrosini, 2000). This is consistent with the resourced-based view, as

BM component	Questions to ask
Value proposition	What value does the company create for customers and partners?
Product/services	What does the firm sell?
Architecture	How and through what configuration is value created?
Revenue model	How does the company earn money?

Source: Teece (2010, p. 173)

Table I.
Business model

perceived by its creator, Penrose (1959) (Philipson and Oghazi, 2013). Hence, according to Bowman and Ambrosini (2000), […] value has two main components:

(1) Perceived use value, i.e. value is subjective. It is defined by customers, based on their perceptions of the usefulness of the product on offer. Total monetary value is the amount the customer is prepared to pay for the product.

(2) Exchange value is realized when the product is sold. It is the amount paid by the buyer to the producer for the perceived use value.

Business model is a system that solves the problem of identifying who is (or are) the customer(s), engaging with their needs, delivering satisfaction and monetizing the value (Baden-Fuller and Haefliger, 2013, p. 419).

In a start-up of a new firm, a business model is a tentative conception on how the company intends to deliver what value and to whom. An established business is always tweaking its business model to become more competitive, but when there is a need to radically change the business model, we can talk about business model innovation. We intend to show the consequences of such an innovation.

Business models vs business strategy

> […] A business model is more generic than a business strategy. Coupling strategy analysis with business model analysis is necessary to protect whatever competitive advantage results from the design and implementation of new business models (Teece, 2010, p. 180).

Strategy is conceived as being thought out in advance, or planned. This *ex ante* assumption is valid in some cases, where the business model is a set-up that has been conceived in advance. For instance, Southwest Airlines may actually have been built based on a pre-conceived strategy (Porter, 1996). However, the more common situation involves strategy evolving as a result of a learning process, either by conscious experimenting (known in literature as "agility"), or as a result of learning from unplanned reactive responses to competition or customer responses. This situation seems to be the case for IKEA, where what has been perceived in retrospect as a planned process, was actually more the result of adaptation to customer response (Porter, 1996; Mintzberg and Waters, 1985).

The fundamental strategy question is this: how does one build a sustainable competitive advantage and get abnormal earnings? It is not enough to develop a successful business model to assure competitive advantage, as imitation is so easy (Teece, 2010, p. 173). Porter (1996, p. 62) wrote that a company could outperform rivals only if it could establish a difference that it could preserve. Such a difference can be sustained if the firm can make many choices embedded in organizational praxis, which necessitate competitors to imitate not only discrete advantages, but also the system as a whole. Hence, the competitive advantage grows out of the entire system of activities. Rivals will get little benefit from imitation, unless they successfully match the whole system (Porter, 1996, pp. 73-74).

Chesbrough and Rosenbloom (2002, p. 535) argue that strategy and business development are different, and that strategy is superimposed on business models:

- The business model starts by creating value for the customer and constructs the model around delivering that value. There is some attention to capture in a portion

of the value created, but the emphasis upon value capture and sustainability is much stronger in the realm of strategy.

- A second difference lies in the creation of value for the business versus creation of value for the shareholder.
- A final difference is in the assumptions made about the state of knowledge held by the firm, its customers and third parties. The business model construct consciously assumes that this knowledge is cognitively limited, unbiased by the earlier success of the firm. Strategy generally requires careful, analytic calculation and choice, which assumes that there is a great deal of reliable information available. It similarly assumes that any cognitive limitations on the part of the firm are of limited importance (Figure 1).

We disagree with Chesbrough and Rosenbloom (2002); in our view, the business model, how the firm intends to create value for a set of customers, is a prerequisite for profits, which thus are conditional of the value-creation – unless profits are a result of a rip-off (see Figure 2).

Customer needs

"The chances of good design are greater if entrepreneurs and managers have a deep understanding of user needs […]" (Teece, 2010, p. 190). The formulation of the principles

Figure 1.
Economy and energy, own

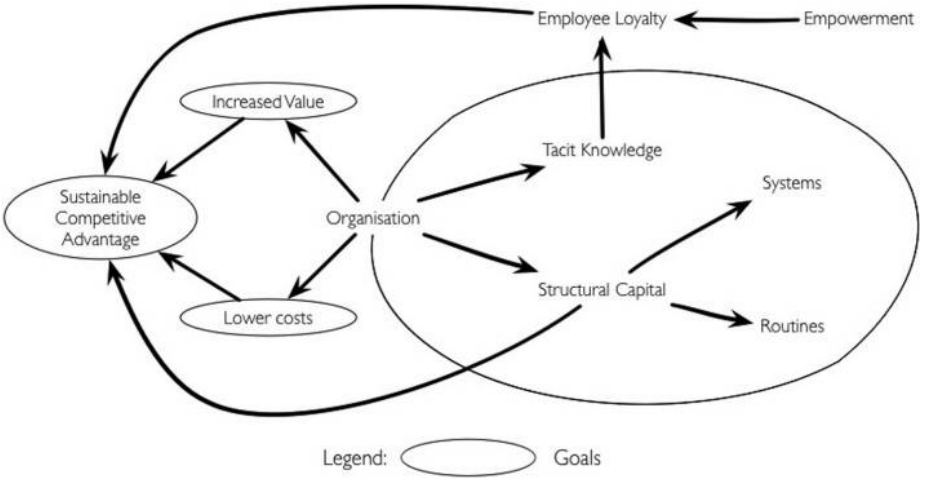

Figure 2.
Activity system in the case, own

of the organizational change must be based on intimate knowledge of the customers' needs. "The starting point of the process was a detailed and in-depth understanding of the consumer […]" (Prahalad, 2012, p. 7). Innovations are often "[…] based on intuitive hunches rather than informed understanding […]" (Margolin, 1997, p. 227; Prahalad, 2010). "Rather than researching markets, they must immerse themselves in the lives of their target consumers" (Prahalad, 2006, p. 7). The innovators that Prahalad (2012, p. 7) studied used video-ethnography to identify more than just what people say they need. Many researchers have identified this "intimate knowledge" as a key for successful innovation and competitiveness. The strategy researcher Porter (1990) identified "*commitment*" to the target group (our emphasis) as a key antecedent to international competitiveness. This commitment permits the firm to gain intimate knowledge of the customers. The entrepreneurship researcher von Hippel (1994) identified the "*stickiness*" of needs information as a key issue for innovation, i.e. how to understand customers' needs (and the stickiness of solutions knowledge). Instead of ethnography, von Hippel developed a method called the lead-user theory for how to learn these needs before the competitors (von Hippel, 1986; Herstatt and von Hippel, 1992; Urban and von Hippel, 1998; Olson and Bakke, 2001; Liien *et al.*, 2002; Lüthje and Herstatt, 2004; Lettl *et al.*, 2006; Franke *et al.*, 2006). These issues are discussed in many journals in different subfields, but the most important are *Management Science*, *The Journal of Product Innovation Management* and *Design Studies*.

Lack of empirical research

Both theoretically and practically, however, a lack of studies characterizes the subject: The paucity of literature (both theoretical and practical) on the topic is remarkable, given the importance of business design, particularly in the context of innovation. The economics literature has failed even to flag the importance of this phenomenon, in part because of an implicit assumption that markets are perfect, or very nearly so. The strategy and organizations literature has done little better. As with other interdisciplinary topics, business models are frequently mentioned but rarely analyzed (Teece, 2010, p. 192).

One reason may be that the idea of a "business model" draws from and integrates a variety of academic and functional disciplines, gaining prominence in none (Chesbrough and Rosenbloom, 2002, p. 533). When the industry structure changed significantly, even highly intelligent managers found it difficult to think strategically about businesses with different characteristics than their own core business (Bettis and Prahalad, 1995, p. 6).

Hence, presenting and interpreting practical examples in the form of cases of business modelling is eminently valid. We provide such a case based on our own action research.

Method

This is a case study (Yin, 1994) which uses multiple data collection methods (Eisenhardt, 1989). It is an example of action research, using a set of methodological approaches based on Dewey (1933), Lewin (1946) and Argyris (1993), all after Lüscher and Lewis (2008):

> Action research is an iterative process involving researchers and practitioners acting together on a particular cycle of activities, including problem diagnosis, action intervention and reflective learning (Avison *et al.*, 1999).

Action research is not mentioned as one of the case study approaches in Eisenhardt's (1989, p. 535) list of such, and has, according to Avison *et al.* (1999), not been used

frequently in business administration, but a query on Google Scholar found more than 57,000 articles published from 2000, with the cut between "action research" and "business administration".

The researcher was hired as project manager of a major change project in the company, an affiliate of Asea Brown Boveri (ABB). The reference group consisted of the CEO, the strategic business unit manager and the chair of the blue-collar workers' union. The expertise necessary for the project was acquired through a large number of interviews, through the observation of all kind of employees in the SBU and through monthly dialogues in the reference group, during a four-year period. The reference group had an intimate knowledge of the business and the customers through visiting customers. The author, although external to the company, had an intimate knowledge of the company (see attachment), which should be considered for understanding the action research.

The case: ABB truck service

ABB Truck produced big electrical forklift trucks for the European car, food and roll-on/roll-off industry. ABB Truck Service was a business unit of ABB Truck AB, serving and repairing complicated machines at the customers' sites. The business was limited to the Swedish market. As the mother company, ABB Truck AB, only sold to the European market and did not have a large enough market share outside Sweden to motivate a repair and service business, which instead was provided by the partners selling the machines. In the Swedish market, the service business had some 225 service technicians and 75 middle managers and administrators. The high proportion of middle managers and administrators (1/3) *vis-à-vis* workers imposed a huge cost on the business, and was one of the issues that had to be solved.

The purpose

The purpose of the project was formulated as follows:

- Radically improve the value for the industrial customers. This was interpreted as halving the downtime of the machines.
- Radically reduce costs to be competitive in the long run – give value for money.
- Porter (1996) has proposed that to make a competitive advantage sustainable, that advantage must be embedded in the organization so that competitors cannot just imitate a few specific traits of the offering. Rather, they would have to imitate the whole organization, and such an effort would provide a stiff deterrent to any attempt to copy, borrow or co-opt the firm's competitive advantage. To create such sustainable advantage, we had to create new structural capital and assure that the tacit knowing of the workforce did not leave at the end of the working day. As the tacit knowing of the service technicians was the key to competiveness, we wanted to increase their loyalty to the firm by creating a better work environment for them, thus empowering the technicians in their immediate work. Their union was also interested in ensuring the long-term competitiveness of the company, hence securing the jobs. This ensured their co-operation. The blue-collar workers' union enthusiastically supported the project. As we intended to radically reduce the number of white-collar jobs, we did not expect to be able to co-operate with the white-collar union. "Johan S.", the local chair of the blue-collar workers union, "Metal", was heavily involved, both in the envisioning of the new system structure and its realization as a member of the reference group and a key dialogue partner.

At the time, business modelling was not a known concept, and the project was framed as a business process re-engineering (BPR). But BPR is only concerned with how to deliver a "given" value (Hammer, 1990, p. 104; ONeill and Sohal, 1999; Hammer and Champy, 2000), not how to produce a new or radically different value. Hence, in retrospect, we have analysed the case for what is a business model innovation.

The re-modelling process

The process was conducted in seven distinct but overlapping phases:

(1) formulate a new business idea;

(2) innovate a new way of organizing the business;

(3) develop new systems supporting the new organization;

(4) develop new routines for how to use the new system;

(5) educate the work force in the new work methods, systems and routines;

(6) implement the new organization; and

(7) rationalize to achieve the second goal.

A new business model

We started by building a vision for how the division would function seven years after the start of the project. The service workers should become "virtual entrepreneurs", ordering spare parts and reporting work done. Through portable computers, with mobile phones as modems, the technician should access exploded blueprints on a central server for searching solutions to the problems of the faulty machine. Then the technician would order spare parts over the computer. These were to be flown in, arriving at the customer's site the next day. After repair, the technician reported his work through the server. An invoice would be automatically generated and sent to the customer. With a printer under the passenger seat of the service car, the technician would be able to give the customers small quotes. Hence, we created an integrated workflow.

New concept for organizing the business: new workflow

The number of workshops was to be reduced, as the technician would do the lion's share of the real work at the customer's site, and a machine would have to be brought into the workshop only occasionally. We would centralize the spare parts warehouse, to enable overnight delivery from the nation's principle airport, so that there would no longer be any spare parts administrators at local workshops. The new workflow was developed with detailed flow-mapping and was discussed in a reference group that included the CEO of ABB Truck, the union leader, the division manager and the division controller.

These changes meant that the structural capital of the company was increased, through the development of a new structural capital of new, simple and streamlined systems and routines, built on the explicit knowledge of the administrators and the middle managers. At the same time, however, the company also needed to retain the tacit knowing (Polyani, 1966) of the technicians – their "sticky" solutions knowledge (von Hippel, 1994). To secure this tacit knowing, we considered their loyalty as essential. We achieved this goal by empowering the technicians; they were to become their own masters in all elements of the work that were not embedded in the structural capital. Even though there was no market relationship between these "virtual" entrepreneurs

and the firm (they were employed), this can be seen as an example of "[…] a two-sided business model that has two sets of customers typically also involves two value chains – one for each side of the market" (Baden-Fuller and Haefliger, 2013, p. 421).

New systems

An IT systems architecture was then specified that could uphold this vision. We specified a central server, an IBM AS400 machine, which hosted all manuals with construction designs that could be "exploded", down to the smallest level of detail. It also hosted the database of the spare parts warehouse.

A client system architecture for the technicians' computers was designed. To actually make the necessary server and client software, a computer consultancy was engaged. Every step of the coding was verified, and the researcher acted as the interface between business knowledge and information technology. These were installed in a portable computer, and the technicians were given access to the server through a dial-up connection over a mobile phone. They also had a small printer installed under the passenger seat of each of their cars. At the time, the linking of portable computers and mobile phones as modems for accessing a central server was a new technology. We did not invent this technology, but it enabled a radically re-invented business model.

The technical part of the project included:

- functional specification of a new spare parts system;
- functional specification of technicians' order and reporting system; and
- project management of systematization and programming done by outside computer consultants.

New routines

The implementation was not self-evident. Model routines were developed for the workers and leaders to learn what to make out of the system.

Educating the work force

Working alongside the labour union's representatives, we educated the technicians in the use of the systems and the routines.

Implementation

The new spare parts centre was built near Arlanda, outside Stockholm. Personal computers, mobile phones and printers were bought for 225 technicians. In 1992, four years after the project had started all technicians had received the necessary training, education and equipment.

Rationalization

A major efficiency realized was that these systematic changes rendered two-thirds of the 75 administrators redundant. Most of them were given early retirement or lateral transfer within the ABB group. This rationalization of course reduced the future price of services, and hence the value for money offered to clients.

Results

The downtime of customers' machines were reduced from 3 days to 1.5 days per incident. Administrative overhead was reduced from 75 to 25 employees. The change

took four years, from 1988 to 1992. When the whole ABB Truck group was taken over by Cargotec, some years later, they closed the whole company except the new way of operating the service business, giving it a value of $200 million.

The most important outcome of the project was enhanced quality of service:

- The instant access to manuals reduced the time to find the defective detail and, hence, the time the machine was non-operational.
- The technicians had previously ordered the spare part by phone from a local spare parts centre, where an administrator would manually identify if he had the part in stock. If not, he had to order it from the factory. Often this process entailed delays of three to four days. In the new organization, however, the immediate order of spare parts reduced the time to get the part, and, hence, the time the machine was non-operational. The missing part was sent by parcel post the same day from a centralized shipment centre close to Arlanda, the main Swedish airport, arriving at the client's site before noon the next day. Thus, a "just-in-time" (JIT) system was implanted, reducing repair times, machine downtime and cost to both the company and the client.
- The technicians were authorized to give the client minor quotes (up to some 1,000 euros in present value), immediately printing the quote on the on-board printer.
- The technician reported work time and spare parts used over the system, directly generating an invoice in the central server. Apart from being the most important rationalizing element, it meant that the quality of the information of the invoice increased, passing information directly from the primary source to the invoice.

These changes were only carried out in the technological service support system, but all of them radically increased the quality of service, as well as reducing operating costs, and hence the future price of the service.

The overall process can be viewed as a re-modelling process. This design process had consequences for the technological support systems, as well as for the actual service delivery systems; both of which directly influence the quality of service.

Analysis

Theoretical interpretations

This case is an example of organizational innovation in which "[…] new business models can themselves represent a form of innovation" (Teece, 2010, p. 176). To change the "dominant logic" (Bettis and Prahalad, 1995; Levitt, 1960) in an industry, it is necessary to establish radical goals for the project. These goals are an example of what Prahalad (2006) has called the "innovation sandbox", the challenging requirements for the project that are necessary for radical innovation. Here one must "[…] start by identifying the core constraints that they must overcome to achieve a breakthrough innovation" (Prahalad, 2006, p. 3). To halve the downtime represents a quantum improvement and is quite different from incremental innovation based on gradual increase of effectiveness. The requirement to reduce the overhead by more than 50 per cent was also radical. Both requirements were inspired by the at the time current "T50" projects (halve-the-time) running in the ABB group. Of course the change requirements were less radical than the examples Prahalad (2012) has given, of reducing the price for cataract surgery or a cooker for the Indian poor to 1/50th of the extant price. Still, it is

radical improvement, as the theoretical limit of the machine downtime – by flying in spare-parts "à la minute" – would be some six hours; to a prodigious, not sustainable cost. We had to base our change on standardized parcel post.

The value proposition of ABB Truck Service was to reduce downtime for the customers' machines. The architecture was an integrated workflow that in more than 98 per cent of the time gave the customer access to the machine within the promised 36 hours. The price for customers was cost-based. In retrospect, it could be questioned if this pricing model captured value; the best alternatives could have been a fixed price for each type of intervention or even a diminishing price after 36 hours had passed – even if that might involve heavy extra costs for the firm. Still, in the complete process overhaul of the business model carried out, this was one of the few stable parameters in the game!

We created a new business model by delivering superior value at a lower cost. To make this business model sustainable, new structural capital, in the form of new systems and routines, was created. To keep the tacit knowing in the firm, we empowered the critical workers to gain their loyalty for the organization.

In the ABB Truck Service case, the new competitive advantages were based on a large set of new activities: the online access to blow-ups of design drawings, online-order of spare parts, overnight delivery of spare parts, direct operator reporting of work done and immediate central invoicing. To copy the new achieved advantages, a competitor would have to incur the trouble and expense of copying all elements, including training of the work force, and would in addition have to adopt and manage effective routines for handling of the system.

The new "business model" developed fulfils Rosenbloom's criteria (Chesbrough, 2010, p. 355), Osterwalder and Pigneur's (2010) business model canvas and Porter's (1996) strategy fit to a certain degree (Table 2).

Conclusions

The most prominent conclusions are that to deliver a new value proposition to customers at a radically reduced cost, it was necessary to completely reorganize the organization, embedding explicit and some parts of tacit knowing of administrating personnel in systems and routines and even more important to loyalize the workers, on whose tacit knowing the firm depended. This is fundamental critique of knowledge management (Nonaka, 1991, 1994; Nonaka *et al.*, 2000; Nonaka and von Krogh, 2009). It is very likely that a large part of tacit knowing cannot be externalized, and, hence, the quest to liberate the firm from employees by building explicit knowledge is most probably a "cul-de-sac".

The case presented shows business modelling as a key to achieving sustainable competitive advantage. More case studies will improve the scientific understanding of business modelling at the present stage of development. A key element presented here involves the re-engineering of the entire organizational system to prevent competitors from simply copying the apparent competitive advantage.

Reflections

In retrospect, it was risky not conducting a more systematic in-depth study of the needs of the clients.

Other concepts and implications

The case could be viewed from many other perspectives, which have not been discussed here: the performance effects of workers' empowerment (McEwan and Sackett, 1998;

Table II.
Four concepts of business model, own

Our model	Chesbrough (2010)	Osterwalder and Pigneur (2010)	Porter (1996)	Our case
Customers	Market segment (1)	Customer segments (1)	Customer segments	Given
Use value for customers	Value proposition (2)	Value propositions (2)		Radically changed
		Channels (communication with and reaching the customer) (3)		Formal communication changed; direct relationship customer – technician
		Customer relationships (4)		Partly changed
Captured exchange value	Revenue mechanism(s) (4)	Revenue streams (5)		Captured exchange value
Loyalizing tacit knowledge holders		Key resources (6)	Operational effectiveness	Loyalization
Structural capital:				
Systems				New
Routines				New
		Key activities (7)	Activity system	Activity system
	The structure of the value chain (3)	Key partnerships (8)		
	Position of the firm within the value network (6)			
	Cost structure and profit potential (5)	Cost structure (9)		Radically reduced
			Synergetic reinforcement (fit) of key activities	Synergetic reinforcement (fit) of key activities
Competitive advantage	The competitive strategy (7)		Competitive advantage	Competitive advantage

Vidal, 2007; Udo and Ebiefung, 1999; Waldeck and Leffakis, 2007; Waldeck, 2007), strategies for implementing organizational change (Gupta *et al.*, 1997; Khazanchi *et al.*, 2007), service innovation theories and many others. Specialized researchers study each of these issues and often have specific journals more or less dedicated to such studies.

Note about the author's relation to the case

Between 1982 and 1994, I worked as a management consultant for the ABB group. In 1988, Bengt Svensson, CEO of ABB Truck – a subsidiary of ABB – suggested that we should re-engineer the business rationale of the service division of the company. In the case, I was not only a consultant with a specific task to complete, but I had also worked with ABB Truck since 1985 (and with ABB since 1982). In this context, I had been working with organizational change in marketing production services and had made the specification for software to manage the short-term rental fleet. I had further been hired as regional general manager for sales and services for eight months, and negotiated a five-year rental contract (capital and service) with the Volvo Car Corporation for 500 machines.

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