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Shift in business models in pharmaceutical industry

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Abstract: The following paper is devoted to the research about the shift in business models in the pharmaceutical industry. A fast changing business environment caused by a transformation of technology, communications and business itself, has created a new landscape for the pharmaceutical industry. The old business model built around the blockbuster drug development and production is not efficient any more. Pharmaceutical companies are shifting their business models towards defragmentation and risk aversion. The purpose of this paper is to analyze the shift in business models in the pharmaceutical industry through construction and comparison of the old blockbuster and alternative defragmented business models on the basis of the business model concept suggested by Osterwalder (2004).For the purpose of the deeper understanding of the researched issue, several in-depth interviews are held with pharmaceutical companies in Skåne region, Sweden.

Key words: Business model, business model canvas, pharmaceutical industry, blockbuster business model, defragmented business model

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Summary

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Keywords:	Business model, business model canvas, pharmaceutical industry, blockbuster business model, defragmented business model
Purpose:	To clarify the major shifts in business models in pharmaceutical industry due to the changes in the business environment and industry itself
Theoretical framework:	Business model concept by Osterwalder (2004)
Methodology:	Theoretical approach- literature research; in-depth interviews

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1. Introduction

The following chapter presents a general overview of the research question. Background and problem discussion shed light on the main issues highlighted in the further chapters.

1.1 Background

A fast changing business environment caused by a transformation of technology, communications and business itself, has created a new landscape for many industries during the last few decades. In today's business milieu, being innovative doesn't mean being competitive any more (Chesbrough, 2007). Companies invest more and more in the development of new products and technologies, but benefit less and less from that. Besides, products' lifecycle is becoming shorter and shorter which means that innovation itself doesn't guarantee long-term profitability (Chesbrough, 2007). In addition to that, the convergence of technologies resulted into a shift of boundaries between industries. For example, 10 years ago education, entertainment and the communication market were serviced by different actors and products, but nowadays it is embedded into one product (Prahalad and Ramaswamy, 2003). This indicates even greater uncertainty – rules established for different industries are blurring now. Creating product variety has become easier, but competition for value through product variety has become tougher. The above factors make companies rethink the way they do their business.

The most convenient and recent way to illustrate how the company builds its business (that is how the company creates value for itself and the customer) is through the business model. The business model has become more important than innovation today – one technology commercialized in two different ways will give two different outcomes (Chesbrough, 2010). Business models are even subject to patent law, like Amazon.com has a patent for one-click purchase (Rappa, 2002). Due to the novelty of the concept there is no unified definition of the business model, though it has become a part of the vocabulary of every manager (Shafer, Smith and Linder, 2005). For the purpose of this study definition suggested by Chesbrough & Rosenbloom (2002) will be used:

"Business model is a framework that takes technological characteristics and potentials of the company as inputs, and converts them through customers and markets into economic outputs."

Projecting the definition into practice, it is important to understand that a business model implies a system of interdependent elements which make the enterprise function towards a certain strategic direction. The problem with defining units of a business model remains the same: scholars haven't come to the single conclusion about the structure of business models. Most perspectives on business models imply a company's offering and a set of activities necessary to produce and deliver that offering to the market (Morris et al., 2005). The definition of offering implies a specific product or service which a company offers to customers at the market. Structural decomposition of the business model into interrelated units differs among the scholars dependently on the prevailing theoretical framework. Cross-theoretical origins of the business model concept lie in the value chain concept (Porter, 1985), the resource-based theory (Barney et al., 2001), the strategic network theory (Jarillo, 1995), the cooperative strategy (Dyer and Singh, 1998) etc. Therefore, some authors define a business model's elements in a more strategic context (Hamel, 2001; Weil and Vitale, 2001 etc), whereas some scholars make stronger emphasizes on a firm's available capabilities (Betz, 2002; Chesbrough and Rosenbaum, 2000 etc).

With the purpose of determining a company's business model, Osterwalder (2004) proposed to use nine interdependent elements (key partners, key activities, key resources, value proposition, customer relations, channels, customer segments, cost revenue and revenue streams) organized into four pillars (value proposition, customer interface, infrastructure management and financial pillar). The business model was later developed by Osterwalder and Pigneur (2009) into a business model canvas, which is "a strategic management tool, a visual template preformatted with the nine blocks of the business model, which allows to sketch out new or existing business models". The business model canvas has a wide practical implication among practitioners and allows illustrating the basic business model of any enterprise. The business model developed by Osterwalder (2004) and its practical visualization (business model canvas) developed by Osterwalder and Pigneur (2009) will be used in this paper.

Projecting the business model canvas concept (Osterwalder and Pigneur, 2009) on the definition of the business model suggested by Chesbrough and Rosenbloom (2002), a modified definition of business model is synthesized for the purpose of this paper:

"Business model is a framework that takes company's technological characteristics and potentials built on key activities, key resources and key partners as inputs and converts them through target customer segments, customer relations and markets as a distribution channel into economic outputs by means of value proposition (product or service offering) creation and delivery".

Companies should understand their business model to mark out incentives for its development, interdependencies with other actors and weaknesses – so that they know when and how they need to make a shift in their business to remain successful and growing (Johnson et al., 2008). Coming back to the changes which are dominating in the business landscape today, many industries have faced the necessity of rebuilding its current business models with the purpose of staying competitive: oil industry in late 1970's, automotive in mid-1980's, electronics in late 80's, chemicals/specialties in early 1990's and personal care in mid-1990's (Chitra, n.d.). An interesting case is the pharmaceutical industry today - being reshaped with new challenges and proving the main business trends, it faces the need to acquire new rules for the new business arena.

Pharmaceutical industry, according to Britannica Encyclopedia (2009), comprises "public and private organizations involved in the discovery, development, and manufacture of drugs and medications". Traditionally, the business model in the pharmaceutical industry is built around the "blockbuster drugs" targeted at the mass market. Generally accepted definition of the blockbuster drug is based on the revenue size from the drug sales which exceeds $ 1 billion. Moreover, blockbuster drugs comprise about one third of the pharmaceutical market sales revenue (Seget, 2010). IMS report (2011) estimated global pharmaceutical market in 2010 in $850 billion. Moreover, Seget (2010) is forecasting the growth of the global pharmaceutical market to $1,033 billion in 2014.

Nowadays the pharmaceutical industry faces complex challenges which make pharmaceutical companies to rethink the way of doing business. From one side, technological progress, emerging markets and demographical factors open new opportunities for the pharmaceutical industry. From other side, licenses expiry for blockbuster drugs and generics' expansion (generic drug is a drug product that is comparable to brand/reference listed drug), economic limitations and regulation restrictions put pressure on the market (Mercer commentary, 2001).

Following the main business trends, one of the major problems in the pharmaceutical industry is lack of productivity. A future uncertainty has become the main challenge for the pharmaceutical industry and put the existing pharmaceutical business model, which was dominating at the market for a long time, under the risk. The blockbuster business model[1] nowadays gives returns on investments lower than industry's adjusted cost of capital (Gilbert et al., 2003). Pharmaceutical companies have to move from the blockbuster and fully integrated business model to alternative ones. Strategically, the business model shift should be aimed at more efficient cost management, customer/value management and a defragmented business model (Chitra, n.d.). Defragmented business model is a business model focused on the specific part of the production pipeline.

Focused on the pharmaceutical industry, current study covers the main challenges and trends in the pharmaceutical industry in relation to the business model concept and reveals how pharmaceutical companies cope with market shifts and challenges with the help of business modeling.

1.2 Problem discussion

The pharmaceutical industry today is facing so called "productivity paradox" – companies invest more money in research and development, but the number of medicines approved is lessening. The Business model which has been prevailing in the industry – the blockbuster model - implied

[1] For the purpose of this study, blockbuster business model – business model built around the production and distribution of the blockbuster drug

fully integrated architecture of pharmaceutical companies. That means that the whole value chain is locked inside the company. At the final stage only a small number of drugs achieve global sales (in this case sales usually exceeds 1 billion) resulting in large profits (Chitra, n.d.). The major risk the blockbuster model faces is the great uncertainty concerning the success of the drug development at the final stage. The return on investment must be higher than the cost of capital to make the firms able to gain profit. Thus the revenues from the blockbuster sales should cover investment for research and development, drug manufacturing, drug delivery to the market and other costs.

There are several major trends which are shifting the pharmaceutical industry today:

- **Value creation** can't be generated through company-centric, product-and-service prism any more (Prahalad and Ramaswamy, 2003). Since the range of the products at the market became overwhelmed, customers are seeking not only for quality and variety, but for the best solutions. Ability to discover, test, manufacture, and distribute highly valued, complex products doesn't ensure value creation (Mercer commentary, 2001). Nowadays patients are becoming more informed – they are looking not only better medicines, but also a range of satellite services (PriceWaterHouseCooper report, 2009).

- Investors are shifting their market valuations to business units which focus on satisfying critical customer priorities (Mercer commentary, 2001).**Value migration** is moving from the fully integrated pharmaceutical companies to the defragmented companies which specialize on particular parts of the value chain pipeline.

- The shift from a closed business model to an **open business models** can be observed. Since companies are finding it more difficult to justify investments in innovation - development costs are rising because of rising costs of innovation and market revenue is lessening because of the shorter product life cycle in the market. This pushes companies to open their business models in order to get new revenues and cut development costs through leveraging external development (Chesbrough, 2007).

- **Networking.** Companies are joining networks for realizing joint business projects. Partnership networks give companies a possibility to strengthen their competitive advantage and to maximize the profits through acquiring resources and capacities it doesn't have. In addition to that, partnership networks are a great basis for sharing knowledge, experience and risks.

- With the rise of new technologies, communication services and digitalization the **boundaries between industries are blurring**. For the pharmaceutical industry it means that the established distribution pipeline, which is used to go from the laboratory to the pharmacy, is not working any more. Pharmaceutical companies should establish a strong network between educational institutions, public services and customers to be able to have sustainable growth.

As a result of the trends mentioned above, the old business models are not efficient for pharmaceutical companies any more. Companies should reshape the way of doing business to stay competitive and to sustain growth.

1.3. Purpose and research question

The purpose of the following study is to clarify the major shifts in the business models in the pharmaceutical industry due to the changes in the business environment and industry itself. The theoretical framework of the study implies the use of the business canvas concept for illustrating the business architecture of pharmaceutical companies. Therefore, the paper is focusing on the firm-level analyses.

Research question of the following paper concerns the importance of the shift in the business models in pharmaceutical industry. The paper is seeking to answer the following questions:

- ***What is the old business model in pharmaceutical industry?***
- ***What is the new business model in pharmaceutical industry?***
- ***What are the major difference between old blockbuster business model and new alternative model?***

- ***What is the shift in business models in pharmaceutical industry in the recent decades?***

This study adds to the literature on business models in pharmaceutical industry and sheds light on the importance of the shift in business models for the pharmaceutical companies. The purpose of the empirical part based on the qualitative research is to give a deeper insight into the alternative new business models in the pharmaceutical industry.

1.4. Thesis outline

The following study focuses on two major blocks of issues: the business model concept and the pharmaceutical industry`s development. The first part of the paper is devoted to the theoretical framework and modeling. The Introductory chapter gives an overview of the theoretical framework used for the further research, as well as presents a problem discussion and research questions of the paper. The second chapter presents the literature review and the theoretical framework. Also the discussion about the business model and business model canvas concepts are further presented. Two theoretical models (the old blockbuster and the alternative defragmented business models) for pharmaceutical companies are constructed and compared.

The third chapter of this paper sheds light on the pharmaceutical industry by highlighting the major trends and shifts which occurred during the recent few decades. The empirical part (chapters four and five) is devoted to an in-depth study of the pharmaceutical companies in Skåne region, Sweden. The business models of two pharmaceutical companies are built based on the theoretical framework and compared with theoretical projections of old blockbuster and alternative defragmented models. The last chapter covers discussion and conclusions.

2. Literature review and theoretical framework

The following chapter presents a discussion on the business model concept among various practitioners and scholars. The definition of the business model is synthesized on the basis of analysis of different theoretical approaches and the business model used for the further research is specified and explained. The final section of the chapter is devoted to the theoretical discussion about the business model's elements and their detailed explanation.

2.1. Business model concept

Though the term "business model" has become an inevitable part of managers' and scholars' vocabulary, there is still no generally accepted definition for it. Differences in definition cause challenges and often misunderstandings about the structural nature, its components and the functions of the business model. The absence of a unified definition also causes confusion in terminology – the term "business model" is often mixed with such terms as strategy, revenue model, economic model etc. (Morris et al., 2005). Moreover, as a result of theoretical and standard ambiguity in definition and, relatively, in general understanding, there is a confusion in practical implication of the business model concept (Shafer et al., 2005).

A business strategy and business model are often used as a similar terms. The roots of such confusion lie in the absence of an agreed definition of both terms.

A business model is not a strategy itself, but it determines and reflects the company's strategic choices and their operating implications. A properly identified business model can be a great strategic tool for the company (Shafer et al., 2005). Using business model as a canvas describing how company operates in a business environment gives that company a possibility to react quickly to the changes which continuously occur in the business landscape. Business modeling also helps company to analyze its place at the market and to see new possibilities for growth and development as well as for maintaining a competitive advantage.

The research made by Osterwalder et al. (2005) indicates that the term "business model" became extremely popular only 2 decades ago. Existing business model literature usually concentrates on

one of the two blocks of issues: either the product, business actor and network aspects (Afuah and Tucci 2001; Chesbrough and Rosenbloom, 2000) or marketing specific aspects (Weill and Vitale, 2001; Magretta, 2002; Petrovich et al., 2001).

Another distinction between different authors is in their way of presenting business model concept – some of them only provide a definition and some of them try to decompose a business model into smaller interrelated elements. The deconstruction of the business model is crucial for understanding of the incentives and patterns of business model's functioning and giving it practical meaning. Similarly to the definition, there is no common structure of the business model among scholars. Table 2.1 presents a summary of the definitions and business model components defined by different authors. Since the deconstruction of business model into elements is the only useful tool for business planning which helps to describe and understand business logic of the firm, authors who attempted to design both – definition and decomposition of business model - are considered in this paper.

Authors	**Definition**	**Components**
Afuah and Tucci (2001; 2003)	Activities that allow a firm to make money in a sustainable way	Customer value, scope, pricing, revenue source, connected activities, implementation, capabilities, sustainability
Amit and Zott (2001)	Architectural configuration of the components of transactions designed to exploit business opportunities	Novelty, lock-in, complementarities and efficiency
Chesbrough and Rosenbloom (2000)	Framework that takes technological characteristics and potentials of the company as inputs, and converts them through customers and markets into economic outputs	Value proposition, market segment, value chain, competitive strategy, value network, cost structure and profit potential
Johnson, Christensen and Kagermann (2008)	Composition of 4 interlocking elements which, taken together, create and deliver value	Customer value proposition, profit formula, key resources and key processes
Magretta (2002)	Story that explains how enterprise works	Two elementary parts: business activities associated with making something (e.g. design, procurement, and manufacturing)

		and business activities associated with selling something (e.g. customer identification, selling, transaction handling, distribution and delivery)
Osterwalder et al. (2005)	Description of the value a company offers and, at the same time, a description of the architecture of this company and its network for creating, marketing, and delivering this value with the purpose to generate profitable and sustainable revenue streams	9 building blocks: value proposition, key activities, key resources, partner network, cost structure, client relationship, client segments, distribution channels and revenue flows
Petrovic, Kittl et al. (2001)	Logic of a business system for creating value	Seven sub-models, which are the value model, the resource model, the production model, the customer relations model, the revenue model, the capital model and the market model
Weill and Vitale (2001)	Description of roles and relationships among consumers, customers, allies and suppliers and it identifies the major flows of product, information and money, as well as the major benefits for participants	Strategic Objective and Value Proposition, Sources of Revenue, Critical Success Factors, Core Competencies

Table 2.1. Definition and components of the business model by authors

Scholars often describe business model through abstract categories which makes it difficult to capture the precise meaning and importance of the business model. For example, Magretta (2002) defines business model as a story that explains how enterprise works. Following the same line of explanation, Afuah and Tucci (2001) present business model as a set of activities that allow a firm to make money in sustainable way. Petrovic and Kittl (2001) explain business model as the logic of a business system for creating value. Though these explanations are reasonable in their general meaning, their practical implication is questionable because of lack of precision and clarity.

A more accurate explanation and definition of the business model is presented by Weill and Vitale (2001) through the description of the roles and relationships among consumers, customers, allies and suppliers which identifies the major flows of product, information and money, as well as the major benefits for participants. Following the product-centric approach, Osterwalder et al.

(2005) presents a business model as a description of the value which company offers and, at the same time, description of the architecture of this company and its network for creating, marketing, and delivering this value with the purpose to generate profitable and sustainable revenue streams.

Amit and Zott (2001) suggest that business model is an architectural configuration of the four major components (novelty, lock-in, complementarities and efficiency) which are constructed for the discovery and utilization of business opportunities. Similarly, Johnson at al. (2008) are building their concept around the business model which implies a composition of four interlocking elements (customer value proposition, profit formula, key resources and key processes) which create and deliver value in interaction with each other.

For the purpose of the following paper definition suggested by Chesbrough & Rosenbloom (2002) is used:

"A Business model is a framework that takes technological characteristics and potentials of the company as inputs, and converts them through customers and markets into economic outputs."

The above definition provides a coherent and complex understanding of the meaning of business model. Since this definition goes in line with the business model concept suggested by Osterwalder (2004), it will be further modified for the purpose of this research.

Confusion about the business model components is resulting from the lack of clarity and unified structure leads to limitations in practical implication of the concept. Thus, while Magretta (2002) configure only two elements of business model – business activities associated with making something and business activities associated with selling something, Chesbrough and Rosenbloom (2002) decompose business model into six parameters - value proposition, market segment, value chain, competitive strategy, value network, cost structure and profit potential. The choice of the business model architecture in this case should be driven by criteria of simplicity and perspicuity of the elements included. The above presented business model's

deconstructions are suffering from the limited practical implication: simplicity of Magretta's (2002) approach doesn't allow to present the whole picture of the company's business structure, while the approach suggested by Chesbrough and Rosenbloom (2002) is lacking structural clarity for business modeling.

Weill and Vitale (2001) define strategic objectives and value preposition, source of revenue, critical success factors and core competencies as major building blocks of the business model. Similarly, Johnson et al. (2008) point out four interlocking elements that create and deliver value together: customer value proposition, profit formula, key resources and key processes. Afuah and Tucci (2001) completed value proposition, revenue source, connected activities and capabilities with such elements as scope, pricing, implementation and sustainability. Though the structural elements presented by the authors above are more clearly defined, there is a lack of practical explanation of those elements for detailed business modeling.

Similar approach but different categorization has been used by Petrovic and Kittl (2001) who deconstructed business model into seven sub-models: value model, the resource model, the production model, the customer relations model, the revenue model, the capital model and the market model.

In contrast to the business concepts presented above, Osterwalder et al. (2004) made the most detailed and practical description of the business model's structure presenting business model as a description of the value which company offers and, at the same time, description of the architecture of this company and its network for creating, marketing, and delivering this value with the purpose to generate profitable and sustainable revenue streams. The business model suggested by Osterwalder (2004) was further transformed by Osterwalder and Pigneur (2009) into the business models canvas – a managerial tool for business model construction.
Since the concept suggested by Osterwalder (2004) presents the most comprehensive and detailed view of the company's business model and suggests convenient practical tool for business modeling (business model canvas), it is used in the paper as a major theoretical framework.

2.2. Business model specification: final definition and concept

Osterwalder (2004) points out four business model pillars which contain nine building blocks (Figure 2.1).

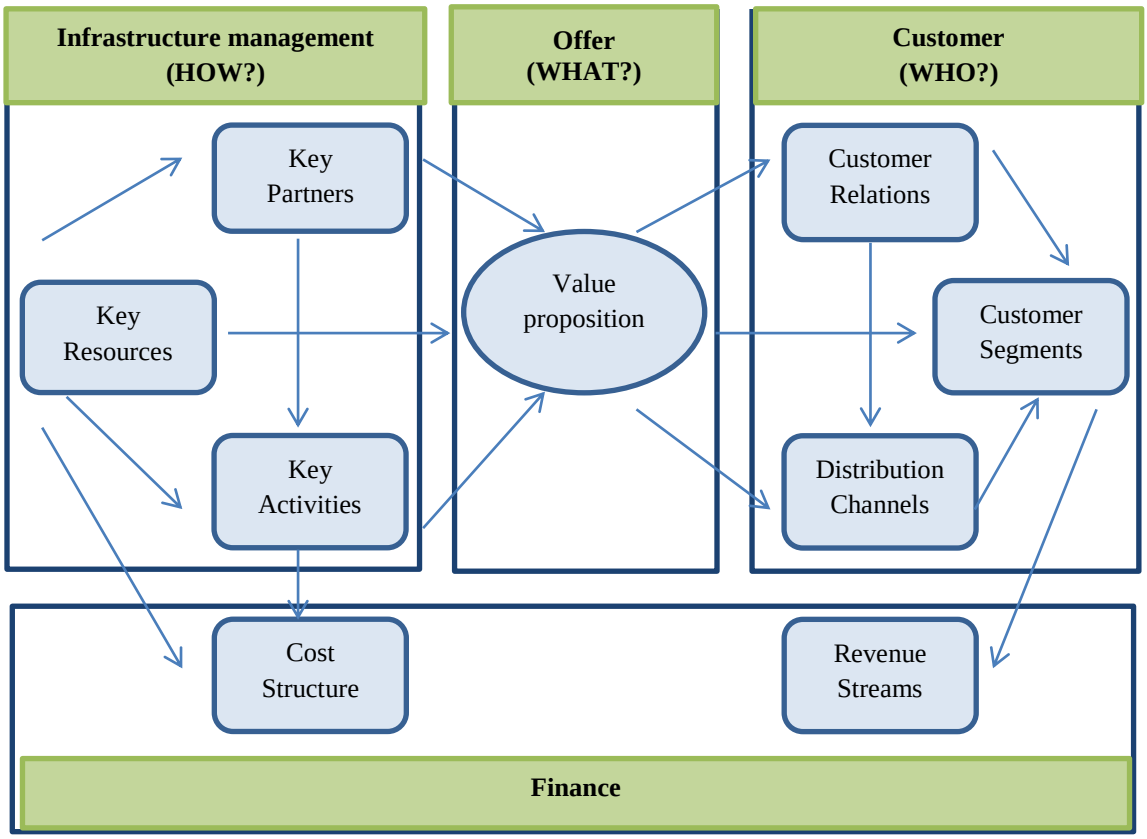


Figure 2.1. Business model by Osterwalder (2004)

A central pillar in the model is **value proposition** – it contains the overall view of the company's bundle of products and services and answers on the question "WHAT does the company offer?"

The second pillar, built on three business blocks (key activities, key resources and key partners), contains information about **infrastructural management** and answers the question "HOW does the company do that?". Key partners outline a partnership network needed for offering and the commercializing of the value proposition (e.g. outsourcing). Thus key partners influence a set of key activities company performs for execution of the actual business model. Similarly, there is a link between partnership network and key resources of the company – business networks help

companies to outsource those capabilities which are not of a core importance for them and to strengthen those capabilities, which give competitive advantage to the company. Key partners and key resources blocks determine the cost structure of the company which is part of the **finance pillar**.

The infrastructure management pillar together with the cost structure block determines and deliver value proposition to the target customers. Key partners outline a partnership network needed for offering and the commercializing of the value proposition (e.g. outsourcing). Thus key partners influence a set of key activities company performs for execution of the actual business model. Similarly, there is a link between partnership network and key resources of the company – business networks help companies to outsource those capabilities which are not of a core importance for them and to strengthen those capabilities, which give competitive advantage to the company. Key partners and key resources blocks determine the cost structure of the company which is part of the **finance pillar**. The infrastructure management pillar together with the cost structure block determines and deliver value proposition to the target customers.

The **customer pillar** is answering the question "WHO will consume our offer?" and consist of three blocks: customer relationships, customer segments and distribution channel. Value preposition itself is a predominant factor for customer segment (target customer) establishment, customer relationship (links between the company and different customer segments) maintenance and distribution channel (various means a company uses to reach the customers) implementation. The second part of the finance pillar, revenue stream, depends on the customer segment block (if the target customer consume the company's offer, it will raise revenue streams). A revenue stream, in turn, influence value proposition itself (Osterwalder, 2004).

This simple model covers the all major components needed for the business model description and projection. The business model concept developed by Osterwalder (2004) suffers from the lack of practical implication in the definition of the business model itself. For this reason, definition suggested by Chesbrough & Rosenbloom (2002) can be modified within Osterwalder's (2009) concept:

"A business model is a framework that takes a company's technological characteristics and potentials built on key activities, key resources and key partners as inputs and converts them through target customer segments, customer relations and markets as a distribution channel into economic outputs by means of value proposition (product or service offering) creation and delivery".

On the basis of business model developed by Osterwalder (2004), Osterwalder and Pigneur (2009) presented business model canvas. Business model canvas (Osterwalder and Pigneur, 2009) is a practical template based on the theoretical business model (Osterwalder, 2009). As it is illustrated on the Figure 2.2, business model canvas consists of the same elements as presented above model by Osterwalder (2004) (Figure 2.1).

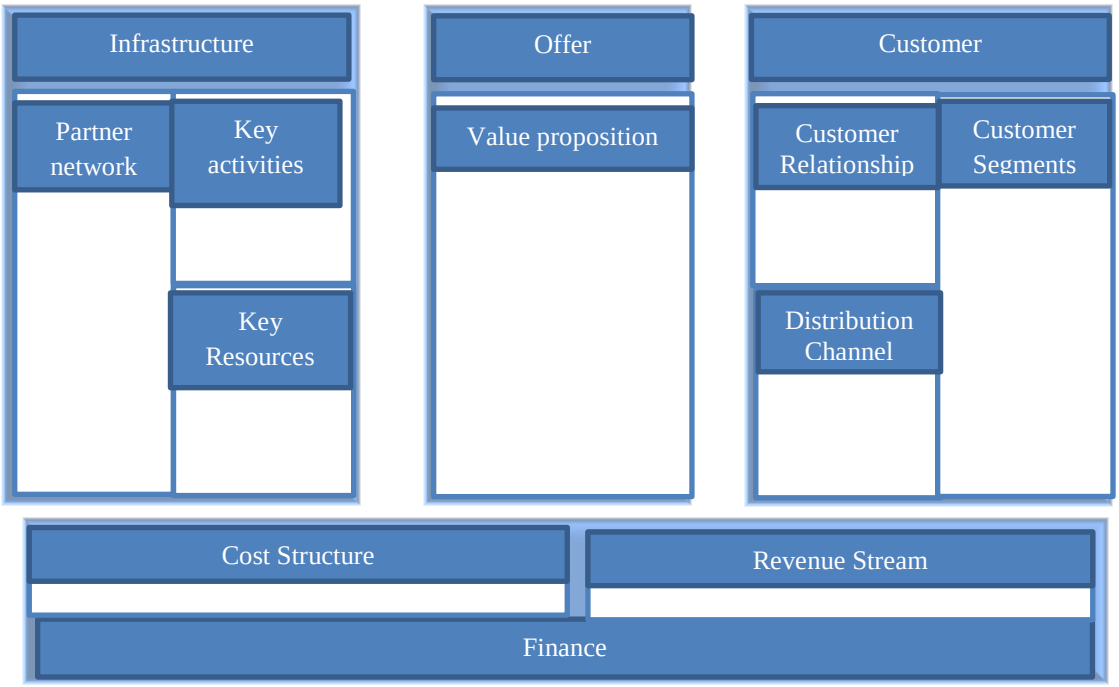


Figure 2.2. Business model canvas by Osterwalder and Pigneur (2009)

Variety of business model's formulations doesn't guarantee practical applicability of all those models. As a result of interactions between globalization and increasingly rapid technological development, it has become harder for managers to make a choice concerning their value proposition, value network, partners and the ways to reach the customer etc. (Archibugi and Iammarino, 2002).

The theoretical framework of the business model concept is only useful for the companies if they can understand it and project it onto reality – thus the managers will managers understand what their business is and how should they execute it. For that reason Osterwalder and Pigneur (2009) suggested that company should visualize their business model by using business model canvas.

Building company's business model requires clear understanding of each business model's pillar – so that the manager can use is as a strong analytical tool for visualization of his/her business model. The following subsections provide detailed description about the four pillars of the business model suggested by Osterwalder (2004): value proposition, customer interface (which consists of the three blocks: customer relations, distribution channel and customer segment), infrastructure management (which consists of three blocks: partnership network, key resources and key activities) and financial aspects (which consists of two blocks: cost structure and revenue streams).

2.2.1. Value proposition

As it is illustrated on the Figures 2.1 and 2.2, value proposition is a central pillar in the business model. The all other pillars are either involved into creation of this value proposition, or into its delivery to the customers for the final purpose of getting revenues.

Osterwalder (2004) suggested that value proposition and its offerings should be analyzed in the light of the following attributes: reasoning, life cycle, value level and price level. Table 2.2 summarizes meaning and classification of each attribute.

Attribute	**Explanation**	**Classification**
Reasoning	Why the firm thinks its value preposition or a specific elementary offering could be valuable to the customer	How is value created: - use; - risk; - effort.
Value level (customer utility)	Measuring the utility for the customer by measuring the value level of a company's offer allows a firm to compare itself to its competitors	Measure: - me-too value; - innovative imitation; - excellence; - innovation.

Price level	The comparison of the value proposition's price level with the one's of their competitors	Scale: - free; - economy; - market; - high-end
Life Cycle	Capturing at which stage of the value life cycle an elementary offering creates value	Stages of the value life cycle: - customization; - purchase; - use; - renewal; - transfer

Table 2.2. Attributes of value proposition and its elementary offerings. Source: Osterwalder (2004)

In the business model suggested by Osterwalder (2004) value proposition covers all aspects which company offers to its customers: products, services or their combination, as well as product differentiation from competitors. Value proposition, delivered to the customers through a bundle of products and services consist of elementary offering(s) (Osterwalder, 2004). Being a part of value proposition, elementary offering stands for each specific product or service which company offers to the customer and represents the value which this offering deliver to that customer. A Company can better understand its position in the market by decomposing value preposition into elementary offerings and comparing them to competitors.

Each value proposition can create value for the customer in a different ways: through usage of the product (painkillers); reduction of the customer's risk (insurance offering); making customer's life easier through reduction of his efforts (hands free set). Designing new value proposition company should think about the reasons for becoming this specific offering valuable for the customer.

A comparative analysis of the company's product competitiveness can be done by customer utility evaluation. The value level of the offering starts with me-too value, when the company offers similar to the wide range of products proposition. Innovative imitation brings higher value to the customer through a reduced price for innovative elements added to existing products. Value can be also delivered to the customer through excellence: exclusive service or product offering for a high price. Innovation delivers value to the customers through offering new

products or services which can better satisfy customers' needs. Innovation places a high-end position in the value level evaluation scale because companies gain competitive advantage at the market through incomparable products and services (until the innovation is imitated) (Linder and Cantrell, 2000).

The price level of the offering can be measured according to the simple scale: from free and economy level to market and high-end level. A company's offering can also create value on different stages of a proposition's life cycle: at the moment of value creation itself (customization), at the moment of purchase (one-click shopping at Amazon), use (watching a movie), renewal (software updates) or transfer (selling of used things) (Osterwalder, 2004).

Value proposition, e.g. the product which companies offer to the customer is one of the core elements of the business model. Today's conditions at the market put companies in a difficult situation. From one side, such trends as globalization, emerging new technologies and shortening of the products' life cycle transformed traditional markets into rapidly changing arena for competition, where the boundaries between industries started to disappear. From another side, the emergence of active, informed and hyper-connected consumers changed prerequisites for products' demand and criteria for customers' choice of the product. It is easier to create a product variety today, but it is becoming harder to compete for value through product variety (Prahalad and Ramaswamy, 2003). Companies increasingly organize in networks creating a bundle of products or services which are offered together as a customer solution which has a higher value than the product itself.

Changes at the market, shaping the business landscape, make companies to rethink their value preposition and even entire business model (Osterwalder, 2004). Those companies who are able to innovate and transform value preposition quickly according to the customer's needs and rapid market changes are becoming market leaders nowadays (Kim and Mauborgne, 1997).

Simple analysis of value proposition according to the four above described attributes is a helpful tool for the company to position its offering at the market, to point out its strength and advantages in comparison with competitors, as well as to figure out possible places of improvement or space for new product or services implementation.

2.2.2. Customer interface

According to Osterwalder's (2004; 2009), the customer interface pillar covers everything which is related to the customer. The three blocks included into the customer interface are target customers, which build different customer segments; channels, through which value is distributed and delivered to target customers; and relations between customers and companies. Table 4 presents a summary of the elements included into each block of the customer interface pillar.

Business model block	Explanation	Components
Customer segments	Target customers	- B2B customers - B2C customers
Channels	Distribution and delivery of the value proposition	- Direct - Indirect
Customer relations	Relations between the company and target customer	Ways of supporting relations: - Acquisition - Retention - Add-on selling Mechanisms: - Personalization - Trust - Brand

Table 2.3. Customer interface blocks. Source: Osterwalder, 2004

Segmentation of target customers is of core importance for the company's business strategy. Precisely specified group of customers helps the company to make a good allocation of its resources – so that the offering will deliver value to those customers who are really interested in it.

Distribution channel consists of different links between the company and customer. This business block describes how the company delivers value to the customers. The major shift in distribution channels' configuration today is caused by progressive development of information and communication technologies (ICT) – more and more distribution channels are shifting to the ICT space (on-line shops, e-commerce, m-commerce). Besides, some changes occurred in the structure of distribution channel itself. While traditional channel links two actors – supplier and

customer, there are more and more intermediaries appearing which place themselves in between those two actors. One of such intermediaries is a platform, which brings together groups of users in two-sided networks. Blockbuster products and services which dominated at the market for a long time link together two types of users in the network – suppliers and customers.

Customer relations' block contains data on relations established between the company and its customers. Clearly defined customer segments to which company address its value proposition should be continuously supported and communicated by different mechanisms. The strategy of the company on whether to focus on acquisition of new customers from specified segment, retention of old customers or add-on selling to existing customers should be guided by the type of value offering as well as by customer segment specificity. The defined strategy of customer relations can be implemented through different mechanisms.

Personalization as a mechanism of customer relations stands for several things. First, it stands for personalized relations with the customer – learning his/her buying habits and product preferences, maintaining dedicated personal assistance etc. In this case one-to-one marketing relationship stands on the first place. Second, personalization stands for one-to-many relationship – from company to a group of customers with the certain needs (Osterwalder, 2004). Besides, each customer can participate in value creation through collaborative community. An advantage of this mechanism is not only in having an active feedback from the customer, but in the customer's participation in the process of value proposition creation, i.e. customer's direct involvement into the product improvement, e.g. through on-line communities (Gloor and Cooper, 2007).

Trust has become another important issue in customer relations – sustaining trust between the company and the customers by different means (guarantees, risk reduction mechanism) is a prerequisite for long-term relations between them. Another important mechanism of customer relations is branding. The value of the brand is not limited with a mechanism of customer relations support – it also constitutes a part of competitive advantage of the value proposition. A brand is influenced by every interaction with the customer and it absorbs new customers from the same segment by automatically generated trust (in case of positive branding).

Designing of the customer interface is a helpful tool for the company to visualize its target customers' segment, as well as the ways of supporting and communicating with it.

2.2.3. Infrastructure management

According to Osterwalder (2004), the infrastructure management pillar describes how company creates value and consists of three interrelated blocks: core capabilities (key resources), value configuration (key activities) and partnership networks (key partners). These three business blocks contain information about the abilities of the company to provide value proposition to the target customers and abilities to support relations with those customers. The infrastructure management pillar specifies a company's main activities to execute business, its in-house core capabilities and those acquired through a partnership network.

The core capability block is based on the set of resources possessed by the company. These resources can be classified into tangible, intangible and human resources (Osterwalder, 2004). Tangible resources include plants, equipment and cash reserves; intangible resources cover intellectual capital (patents, copyrights, brands) reputation and trade secrets; human resources include people who create value with the help of tangible and intangible resources.
It is of strategic importance for a company to define its core competence and to build a competitive advantage on it. The shift that can be noticed today is that successful companies open their business models and outsource those capabilities which are not core for them. Rising costs of innovation together with shorter product life cycle in the market result in that companies with closed business models loose their profitability. The companies with open business models are able to get new revenues from out-licensing, spinoffs and sales and save cost and time from leveraging external development (Chesbrough, 2007).

Wallin (2000) categorizes resources among two axes – internal-external and customer-resources, and points out four types of company's capabilities: resource-integration, generative, customer-interaction, and transformative capabilities, as it shown in the Figure 2.3.

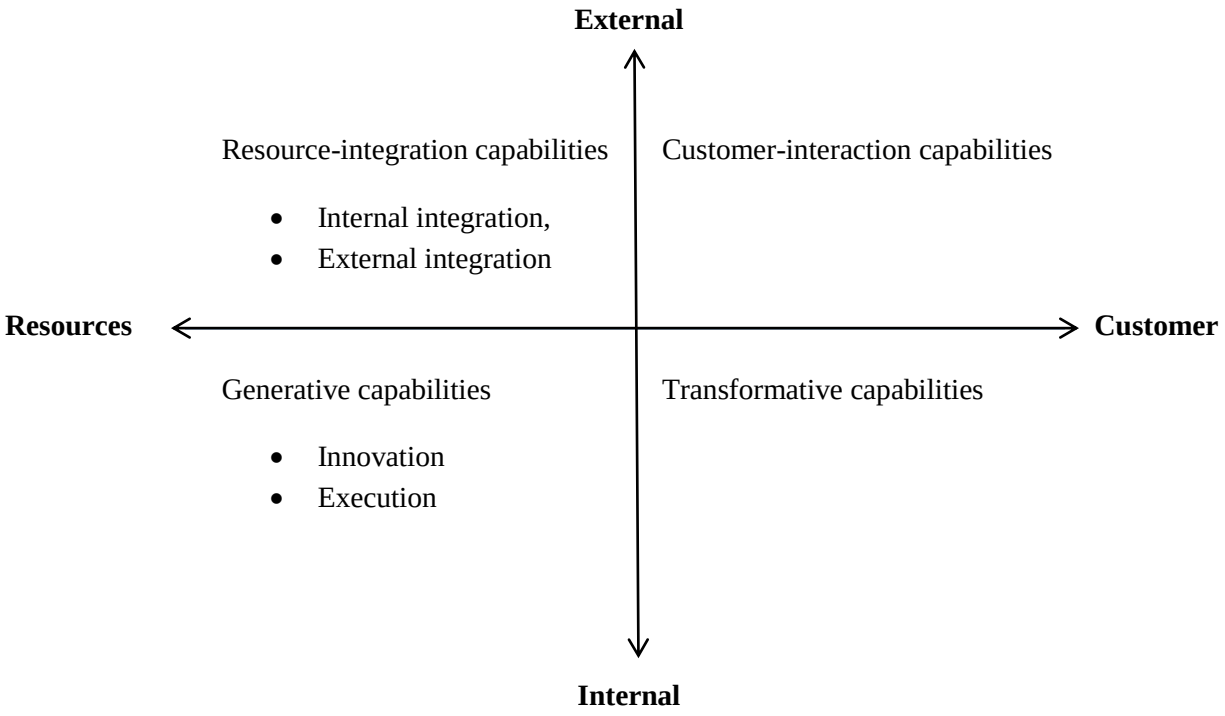


Figure 2.3. Capabilities according to Wallin (2000)

Resource-integration capabilities cover a company's ability to deploy its assets and capabilities inside (internal integration) and outside (external integration) the company. The generative capabilities include those core in-house capabilities necessary for the creation of the value proposition. This can be done either through innovation (R&D) or through execution (production). The customer-interaction capabilities include abilities necessary for customer relations' maintenance. The transformative capabilities "refers to the ability to combine bundles of product traits that in terms of physical, service, and people content have the threshold traits required by each customer and which can be offered at costs less than their perceived value creating potential." (Wallin, 2000).

The value configuration consists of key activities the company executes to create value proposition on the basis of available resources (either owned or partners´ resources), as well as links between those activities. All the necessary activities are performed either by the company itself or by its partners. The partnership network visualizes resources and those parts of value configuration which are distributed among a company's partners. In general terms, a partnership is a voluntary agreement between several business entities to carry out a joint project through

coordination of common resources, capabilities and activities (Osterwalder, 2004). Nowadays companies participate in business networks with the aim to increase their competitive advantage – a collaboration strategy helps companies to acquire capabilities they don't have internally and combines resources of several units if the business project implementation requires that (Wolthuis, 2010). In addition to that, partnership networks help companies to maintain optimization and economy of scale, as well as to reduce the risks and uncertainty (Osterwalder, 2004).

Osterwalder (2004) pointed out the following incentives for companies to participate in business networks:

- Partnership for customer acquisition;
- Partnership to acquire knowledge (building of knowledge webs (Eneroth, 2001);
- Partnership to share risks in developing new markets (Prahalad and Hammond, 2002);
- Partnership for financial outsourcing.

Key resources, key activities and key partners determine a company's competitive advantage and, thus, possibilities for sustainable growth and development. A company's strategy should be focused on building the best possible configuration of available resources and activities within the business network for the creation of competitive value proposition.

2.2.4. Financial aspects

According to Osterwalder (2004), the financial aspects' pillar covers the revenue model and cost structure and is an outcome of the configuration of other business model's blocks. The revenue streams and cost structure explain company's profit and loss-making strategy. In other words, the financial pillar defines how company creates value for itself through creation and delivering value to the customers (Johnson et al., 2008).

Osterwalder (2004) points out two elements of the revenue streams block – revenue stream itself and pricing. Dependently on the value proposition, a company's business model can include one

to several revenue streams (each offering can have its own revenue stream) with different pricing mechanisms. The different stream types and pricing mechanisms are shown in the table 2.4.

The different revenue streams are based on the kind of value proposition and the way company monetizes it. The monetization of the value proposition can be maintained through different ways: through selling the product or service; through lending the product (leasing, bank loans etc); licensing or franchising; transaction cut (fee for using matchmaking facilities for suppliers and buyers); advertising. The pricing mechanisms can be divided into three main groups: fixed pricing, differential pricing and market pricing dependently on characteristics which determines the pricing process.

Market pricing is dependent on the real-time market conditions and includes bargaining between buyers and sellers for the price; yield management (maximizing profits from perishable assets); auction and reverse auction (which has become extremely popular with the rise of the internet); dynamic market (when the price is dictated by the market conditions). Differential pricing doesn't depend on real-market conditions – the major factors which determine the price in this case are volume, consumer (or product) characteristic, or customer preferences.

Differential pricing can be product feature dependent (the price of the product or service is determined by the features included in it); customer characteristic dependent (knowing the customer behavior allows to put the price for the product or service according to the customer's characteristics); volume dependent (the price is dependent on the volume of product purchased by the customer); value based (dependent on how much the customer is ready to pay for the value delivered with the product or service). Finally, fixed pricing is not dependent on any of the above mentioned factors. Fixed pricing include pay-per use (customer pay per every unit of used production or service); subscription (customer pays a flat fee); menu pricing (fixed price with is set in the catalogue).

Pricing mechanism	Description	Type
Fixed pricing	• Do not differentiate in function of customer characteristics; • Volume independent; • Are not based on real-time market conditions.	Pay-per use
		Subscription
		List price/menu price
Differential pricing	• Are not based on real-time market conditions; • Either volume dependent; • Or based on consumer or product characteristic; • Or linked to customer preferences.	Product feature dependent
		Customer characteristic dependent
		Volume dependent
		Value based
Market pricing	• Based on real-time market conditions.	Bargaining
		Yield management
		Auction
		Reverse auction
		Dynamic market

Table 2.4. Pricing mechanisms. Source: Osterwalder, 2004

The cost structure block includes the all costs spent by the company for creation, marketing and delivering value to the customer. According to Osterwalder (2004), the cost structure together with the value proposition determines whether the company is value-driven or cost-driven. A value-driven company focuses on the delivery of the high qualified products and services – that is why they don't concentrate on the cost reduction strategy. In opposite, cost-driven companies are trying to reduce costs for value proposition creation and make their products or services more accessible through a lower price.

Analysis of all the building blocks of a company's business model illustrates the way this company functions and makes money. Together with rapidly changing market analysis, the business model construction is a perfect tool of identification of strong and weak places in company's strategy for sustainable growth. The theoretical framework described above will be

used in the further research for analyses of the shifts in business models in pharmaceutical industry in recent decades.

3. Pharmaceutical industry overview: challenges and perspectives.

The following chapter presents an overview of the global pharmaceutical industry, its major trends and challenges. Two business models – the old blockbuster business model and the alternative defragmented business model are conceptualized on the basis of the theoretical framework highlighted in the previous chapter.

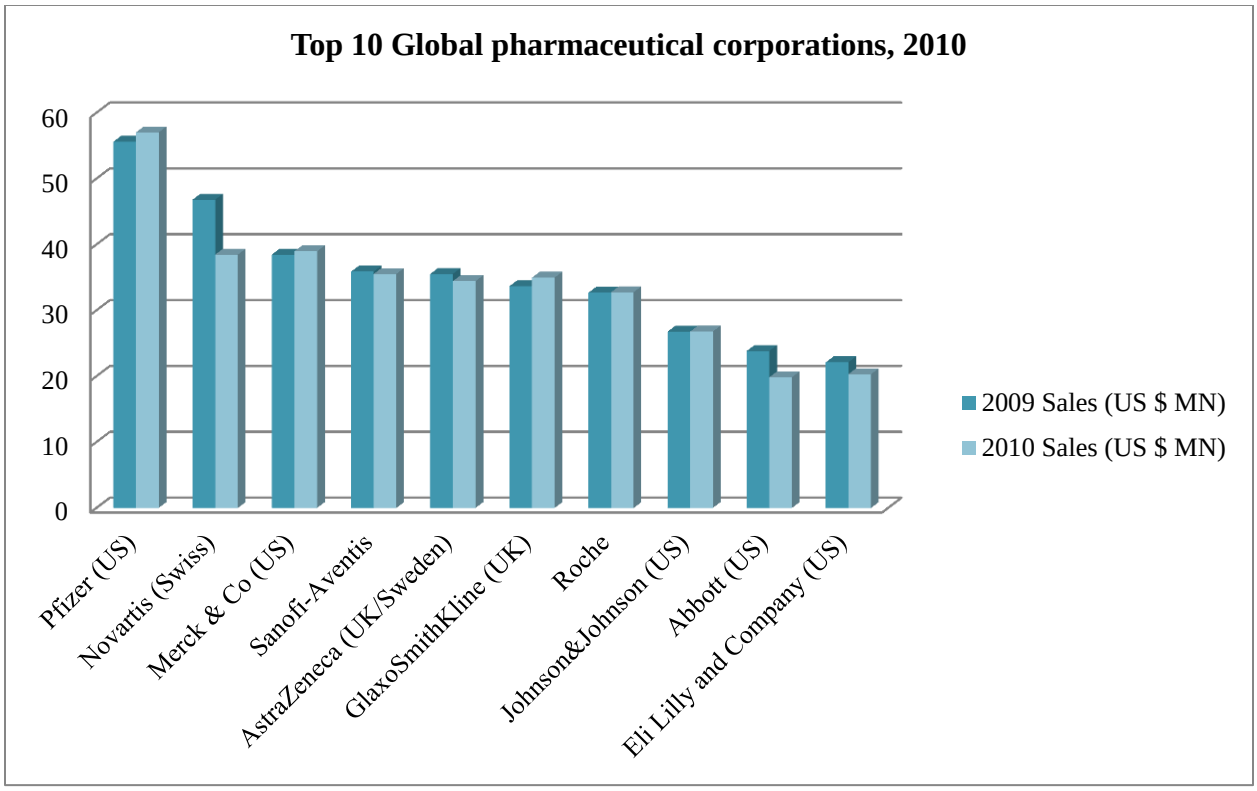
3.1. Overview of the pharmaceutical industry

The pharmaceutical industry is characterized by the risky and lengthy R&D process, severe competition for intellectual property, restrictive governmental regulations and strong purchase pressures (Bátiz-Lazo and Holland, 2001). Though all mentioned features put high pressure on the companies operating in the pharmaceutical industry, the size of the pharmaceutical market is growing. According to Seget (2010), the global pharmaceutical market grew to $808 billion in 2009, at a compound annual growth rate of 9.3% between 1999 and 2009 which indicates quite high industry growth. Seget (2010) estimated the global pharmaceutical industry to grow to 1,033 billion in 2014.

Traditionally, the business model of the pharmaceutical companies has been built around the blockbuster drugs, which supposed to bring high sales revenues. According to Seget (2010), the existing top 100 blockbuster drugs have already generated sales of US$285 billion. There are around 125 blockbuster drugs in total generated more than $1billion each in global sales. To exemplify, one of the top blockbuster drugs is Lipitor – cholesterol-lowering medication produced by Pfizer with sales US$ 13,28 billion in 2009 and US$12,6 billion in 2010 (IMS report, 2011). Table 3.1 illustrates the sales volume of the top five blockbuster drugs in 2009 and 2010. Table 3.2 and Graph 3.1 present the biggest pharmaceutical companies in terms of sales in 2010.

No	Brand	Company	2009 Sales (US $ BN)	2010 Sales (US $ BN)
1.	Lipitor	Pfizer, Astellas	13.28	12.66
2.	Plavix	Bristol Myers Squibb, Sanofi Aventis	9.1	8.82
3.	Remicade	J&J, Merck, Mitsubishi Tanabe	5.4	6.04
4.	Advair	Glaxo Smith Kline	8.09	8.47
5.	Enbrel	Amgen, Pfizer, Takeda	5.8	6.17

Table 3.1. Top five blockbuster drugs. Source: IMS Health Midas, December 2010



Graph 3.1. Top 10 Global pharmaceutical corporations, 2010, Total Audited Markets.

Source: IMS Health Midas, December 2010

Rank (2010)	Company	2010 Sales (US $ MN)	2009 Sales (US $ MN)	2011, Fortune 500 revenue (US $ MN), / Fortune 500 rank
6.	Pfizer (US)	55,602	57,024	67,809 / 31
7.	Novartis (Swiss)	46,806	38,460	-
8.	Merck & Co (US)	38,468	38,963	45,987 / 53
9.	Sanofi-Aventis	35,875	35,524	-
10.	AstraZeneca (UK/Sweden)	35,535	34,434	-
11.	GlaxoSmithKline (UK)	33,664	34,973	-
12.	Roche	32,693	32,763	-
13.	Johnson&Johnson (US)	26,773	26,783	61,587 / 40
14.	Abbott (US)	23,833	19,840	35,166 / 69
15.	Eli Lilly and Company (US)	22,113	20,310	23,076 / 115

Table 3.2. Top 10 Global pharmaceutical corporations, 2010, Total Audited Markets.

Source: IMS Health Midas, December 2010

Nowadays the biggest challenge for the blockbuster companies is patent expiries of the branded drugs (blockbusters) and high proliferation of generic drugs. According to the Center for Drug Evaluation and Research (n.d.), generic drugs are "drug products comparable to brand/reference listed drug products in a dosage form, strength, route of administration, quality, performance characteristics, and intended use". According to the IMS report (2011), the market share for blockbuster drugs fell from 70% in 2005 to 64% in 2010 and is expected to drop to 53% in 2015. The Datamonitor report (2010) states that blockbuster patent expiries in 2010 have led to erosion of $78 billion in global branded sales of drugs. From the customers' perspective, patent expiries will save payers $120 billion by 2015 compensated by $22 billion of generic drugs (IMS report, 2011).

Chitra (n.d.) denoted that one of the major challenges for pharmaceutical companies is uncertainty – making huge investments in the development of new drugs, including all phases of development process, doesn't mean that the company will succeed bringing the drugs to the market.. Increasing spending on R&D results in a decreasing number of drugs approved and commercialized – so called "productivity paradox" has become typical for the pharmaceutical industry. For the fully integrated blockbuster pharmaceutical company[2], which contains the whole process of the drug development and commercialization, such uncertainty can have dramatic outcomes – the return on investment (ROI) is lower than the industry's risk adjusted cost of capital. Gilbert et al. (2003) pointed out four major reasons for reduction in expected ROI from the launch of the new drugs:

- Shorter exclusivity periods;
- Declining R&D productivity;
- Rising costs of commercialization;
- Increasing payor influence.

[2] For the purpose of this study, blockbuster (pharmaceutical) company – pharmaceutical company with blockbuster business model

To a large extend, shorter exclusivity periods can be explained by emergence of generic drugs. The length of the drug`s development process is longer than the period of drug's exclusivity at the market – generic drugs are coming into the competition and, due to the lower price, acquire bigger market share.

The productivity paradox in the pharmaceutical industry is a consequence of the high costs and lengthy development time of launching new drugs to the market, strengthened with growing regulatory and economic pressure **(**Litinski, 2010**).** As a result, revenue growth with decreasing margins has become typical for the pharmaceutical industry today (PriceWaterHouseCooper`s report, 2009). To overcome this challenge, pharmaceutical companies should focus their R&D efforts on a specific segment – either on a specific customers segment or on specific kind of medicines. Another important issue for pharmaceutical companies is the shift towards partnership – from a "profit alone" path to a "profit together" path (PriceWaterHouseCooper`s report, 2009). Partnership networks help companies to reduce the risk and volatility, and help to concentrate on the firms competitive advantages. Companies should outsource capabilities which are not core for the activities they execute (for example administration or manufacturing) (Gilbert et al, 2003). As Chitra (n.d.) noticed, pharmaceutical companies should leverage their value chain and recapture value by focusing on particular parts of the value chain. Focusing on core activities in combination with out-sourcing and in-sourcing will help companies to improve their R&D productivity and to mitigate risks.

Rising costs of commercialization is a result of a rigid supply chain in the pharmaceutical industry. According to PriceWaterHouseCooper`s report (2009), an increasing emphasis on outcomes which covers the expansion of the pharmaceutical industry to the health management service, leaner cost structure with diminishing margin growth, as well as a new structure of health care delivery are pushing pharmaceutical companies towards fragmentation and closer cooperation with their customers.

Increasing payor influence can reveal in several ways. On the one side, it is based on the highly-informed customers, who want not only better medicines, but also satellite services with it (PriceWaterHouseCooper`s report, 2009). On the other side, pay-for-performance strategy

among the payors is becoming more popular. Customers are willing to pay for the outcomes. In addition to that, customers tend to shift their demand from the science driven therapeutics to customer solutions with the drug in the center (Gilbert et al, 2003).

Therefore, the blockbuster business model will not foster sustainable growth to the pharmaceutical companies in the future. Next generation of blockbuster medicines are likely to emerge from companies with a more specialized – defragmented - business model (Gilbert et al, 2003). Those pharmaceutical companies which are shifting to a diversified business models (with modular structure) with clear focus on activities based on the companies' available core capabilities, will be able to support sustainable long-term growth.

Two theoretically built business models will be conceptualized and compared in the further research – blockbuster business model and defragmented business model.

3.2. Blockbuster and defragmented business models in pharmaceutical industry: theoretical comparison

As it is illustrated in the Figures 3.2 and 3.3, the blockbuster business model has some significant differences from the alternative disintegrated business model. To start with, the first element in pharmaceutical business model, which is under attack, is its value proposition. The single offering which the blockbuster pharmaceutical company is striving to deliver to the market is a new blockbuster drug. The above offering creates value for the customer through usage of invented drug and is delivered through drug innovation. The price level of blockbuster drugs usually starts from the high end after the drug launch, but it comes down to the market price soon. The given offering creates value on the "use" stage of the proposition's life cycle. The blockbuster company's value proposition is both value- and cost-driven. From the one side, blockbuster pharmaceutical companies create drugs aimed at quality and innovation, but from the other – these drugs are aimed to gather revenues from high sale volumes among different customer segments. The main challenge for the pharmaceutical companies with value proposition block is short exclusivity period and competition with generic drugs. When patent protection for the blockbuster drug expires, generic drug immediately substitutes that drug at a lower price. As a result, generics are acquiring large market shares and blockbuster companies

are losing their revenues. Life licensing or out-licensed manufacturing can be a solution to that problem.

In comparison with the blockbuster model, the variety of value propositions in the defragmented model is much wider, because defragmented model focuses on particular part of the product pipeline. Recent trends show a movement towards including satellite services into the real product proposition: for example diagnostics (Osterwalder, 2005). All the attributes of the value proposition in a defragmented business model depend on the offering. For example, if a pharmaceutical company specializes on contract drug manufacturing, it will create value by effort reduction; deliver it through me-too value, innovative imitation or innovation (dependently on the manufacturing process); at a market price.

A customer segment and distribution channel blocks are the next in the queue to become a weak place in the blockbuster business model. The value proposition in the blockbuster model is aimed at the wide range of customers at the mass market – there is no clearly defined customer segment (target customers cover patients and doctors without any specifications). In contrast, the defragmented business model targets its value proposition at a niche market. It can be either a group of patients with a specific disease (diabetes); pharmaceutical companies which outsource drug development of special kind of medicines on early/late stages of development; pharmaceutical companies which outsource drug manufacturing etc. Concentration on niche markets together with delivering either cost-effective or high-quality value proposition will allow pharmaceutical companies to maintain certain customer segments through retention and, if necessary, add-on selling. While the blockbuster pharmaceutical companies are forced to spend more money on their blockbuster drug marketing than on the R&D of new medicines, the defragmented pharmaceutical companies can invest saved on promotion costs into the key activities. The blockbuster business model requires big advertising campaigns for their products which are quite costly and it excludes the possibility of personalized relationships with the customers. Acquired through advertisement customers are maintained mainly with branding mechanism. In contrast, a defragmented model is aimed at more personalized relations with customers, which gives company a possibility to have an active feedback and to participate in collaboration process with them for improving the quality of the value proposition.

Infrastructure management in the blockbuster business model has one distinction feature which determines all further structure of its building blocks – the all-in-house production. A blockbuster company keeps the whole production pipeline inside independently on its core capabilities. Furthermore, such pharmaceutical companies don't participate in any business networks, which increase uncertainty level and company's expenses on activities which are not key to its value proposition (it can be high costs of manufacturing, marketing or financial management inside the company).

The key resources of blockbuster company include generative capabilities (both - innovation and production) and internal integration capabilities. The key activities are built on the basis of these locked in the company resources – the blockbuster company maintains the production chain together with internal management. The defragmented model is focused on its core capabilities, e.g. capabilities on which a company can build a competitive advantage. In contrast with the blockbuster model, the defragmented model outsources those capabilities which are not core and insource those capabilities which are needed for value proposition delivery. Besides, the defragmented model reduces risks and uncertainty through participation in the business networks. Networking helps companies to acquire customers and to share knowledge for improving value proposition. The organization of the infrastructure pillar determines the structure of the financial pillar of these two models.

The biggest disadvantage of the blockbuster business model is the high risk of uncertainty – companies are making huge investments in new drug discovery and development without any risk diversification. Uncertainty in this case concerns the blockbuster drug launch at the market – there are no guarantees that the new drug development process will be successful and that it will be introduced to the market. As a result, the level of investments (mainly in research and development) of the new drugs often exceeds the cash flows in a later stadium from those drugs (ROI is lower than the companies cost of capital).

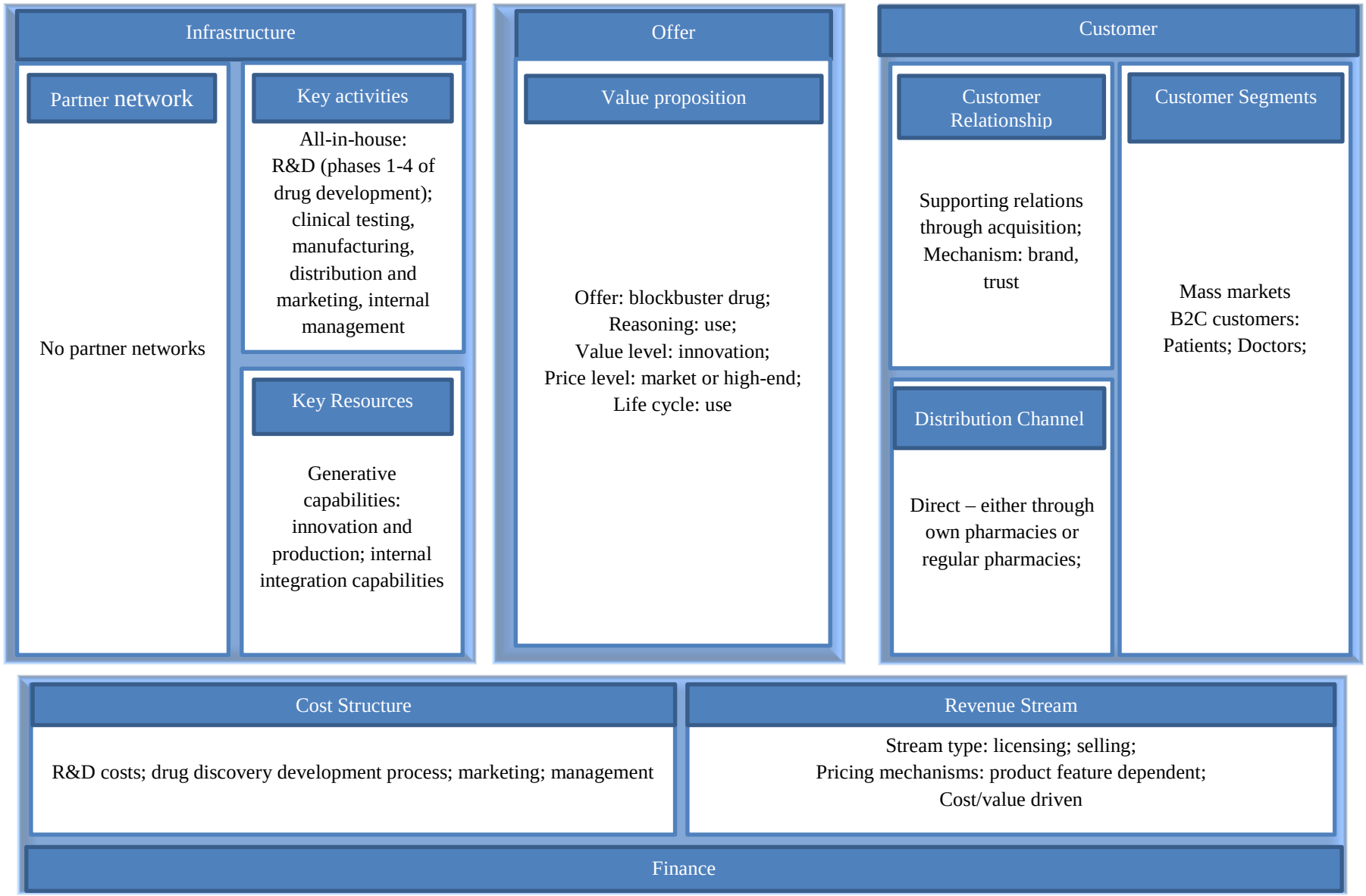


Figure 3.2. Blockbuster business model of the pharmaceutical company (conceptualized on the basis of business model concept by Osterwalder (2004) and business model canvas by Osterwalder and Pigneur (2009)

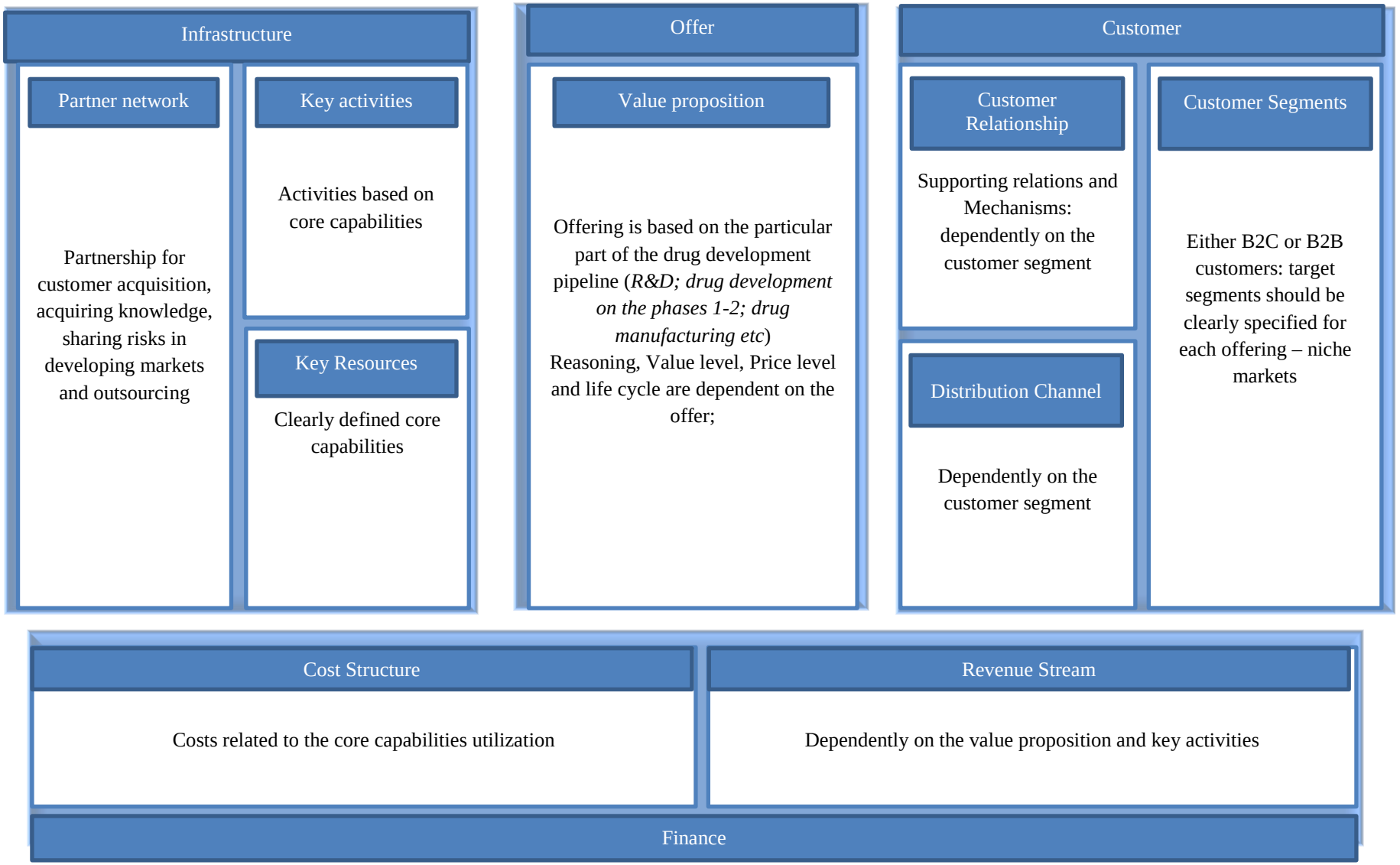


Figure 3.3. Defragmented business model of the pharmaceutical company (conceptualized on the basis of business model concept by Osterwalder (2004) and business model canvas by Osterwalder and Pigneur (2009)

The cost structure of the blockbuster business model includes expenses on R&D, drug manufacturing, marketing and internal management of the company. The revenue stream comes mainly from the high volumes of blockbuster drug sales and, sometimes, from licensing. Since the defragmented business model is focus-oriented, its cost structure is related to its core capabilities utilization. The revenue streams, respectively, are based on the core activities and kind of value proposition. For example, the revenue streams in the defragmented business model can come from the drug manufacturing if the company focus on contract drug manufacturing. The cost structure in this case will include fixed and variable production costs (considering economy of scale).

The two theoretical models illustrate how the changes in business environment shifted the way of running business nowadays. The obsolete blockbuster model is not efficient any more – smaller specialized pharmaceutical companies are becoming more competitive at the market.

The following chapter presents the analysis of business models in the pharmaceutical industry based on the several in-depth interviews with pharmaceutical companies in the Skåne region in Sweden. The business models of these companies are conceptualized on the basis of Oswerwalder's (2004) business model and Osterwalder and Pigneur (2009) business model canvas concept, and compared with theoretical business models constructed in this chapter.

4. Methodology

The following chapter presents the methods used for the empirical research. In-depth interview approach is described and discussed in terms of its limitations and advantages for the following study.

Previous sections of the research presented a theoretical analysis of the business model concept in the context of general changes in the business environment and, in particular, in the pharmaceutical industry. The two business models representing the pharmaceutical industry were constructed according to the theoretical framework presented in Chapter 2. The aim of the further empirical research is to give a deeper insight into the business models in the pharmaceutical industry on the example of the two pharmaceutical companies in Skåne region, Sweden. In-depth interview studies of the two pharmaceutical companies were held for the purpose of the following empirical research. On the basis of the obtained data the business models of these companies were constructed and compared with the theoretical blockbuster model presented in the previous chapter.

The choice of in-depth interviewing for the empirical research was guided by the data specification needed for the business model construction. Since business modeling requires detailed and profound information about the company, in-depth interviewing is the only method capable to provide it. The major limitation of all other data collection methods in comparison with in-depth interview, is that they are structured (e.g. surveys), which makes it possible to obtained only narrowly specified set of information. In contrast, in-depth interviews enable to explore compound problems and to receive additional information and clarifications about the researched issue (Berg, 2009; Denzin & Lincoln, 2000).

Under the ideal circumstances, three pharmaceutical companies: two pharmaceutical companies with the similar profile (size, age, location) and one blockbuster company would have been interviewed. Data for the business model construction on the two pharmaceutical companies (Camurus AB and QPharma) is easy to compare and, besides, similarity in companies' profiles

allow to point out distinctive features between their business models. The interview with the blockbuster company would have helped to get a deeper insight into the company's business model, as its theoretical projection is used for the analysis. At least three one-to-one personalized interviews should have been conducted with companies' CEOs: general introductory interview, more specific interview and final interview aimed at details' clarification.

Under the given circumstances two pharmaceutical companies - Camurus AB (Lund, Sweden) and QPharma (Malmö, Sweden) - were interviewed. The selection of the companies was made on the basis of their availability and willingness to participate in the in-depth interviews. Hence, the common feature of the companies is location (Skåne, Sweden: Lund and Malmö). This factor cannot be considered as limitation, since it hasn't influenced the results of the research – it only gave a slightly different direction for the empirical analysis in terms of its structure. Due to the time restrictions, the data collection was held in three stages for each company: available information research (instead of the first general interview); one 1-hour specific in-depth interview with the company's CEO; e-mailing for the details clarification (instead of the final interview).

In addition, one in-depth interview with the Business Development Manager of the Swedish investment agency responsible for supporting the life science companies in Skåne region ("Invest in Skåne") was held for the purpose of data collection on the general patterns of the pharmaceutical industry in the region. "Invest in Skåne" is a Swedish part of Medicon Valley - one of the most famous life science clusters situated in the eastern Denmark and south-western Sweden.

For the purpose of coherency and validity of the results, the all interviewees were presented in the theoretical framework of the business model canvas by Osterwalder and Pigneur (2009) used for business model construction. The guidance for the interviews contained three groups of guiding questions. The first group contained several general questions - interviewees were asked about their view of the pharmaceutical industry:

"Which major trends and challenges do you see in pharmaceutical industry today?"; "What are the major shifts of the pharmaceutical industry happened during the last 15-20 years?"; "How can you describe your business model?"; etc.

Second group contained guiding questions about company's business model. The all questions were aimed at obtaining maximum information about each block of the company's business model:

"How can you describe your value proposition?"; "What are the core competences necessary to execute your business model?"; "How does your company generate revenue?"; etc.

The general evaluation questions were presented to the interviewees in the last group:

"How can you evaluate your business model?"; "What are the major challenges for your business model?"; "How can you overcome them?"; "What is your strategy for the future growth?"; etc.

The data recording was made by a voice recorder and the interviewer's notes. All the recorded interviews were further transformed into the typed transcript.

The data analyses was organized in a few steps. First, the all information was divided in different categories: general questions, specific questions and personal questions (which highlight interviewees' point of view). Specific information on the companies' business models was projected on the theoretical framework: the data collected from the companies was analyzed and structured according to the business model concept by Osterwalder and Pigneur (2004). As a result, two business models were constructed and compared with the theoretical model presented in the previous chapter.

On the basis of the experience gained during the empirical study mentioned above, few considerations should be bared in mind for the further research. First, general one-to-one

interview might be important in terms of information and reflections of the interviewees. This first flow of information can give unexpected turn for the further discussion and to give new ideas for the researcher. Second, the final personalized interview might be important in terms of detailed discussion and clarification of the already by researcher analyzed issues. To conclude, in case of in-depth interviews personalized meetings are more valuable than other ways of communication in terms of data collection.

The major limitation of the following empirical research is lack of standardization. Since the in-depth interviewing strategy covers only few companies, it cannot be generalized on the whole pharmaceutical industry in the region. Therefore this empirical study doesn't attempt to make any generalizations on the basis of its findings.

The following empirical research with in-depth interviews gives a deep insight into the complex issue of the shift in business models in the pharmaceutical industry and is a solid basis for the further research in this sphere.

5. Empirical data

The following chapter presents the descriptive data analysis collected during the empirical research. First, the pharmaceutical industry in the Skåne region is presented based on the interview with Life Science Business Development Manager of "Invest in Skåne". Second, the pharmaceutical companies Camurus AB and QPharma are introduced and discussed.

5.1. The pharmaceutical industry in Skåne

Skåne region in Sweden is a part of the biggest life science clusters in Europe called Medicon Valley. Established in mid-90's, Medicon Valley covers the Öresund region where life science has been developing and growing as an industry for a long time. Though the population of the Öresund region is only 3,5 million people in total, collaboration inside the cluster comprises around 450 companies mainly focused on R&D, universities and hospitals. The Swedish part of Medicon Valley - Invest in Skåne - is a state agency responsible for attraction of investments to the region (Medicon Valley, 2011).

The life science industry in the region includes pharmaceutical, biotechnological and medtech industries (Invest in Skåne, 2011). According to Life Science Business Development Manager Anna Cherouvrier Hansson, the majority of the life science companies in Skåne region, in contrast with Denmark, are small companies – often incubating companies - with innovative products. A big proportion of the companies is still in developing phase without any products at the market. IDEON science village in Lund is a contributing factor for the growth of small companies.

Skåne region has a great potential for the development of the pharmaceutical industry. There are several big pharmaceutical companies (McNeil AB in Hesingborg, QPharma in Malmö, Astra Zeneca (now it moved to Denmark, but it influenced the development of the region a lot), Recipharm AB in Jordbro etc) and many small biotech companies which provide projects - mainly R&D - for the big pharma. As Anna Cherouvrier Hansson mentions:

"It's a general trend – concentrating on the main areas and outsourcing R&D to smaller companies. For these smaller companies the main issue is to find a big pharmaceutical company as a partner. For example, the contract between Swedish research-based pharmaceutical companies developing innovative antibody drugs BioInvent AB and biotech company Genetech in the USA is based on Genetech's investments in BioInvent's antibodies development (it's on the phase II). In return, Genetech will receive the rights to launch the product in the USA."

The main shift in the pharmaceutical industry during the last 10-15 years is risk aversion. The big pharmaceutical companies are willing to produce new blockbusters (which are antibodies and biological compounds), but at the same time they want to reduce the risk. Therefore, big companies invest in smaller biotech companies. Making an agreement on what results should be achieved at each stage of development, the big pharmaceutical companies can break the collaboration if expected results are not met. The risk and losses in such case are lower than in case of the whole unit's closure inside the company. As CEO of Camurus AB Fredrik Tiberg denotes:

"For example, after seven years of development process you want to start selling something within the diabetes. You build up the structure and when it comes to registration – you are refused. It's a slow process of development with very abrupt failures. The challenge is to create a buffer which gives you consistency. If a small company fails with only one product which they have – the company is gone. For the big companies it can be USD 20 billions' loss in one night – a very rapid change in a very slowly developing industry.

Before, companies were very risk taken. Now companies are shifting to the option deals (license, acquire) when there is a smaller amount of cash which is driving you to the next step (risk aversion). For small companies – earlier the option field was bigger, now it's smaller and payments don't come until the level of risk is minimized."

Two companies chosen for this research present their perspective on the way they conduct business in the pharmaceutical industry in Skåne region. Table 5.1 presents main characteristics of the companies which participated in the following case study.

Characteristic	**Camurus AB**	**QPharma**
Location	Lund, Sweden	Malmö, Sweden
Year of establishment	1991	1999 on the basis of Ferring
Size (number of employees)	27 (+ contractors)	115
Type of the company	Drug delivery company	Contract manufacturing company
Key activities	Drug-delivery technologies; R&D: 5 in-house projects (preclinical phase – ready projects), 2 out-licensed projects, range of partner projects	Contract drug manufacturing; contract drug development; analytical services
Interviewed person	CEO	CEO

Table 5.1. Main characteristics of the pharmaceutical companies (Camurus AB, 2011; QPharma, 2011)

5.2. Camurus AB

Camurus AB is a drug delivery company. Situated in Ideon Science Village in Lund, it specializes in drug delivery technologies (oral nanoparticles, injection depot, injection nanoparticles, topical bioadhesive and transdermal nanoparticles). Beside of the drug delivery technologies, the company has several in-house R&D projects, out-licensed projects and partner projects, as it shown in the Table 5.2.

Activity	**Name of the product**	Phase of development	In-house/out-licensed/partner project
Drug-delivery technologies	FluidCrystal® NP Oral nanoparticles	Registered	In-house
	FluidCrystal® Injection depot		
	FluidCrystal® NP Injection nanoparticles		
	FluidCrystal® Topical bioadhesive;		
	FluidCrystal® NP Transdermal nanoparticles		
R&D	CAM 2036 (diabetes part II)	Preclinical	
	CAM 2038 (drug addiction, pain)	Phase I	
	CAM 2029 (acromegaly, cancer)	Phase II	
	CAM 2032 (prostate cancer)		
	Episil - CAM 2028 (oral mucositis),	Registered	
	Elyzol dental gel (Parodontitis)		Out-licensed
	Salinum® Xerostomia (dry mouth)		
	Undisclosed products, oncology, anesthesia, metabolic disease, pain (multiple partners)	Preclinical	Partner

Table 5.2. Value proposition structure at Camurus AB.(Camurus AB, 2011)

CEO of the company described the business model of Camurus AB as following:

"We are looking for the new customer's needs in terms of therapeutic functionality (modality) to develop and exit at phase II or III or even take it through all the way to registration and then

exit. Development to the certain suitable exit point depends on how much investments do we have to make up to phase II or III, or till registration.

Identification of our customers' needs is a dual process. From one side, we have our certain functional spectrum of technology. From the other side, we have certain medical needs at the market (identified though literature research, reference competence groups, in-house knowledge). Our task is to meet customers' needs with our functional spectrum of technology."

The strategy of Camurus AB is based on delivering those value propositions to the customers, which are relevant to a company's available resources. As it is shown in the Table 5.2, the range of company's offerings is quite large – from preclinical research in anti-diabetes medicines (which is considered to be a niche market) to registered dental gel against paradontitis (which goes to mass market). As the CEO denoted:

"We do not have a strategic preference on niche products, though there are some advantages of niche markets: smaller scope, fewer products, fewer players. But for niche products you can do very limited clinical trials. If to go into niche market – the company would never take a product longer than phase II. We don't exclude the possibility to go there – if we see that technology and capacities can fulfill large medical need, we'll go there."

An important part of the company's business model is the drug-delivery technologies. Aimed at "better treatment outcomes while improving convenience, compliance and quality of life", drug-delivery technologies produced by Camurus provide support for the drug production (Camurus AB, 2011). The pharmaceutical companies producing medicines that have some limitations or inconveniences in use by patients are the main consumers of the Camurus's drug-delivery technologies.

5.3. QPharma

QPharma started its history in 1975 when pharmaceutical company Ferrosan constructed a plant in Malmö. Almost 10 years later Ferrosan and Leo merged and were acquired by Pharmacia which was interested in getting more production capacities in Skåne in 1986. In 1995 Ferring

acquired the plant from Pharmacia (now Pfizer). QPharma was formed in 1999 as a contract manufacturing company and in 2000 was acquired by Nordic Group BV. QPharma is still producing some of the Pfizer's and Ferring's products by contract (QPharma, 2011).

Nowadays QPharma focuses not only on contract manufacturing but on contract development and analytical services. Contract manufacturing includes manufacturing of a range of solid dosage products and polymeric controlled-release delivery systems; as well as customized packaging and source high-quality packaging materials that comply with all regulatory requirements (QPharma, 2011). QPharma is experienced in different kinds of technology transfers, which broadens the spectrum of possible ways of cooperation with the company. Contract development in QPharma covers contract R&D projects starting from preclinical research to commercialization. Analytical service includes lab testing, project management etc.

CEO of QPharma Kenneth Stokholm give the following description of a company's business model:

"Our business model is similar to many contract manufacturers. It doesn't contain any basic research, we don't do anything for ourselves – there are always customers with contracts working with us. If we are given a development task, we are paid for it. We don't have a major risk of investing money in a product which will not succeed. If the product is not successful on the further preclinical or clinical trials QPharma is still paid for their part of the development work. The customer takes the all risks. If the trial is successful – it moves to commercial production – we are given the opportunity to produce for the customer as well. In that respect – we have a lower margin on our products but also a low risk The challenge lies in selecting the development projects that are most likely to succeed in clinical trials and proceed to commercial production.

We are successful in what we do. Due to the growing development part we have 10 projects today in comparison with 1 project 5 years ago. That means that the growth of revenue from 5% 5 years ago to 30% now. Some of the projects are moving into the commercial production – the model is working very well. In comparison with those contract manufacturing pharmaceutical

companies which chose to focus on manufacturing without development, this model is working better."

The basic products which QPharma produces are silicon based products which is the company's competitive advantage, since very few pharmaceutical companies specialize on that delivery system. The company's strategy of focusing on specialized production and "contract" services allows it to mitigate risks and to keep competitiveness at the market.

Business models of both companies are constructed on the basis of Oswerwalder's (2004) business model and Osterwalder and Pigneur (2009) business model canvas concept and analyzed in the further section.

6. Results and analysis

The following chapter presents the empirical analyses of the data collected from the two pharmaceutical companies. The business models of Camurus AB and QPharma are constructed on the basis of the business model theoretical framework by Oswerwalder's (2004) business model. Further on, business models of the companies above are compared with the theoretical blockbuster business model constructed and presented in Chapter 3.

The data collected during the in-depth interviews with Camurus AB and QPharma are analyzed according to the business model concept by Osterwald and Pigneur (2004) presented in Chapter 2. The four pillars of the business model - Value Proposition, Customer Interface, Infrastructure Management Interface and Finance – contain information about the companies and are further decomposed into business model's blocks. Each block is analyzed according to the all parameters discussed in the section 2.2 of the Chapter 2.

Figures 6.1 and 6.2 present synthesized business models of Camurus AB and QPharma. Reflecting these projections on the definition of the business model presented in Chapter 2, Figures 3.2-3.3 and 6.1-6.2 present the way how ***companies convert their inputs (technological characteristics and potentials built on key activities, key resources and key partners) into economic outputs by means of value proposition (product or service offering) creation and delivery through target customer segments, customer relations and markets as a distribution channel.***

Both companies are using alternative to the blockbuster business model – Camurus is a small pharmaceutical company with focus on R&D, while QPharma is a middle-sized contract development and manufacturing company. Being similar in some general patterns like participation in networks, customer relations and distribution channels, both companies have their specific distinctive features.

To start with, the business models of both companies have core differences in their **offerings and value proposition** in general. Value proposition of Camurus AB consist of two major

offerings: drug delivery technologies and R&D on different phases in the pipeline. The drug delivery technologies are developed in-house and deliver value to the customer through technical superiority in comparison with competitive offerings.

The drug delivery technology offering creates value to the customer through its use and efforts reduction – these technologies are used in combination with other drugs' ingredients for creation of the safer and more convenient-in-use medicines. The value level of the offering is created through innovation; offering's price level is built on the basis of the market price.

Both companies have an R&D offering. The main difference between these offerings lies in the way the companies identify and create them. Camurus AB is either independently trying to identify customers' needs and to start a R&D process till the certain exit point (depending on investments), or is working on partner projects. Camurus AB doesn't focus on any specific group of products for the creation of the new offerings – a combination of customers' needs and available technology determines the offering. In contrast, QPharma's offering is directly dependent on the contract with the customer – the value is delivered through R&D progress delivery at a certain development phase. QPharma doesn't have any in-house R&D projects, the all projects are "ordered" by other companies. In both cases value of the R&D offering is created through the use of the proposition (further development or commercialization) and at the market price. Value is delivered differently: in case of Camurus AB – through innovation; in case of QPharma – either through innovation, or through innovative imitation, or though me-too projects (depending on the contract).

Apart from the R&D offering, QPharma's value proposition comprises 2 more offerings: contract manufacturing offering and analytical service. Firstly, contract manufacturing offering creates value through reduction in efforts – value for the customer is created at the moment when the contract company signs an agreement with QPharma about the outsourcing of drug production. Secondly, value is created through the use of the offering - older products have lower production cost, because of the continuous improvement of the production process, which leads to the lower price for the customer.

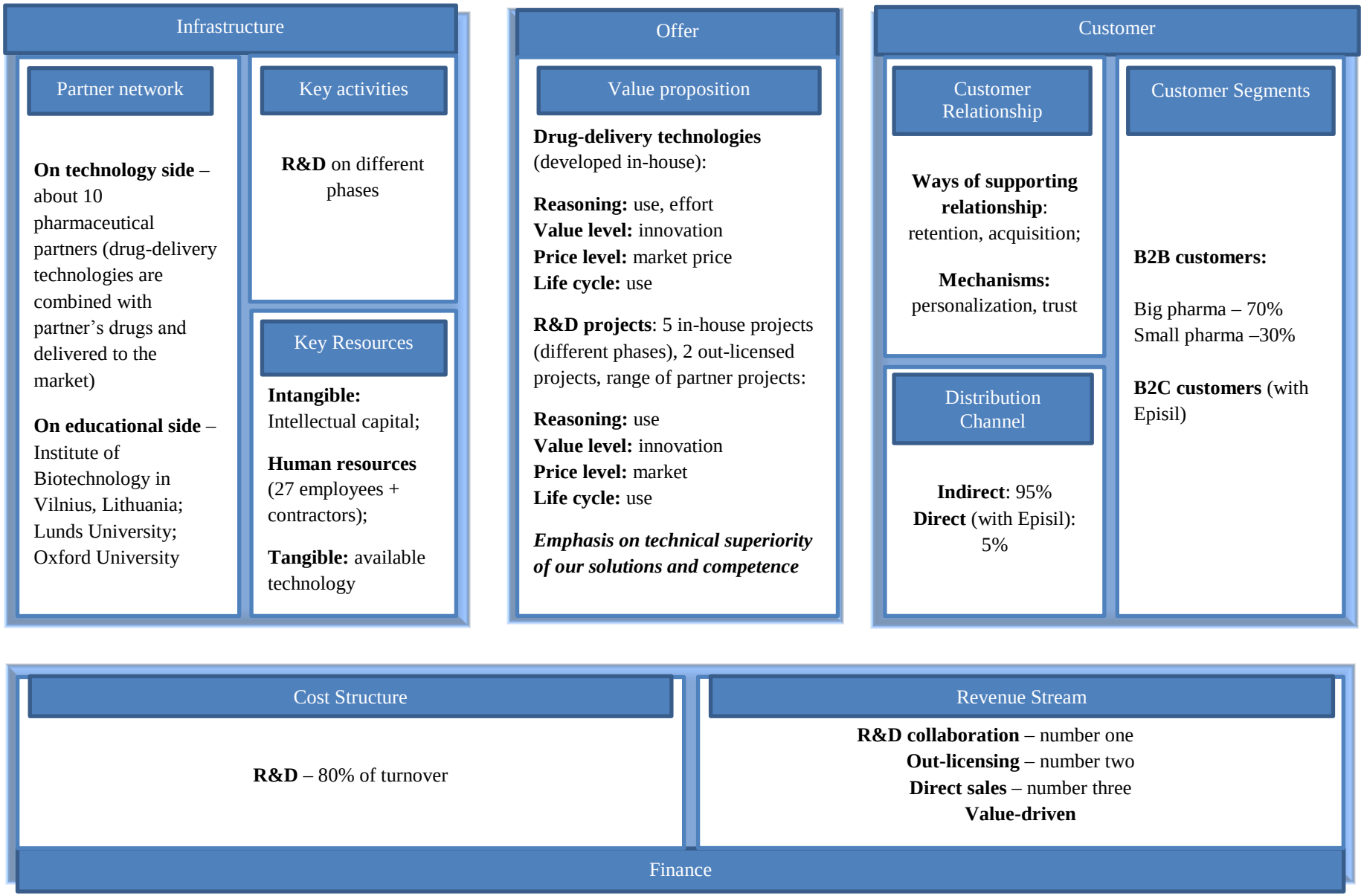


Figure 5.1. Camurus AB business model (conceptualized on the basis of business model concept by Osterwalder (2004) and business model canvas by Osterwalder and Pigneur (2009)

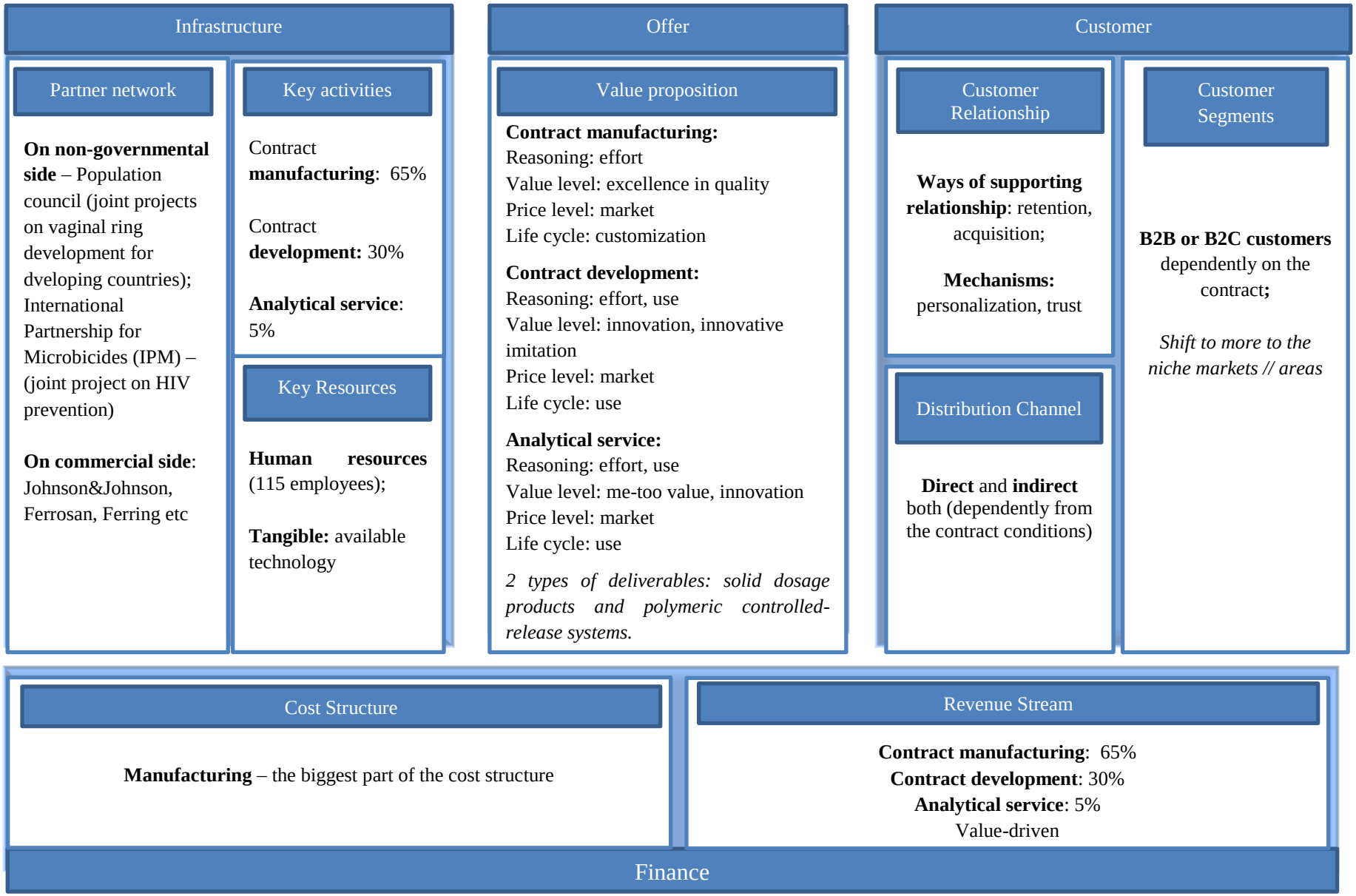


Figure 5.2. QPharma business model (conceptualized on the basis of business model concept by Osterwalder (2004) and business model canvas by Osterwalder and Pigneur (2009)

In addition, new products deliver value in terms of delivery systems (convenience of use for the customer) – the same medical need but has more convenient solution for the patient, better side effect profile, lower dose of medicine. In case of manufacturing value is delivered to the customer though excellence of execution at a market price. In case of analytical services value is created either through me-too services (use of standardized techniques) or through innovation (innovative analytical testing) at a market price.

Both companies have a clearly defined value proposition which is diversified into several offerings. Comparing with the blockbuster model (Figure 3.2), QPharma and Camurus reduced their risk and level of uncertainty through a diversified value proposition and focus on a certain part of pipeline.

Customer interface pillar of the companies' business models have more similarities than differences. The main difference is that QPharma is trying to shift to the niche markets, and Camurus AB don't have any preferences concerning the niche or mass market. Both companies aim their value proposition at the B2B segment of customers. In case of QPharma – B2B customers comprise other pharmaceutical companies working with QPharma on contract conditions. If the contract assumes that QPharma is taking the product through the all pipeline to commercialization, QPharma will deliver the value proposition to B2C segment of customers – directly to the drugs' customers at the market. In case of Camurus AB – 95% of the targeted customers are B2B customers (of which 70% - Big Pharma and 30% - Small Pharma) and 5% - B2C customers (consumers of Episil). Respectively, both companies are using indirect distribution channels to the larger extend than direct. Another similarity is that both companies use mainly retention for supporting relations with their customers and, to the smaller extend, - acquisition. The main mechanisms used by the companies are personalization and trust. Acquisition of the new customers is done through personal meetings of potential customers at the different conferences and is based on personalized contacts.

Comparing the customer interface pillar of the blockbuster business model with alternative business models above it is necessary to point out the major differences between them. First,

blockbuster model doesn't have clearly formed customer segment (it is very vast), whereas QPharma and Camurus AB can configure the major group of their customer and focus on their retention. Second, as a consequence of the previous argument, blockbuster companies have to spend huge costs on marketing of their production. Camurus AB and QPharma promote their value proposition through personalized contacts, which is impossible in case of the blockbuster model.

The infrastructure management pillar in both models is built on the core capacities of the companie. The key resources of Camurus AB are intangible (intellectual capital: out-licensing), tangible (available technological capacities) and human (27 employees plus constructors for consultancy, organization for preclinical testing etc). A combination of key resources with customers' need determine the company's value proposition at the market. Talking in Wallin's (2000) terms, Camurus AB possesses generative capabilities, e.g. innovation and customer-interaction capabilities. The value configuration of Camurus AB consists mainly of R&D on different phases.

As for the QPharma, tangible (available technology, plants) and human resources are core for the value proposition delivery. From Wallin's (2000) perspective, the core capabilities of QPharma are generative (more execution and less – innovation) and customer interaction capabilities. Correspondingly, key activities of the company are: contract manufacturing (65%) contract development (30%) and analytical service (5%). According to the QPharma's CEO, new manufacturing unit will be constructed next year – the company is investing in enlargement of the core capabilities block.

In contrast to QPharma and Camurus AB, who make an emphasize on their key resources utilization and building competitive advantage on the basis of it, the blockbuster business model keeps the whole production pipeline in-house. QPharma and Camurus AB are exactly those kind of companies which blockbuster company should cooperate with. Through R&D or drug manufacturing outsourcing to smaller companies like Camurus AB or QPharma, the blockbuster

company will mitigate the risks of drug development failure and decrease the costs for non-core company activities.

The last block of the infrastructure management pillar is partnership networks. Both companies are participating in business, non-governmental or educational networks with the same incentives: a partnership for customer acquisition and knowledge sharing. From the commercial side, QPharma cooperates with companies primarily from Europe and the USA (Pfizer, Ferring, Johnson&Johnson, etc). This is a partnership for customer acquisition and risk mitigation. Besides that, QPharma cooperates with non-governmental institutions for the purpose of the development of accessible medicines for developing countries: with the Population Council on development of contraception vaginal ring and with the International Partnership for Microbicides (IPM) on development of medicines against HIV. Such kind of partnership can be classified as a partnership for knowledge sharing according to the theoretical framework used for the purpose of this research.

Camurus AB has around ten partners at the technology side. Besides that, Camurus AB participates in networks with educational institutions – the Institute of Biotechnology in Vilnius, Lithuania; Lunds University in Sweden; Oxford University in England. These are a partnerships for customer acquisition and partnerships to acquire knowledge respectively.

One of the sharpest differences between the blockbuster business model and alternative ones lies in the partnership block. In contrast to the partnership blocks described above, the blockbuster companies doesn't participate in any partnership networks.

Concerning **financial aspects**, QPharma and Camurus AB have a similar structure of cost and revenue stream blocks. The biggest part of the cost structure at QPharma is manufacturing and at Camurus AB – R&D. Naturally, companies invest the most in their core capabilities. In comparison, the cost structure of the blockbuster pharmaceutical company is much more complicated because it has to invest not only in core activities, but also in maintenance of the whole in-house development processes.

Revenue streams at QPharma and Camurus AB are divided respectively to the value proposition's offerings. The biggest revenue sources for Camurus AB are, respectively, R&D collaboration, out-licensing and direct sales. Therefore, two revenue stream types can be distinguished: selling (R&D and direct sales) and out-licensing. For the R&D and out-licensing differential pricing is used (product feature dependent and value based) and for the direct sales – a market pricing mechanism is used. The revenue streams at QPharma are divided 65%/30%/5% between contract manufacturing, contract development and analytical services. The stream type is selling – all the above services and activities are sold to the customer. The pricing mechanism used is differential pricing.

The blockbuster model has revenue streams from the high volumes of blockbuster drug sales and, sometimes, from licensing. The main challenge for the blockbuster company is that the blockbuster drug will not get to the final stage of development and will not be launched. That will mean huge losses for the company. Comparing to the blockbuster business model, QPharma and Camurus AB have more stable revenue streams which are less risk sensitive.

Both companies are value driven. QPharma presents its competitive advantage as a combination of reliable supply, delivery in time, high quality and unique capacities of combining silicon production. Camurus AB positions itself also as a company which is aimed at quality delivery more than at the cost reduction. The blockbuster pharmaceutical companies try to be both – value- and cost-driven. From the one side, it should deliver high quality with the blockbuster drug, but from the other side – affordable for the wide spectrum of customers.

As it was illustrated in the Chapter above, alternative business models emerging at the pharmaceutical industry today are much more flexible and adapted to the market changes and shifts than the blockbuster business model.

7. Conclusions and discussion

The following chapter holds a discussion on the findings of the research presented in the paper. A short analytical summary about the business model concept used for the research is made. Furthermore, the possibilities of further research, as well as practical implications of this study are developed and reflected on.

7.1. Summary of the findings

The study presented above sheds light on the major shifts in the business models in the pharmaceutical industry. The combination of the theoretical approach with in-depth interviewing allowed to describe the issue of the business model's shift in details and to compare theoretically constructed models with the business models constructed for the real companies.

The defragmented business model in Chapter 3 projected the theoretical conceptualization of the new alternative business model in the pharmaceutical industry. In relation to further research, it is also reflecting expected findings of the empirical study. The results of the empirical analysis reported in Chapter 6 supports the results of theoretical analysis presented in Chapter 3 and illustrate the major changes in the business model in the pharmaceutical industry in relation to its theoretical conceptualization. Thus, the answer to the researched questions ***"What is the old business model in pharmaceutical industry?", "What is the new business model in pharmaceutical industry?", "What are the major difference between old blockbuster business model and new alternative model?"*** are illustrated in Table 7.1.

Table 7.1 presents a summary of expected empirical results (which are embodied in the theoretically constructed disintegrated model) in comparison with real findings from the in-depth interviews with two pharmaceutical companies. A parallel comparison with the old blockbuster model gives a summary of the major shifts in business models in the pharmaceutical industry.

No	**Business model element**	**Expected results:** *Theoretically constructed* ***new defragmented business model***	**Actual findings:** ***Real business models*** *of two pharmaceutical companies*	**Comparison:** *Theoretically constructed* ***old blockbuster business model***
1.	Value proposition	Based on the particular part of the drug development pipeline (*R&D; drug development on the phases 1-2; drug manufacturing etc*); including satellite services into the real product proposition	Based on the certain part of pipeline; diversification of the value proposition into several products/services	Blockbuster drug
2.	Target customer (customer segment)	Niche markets or specification on certain area (e.g. cardio-vascular diseases)	Niche market or clearly formed customer segment based on emerging customer needs	Mass markets – wide range of customers
3.	Customer relationship	More personalized relations with customers	Personalized contacts	Mass marketing of the blockbuster drug; no personal contacts with the customers
4.	Distribution channel	Direct/indirect – depending on the value proposition	Direct/indirect– depending on the value proposition	Direct, since the only value proposition is a blockbuster drug
5.	Key activities	Based on core capabilities; investments saved on promotion into the key activities and core capabilities	Based on core capabilities utilization; investments into core capabilities	All-in-house production; no emphasis on the key activities
6.	Key resources	Focus on its core capabilities, e.g. capabilities on which this company can build competitive advantage; outsourcing of those capabilities which are not core and insourcing of those capabilities which are needed for value proposition delivery	Focus on its core capabilities	All-in-house resources; no division in core and not-core capabilities

7.	Partnership network	Risks and uncertainty reduction through participation in the networks	Participation in the business, knowledge networks; networking for risk reduction	No participation in any partnership networks.
8.	Cost structure	Related to its core capabilities utilization	Related to its core capabilities utilization	Related to the whole in-house development processes
9.	Revenue stream	Based on the core activities and kind of value proposition	Divided respectively to the value proposition's offerings.	Based on the high volumes of blockbuster drug sales and, sometimes, from licensing

Table 7.1. Comparison between empirically built business model, theoretical disintegrated and blockbuster business models.

As it is illustrated in the Table 7.1, the theoretical conceptualization of the alternative business model, i.e. the new defragmented business model, is congruent with the business models constructed on the basis of empirical research. Though the empirical research cannot be generalized on the whole region, because of the in-depth interviews' limitation, it gives a deeper insight into their analysis. The results reported here confirm the value of the business model concept and, therefore, that the conceptualization of the alternative defragmented business model is coherent with the pharmaceutical companies which participated in the research.

Analyzing the differences between old and new business models in the pharmaceutical industry, the ***major shifts in the business models*** can be summarized. The most fundamental shift is the change from the obsolete blockbuster business model aimed at the all-in-house pipeline production of the single blockbuster drug for the mass market to the alternative defragmented business model which specifies on the certain part of the production pipeline and targets its offers at the niche markets. To summarize, on the basis of this study the main shifts in the business models in the pharmaceutical industry can be generalized as follows:

- From large scale to narrow focus;
- From mass market to niche market;
- From mass marketing to personalized customer relations;
- From all-in-house to outsourcing;
- From profit-alone to profit together;

- From high risks to risk mitigation.

Since the present study is built around the business model concept, the weaknesses and strength of the selected approach by Osterwalder and Pigneur (2004) are discussed in the following sub section.

7.2. The business model concept

For the purpose of this study the business model framework developed by Osterwalder and Pigneur (2004) was used. Since the model concept above pursues the goal to describe business models in general - independently from the industry or sector - it may need some adjustments according to the researched area.

A strong point of the model is its coherency and details-orientation. A clear decomposition into four interrelated pillars allows to draw a full picture of how the company functions. Further deconstruction into smaller blocks which, in turn, consist of a range of precise and detailed elements, is a useful tool for the deep understanding of the company's business structure. The model is easy to follow and to understand because of the consistent explanation of each sub-element made by the authors.

As a consequence of specificity of the researched area, i.e. the pharmaceutical industry, some elements of the business mode can be adjusted for the improvements in the further research on this paper. For example, some attributes of the value proposition block can be modified according to the pharmaceutical industry, e.g. reasoning. The types of reasoning attribute suggested by Osterwalder (2004) include use, risk and effort. Since pharmaceutical companies often produce non-tangible goods, it makes it difficult to explain whether these goods are valuable to the customer because of their use, risk reduction or effort reduction. The possible modification in classification can be made by including such characteristics as "research and development" – if the company focus on R&D offers and "production" – if the company specifies on the drug manufacturing. The attributes "risk reduction" and "effort reduction" can be

eliminated, since the all pharmaceutical activities are aimed at the risk and effort reduction (to create safer medicines and to make the process of taking medicines easier for the patients).

To conclude, the business model concept used in the study is a good tool for the description of the company's business model, but it may be adjusted with small specifications according to the area it is applied to.

7.3. Further research and practical implications

This study both corroborates previous research in business models' shifts and could be the starting point for future research in the pharmaceutical industry. Though the research presents a number of limitations that make it difficult to generalize from these findings, it offer new insights and supports previous findings about the shift in the business models.

A practical implication of this study is that it can be used by pharmaceutical companies as a guideline for business modeling. The theoretical framework of this study can be used as a manual for the company willing to construct its business model. Besides, the hints about the major shifts in the business models in the pharmaceutical industry gives companies a possibility to evaluate their business models in comparison with theoretically constructed models.

For the purpose of the further research it may be interesting to make a survey among all the pharmaceutical companies in the Skåne region. The survey should be based on the business model concept described in this study and adjusted specifically to the pharmaceutical industry. Data on the business models of the pharmaceutical companies in the whole region will allow making more aggregated conclusions and proving theoretical models presented in this research.

Conclusions made on the survey basis in addition to this study will illustrate the whole picture of the pharmaceutical industry in the region, which will make it possible to analyze existing trends more carefully and to implement some corrections into the policy towards pharmaceutical industry development. Besides, the survey analysis will help companies to understand more

precisely what the competitive situation in the region is and what the possible areas for improvements in their business models are.

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