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Business Model Patterns Used as a Tool for Creating (new) Innovative Business Models

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Abstract

Purpose: As companies need to be able to identify whether their business model is under threat and also to make the right decisions concerning the development of a potential new business model, we have adopted Porter`s five forces in order to analyze different threats to a business model. Furthermore, we have evaluated different business model patterns and rated them according to their impact on each of Porter's forces. By being aware of patterns, managers and decision makers can generate a new business model or adapt an existing one in a more systematic way.

Design: Data were gathered through surveys. Data were analyzed by median analysis.

Findings: We were able to identify clear trends in the performance of patterns against Porter's forces. The results can furthermore help companies to make systematic combinations of these patterns to mitigate the threats. For the forces "bargaining power of buyers", "bargaining power of suppliers", and "competitive rivalry" we were able to identify specific value dimensions of the BM patterns.

Research limitations / Implictions: We have defined five steps for using business model patterns as a tool to counteract the pressure of any of Porter's five forces. Managers and decision makers can use these patterns to generate systematically a new business model or adapt an existing one.

Originality / Value: Scholars propose a pattern-based methodology in order to develop business models (Rudtsch et al., 2014). Therefore, the aim of this paper is to find out how companies are able to overcome business model threats by using business model patterns and linking these to the value dimensions of a business model

Introduction

Over the last few decades, both professional practice and academic research have provided substantial insights into how to master new product and service development successfully. However, recent technological advances and economic challenges necessitate that established companies not only increasingly reshape their products (or continuously improve their processes), but also innovate their business model (BM) (Chesbrough, 2010; Burmeister et al., 2015). Not only recent challenges, such as "industrial internet", but also more "traditional" threats, such as new suppliers or competitors (start-up scene), demand new business models. Therefore companies should not only be able to identify whether their business model is under threat, but also be able to make the right decisions concerning the development of a new business model. Where companies are failing to adapt their business models to changing environmental conditions is illustrated by, among other things, the example of the photography pioneer Kodak.

The identification and control of business (model) threats is one of the central issues in strategic management and to date not yet solved. Although in the past several approaches from the scientific field and professional practice to manage and control threats have been developed (Ansoff, 1975; Holopainen and Toivonen, 2012), companies today are often not able to recognize threats to their business model in time. The strategic management literature deals since its early days with the analysis of structures, strategies, and performance of companies in and between related industries. The "competitiveness" literature has considered internal factors and assumes that organizations define themselves within their environment because, for example, of their strategies (Porter, 1979), resources & capabilities (Wernerfelt, 1984; Teece et al., 1997; Eisenhardt and Martin, 2000), or core competencies (Prahalad and Hamel, 1990; Leonard-Barton, 1992; Barney, 1991) and that this is crucial for their performance. The contributions to weak signals (Ansoff, 1975, 1980; Rossel, 2011, 2012) and environmental dynamism (Bourgeois and Eisenhardt, 1988; Ginsberg, 1988; Tushman and Anderson, 1986; Saritas and Smith, 2011), in turn, put the focus on the far more complex external uncertainties and dynamics in the business environment which affect the company on a wide range. The concept of weak signals (a system developed by Ansoff) is one of these concepts and can be assigned to the strategic foresight literature. In particular, companies need to increase their sensitivity to fuzzy information (weak signals) in order to identify possible threats at a very early stage.

Thus, so-called weak signals are extremely difficult for companies to identify, and without adequate tools it is almost impossible (e.g. lack of expertise in the assessment of the development of unrelated industries). Overall, the literature on strategic management has a variety of approaches and concepts, but these are less suitable for industrial adoption or daily business.

Phenomena such as digitalization and increasing globalization have enabled the emergence of entirely new business models and changing market conditions, resulting in both significant opportunities for new business models and in threats to already existing business models (Amit and Zott, 2001). At the same time, it is being observed that firms respond differently to these threats: While some companies have increased their value significantly with new business models (e.g. Apple, Google, Facebook, Amazon, and Cewe), others did not respond or responded too late and have suffered significantly in value (e.g. Nokia, RIM, Microsoft, Yahoo, Kodak, Neckermann, and Karstadt / Quelle) (Chesbrough, 2010; Dewald and Bowen, 2010; Doz and Kosonen, 2008; Stötzer and Mahler 2013). When analyzing this phenomenon, the business model perspective is helpful: it combines existing approaches and enables a holistic view and an extensive and differentiated analysis that goes beyond the traditional boundaries of the enterprise (Amit and Zott, 2001; Bock et al., 2012).

But how can companies find out whether their business model is under threat and, if so, to which intensity? To the best of our knowledge, there is no existing approach in the literature which helps companies to identify business model threats. Therefore we adopt Porter's five forces in order to analyze different threats to the business model. Furthermore, also only little academic research has been published on dedicated methods and tools for business model innovation. One of the best known practitioner-oriented frameworks is the "business model canvas" of Osterwalder/Pigneur (2010), which fosters a creative workshop environment

analyzing as-is and defining to-be business models along a framework of nine elements (Burmeister et al., 2015). This and other canvas templates are also an important element of an iterative business model innovation process, as they can serve as easy prototypes to illustrate business models alternatives. Another dedicated tool is that of collections of business model patterns i.e., commonly used and proven configurations of specific business model components. The idea is that innovative business models can be created by rearranging and composing existing patterns. Gassmann et al. (2013), for example, propose a set of 55 business model patterns. Patterns can be used to enrich an existing business model with new elements (Rudtsch et al., 2014), as they help it to become more abstract and detached from existing (biasing) structures. By being aware of patterns, managers and decision makers may find it easier to generate a new business model or to adapt an existing one (Abdelkafi et al., 2013).

Scholars propose a pattern-based methodology in order to develop business models (Rudtsch et al., 2014). Therefore, the aim of this paper is to find out how companies are able to overcome business model threats by using business model patterns and linking these to the value dimensions of a business model. We used Porter's five forces as our underlying framework to analyze threats to business models. If it is possible to identify any trend in the performance of the value dimensions against Porter's forces, it will be possible to systematically generate business model innovations by combining different patterns.

The aim of this study is therefore to answer the following research questions:
- How can threats to businesses be overcome and opportunities detected in business models?
- How can business model patterns be combined in order to counteract Porter's five forces and to create successful business models?
- Which business model pattern is the most effective one in relation to Porter's five forces?

Background
Business Model Generation
There are various scientific peer-reviewed articles that Managers can generate business model innovations through three models: industry models, revenue models, and enterprise models. The first strategy – the industry model – innovates the industry value chain. This can be accomplished by moving horizontally from one industry to a new one or by reinventing an existing one. The revenue model strategy accomplishes business model innovation by introducing new pricing models or by reconfiguring the offers. Finally, in the enterprise model, a company's structure and the role it plays in the value chain are innovated (Abdelkafi et al., 2013).

Business model innovation is often created through a trial and error process and is rarely successful in the first approach. Due to fast-evolving markets and high uncertainty, it is difficult to predict the business environment during the development process. Additionally, environmental changes are often ambiguous. An enterprise's ability to adapt and predict is strongly affected by a manager´s judgment and interpretation skills, which are again influenced by existing organizational routines and behavioral norms and values. The owner-manager´s cognition and sense making are therefore the most important inputs for the initial business model design (Sosna et al., 2010). The challenges are to recognize threats on time and to relocate resources in order to address the concerns (McGrath, 2010). Experimentation is useful for overcoming the uncertainty in business model innovation. The experimental conditions, however, need to be representative of the larger market, and the experiments require a high investment. Direct costs are high, and there is always a risk that an experiment will not result in the expected outcomes and learnings (Chesbrough, 2010).

Value Dimension Framework and Business Model Pattern
One task of a business model is to provide an overview of how a company generates value in a profitable manner (Baden-Fuller and Morgan, 2010). Five value dimensions can be identified: value proposition, value creation, value communication, distribution channels, and value capture. The value proposition refers to the combination of products and services which are of interest for customers. Value creation is an irreversible process which gives a resource's 'order' greater usefulness to others (humans/organizations) (Beinhocker, 2007). Value communication ensures the delivery of the value proposition through a message. The dimen-

sion of distribution channels describes through which channels customers are reached and value delivered. Finally, value capture describes how the value proposition is transformed into revenue and captured as a profit (Abdelkafi et al., 2013). By improving these five value dimensions, a competitive business model can be developed.

About 90% of business model innovation is the result of re-combinations of already existing business models. Furthermore, these kinds of combination are repetitive, showing the existence of a pattern (Gassmann et al. 2013). Business model patterns can therefore be used to improve the five value dimensions of a business model. The patterns can be seen as business model building blocks which share similar characteristics or behaviors (Osterwalder and Pigneur, 2010). The combination of the patterns can lead to a systematic method for generating business model innovations (Abdelkafi et al., 2013). Business model patterns address particular characteristics and/or business relationships which can be evaluated and used as a pool of ideas (Rudtsch et al., 2014). Companies can make use of three ways to generate business model innovations with patterns: (1) Identifying successful business model patterns in the own industry and trying to adapt them to the context. (2) Adapting and transferring business model patterns from outside the industry. (3) Implementing business model patterns in the company or combining different business model patterns (Abdelkafi et al. 2013).

Gassmann created a business model pattern library consisting of 55 business model patterns. He furthermore defined four value dimensions which are equivalent to the above-mentioned five value dimensions. Gassmann's "what?" dimension refers to the product that is offered to the customer and is equivalent to the value proposition. His "how?" dimension is equivalent to the dimensions of value creation, value communication, and distribution channels. It describes how to build and distribute the value proposition. Finally, the dimension "why?" explains the viability of being profitable. This is equivalent to the value capture dimension proposed by Abdelkafi et al. (2013). The business model patterns can be assigned to these value dimensions. The combination of different patterns can lead to more radical innovations, since different value dimensions can be improved (Abdelkafi et al. 2013). Understanding

the underlying structure of the different patterns furthermore helps to minimize the cognitive effort in the development of innovative business models (Abdelkafi and Täuscher, 2014). Figure 1 gives an overview of the allocation of the business model patterns to the five value dimensions defined by Gassmann.

Failure of Business Models

The need to develop innovative business models is intensified by fierce competition among enterprises, the need to satisfy increasing customer requirements, and the rapidly changing environmental conditions (Beqiri, 2014). Yet despite their efforts, many companies will not survive in the long term. Business failure was defined by Honjo as "a situation in which firms cannot meet their liabilities and hence cannot conduct economy activities anymore" (Honjo, 2000). It furthermore does not only affect the interests of the stakeholders but also the general development of the economy and society (Wu, 2010). Nowadays, strong global players, such as AEG, Kodak, and Quelle, are vanishing from the business landscape. The question arises of why companies steer – despite their innovative capabilities – in the direction of failure. The answer is simple: the companies have failed to adapt their business model to the changing environmental conditions. Companies do not compete anymore between products and services but between business models (Gassmann et al. 2013). Therefore, if a company does not invest in developing or adapting its business model, the risk of failure increases. Reasons why managers fail to innovate their business models are, for example, a lack of experience and the ease of staying in a comfort zone (Gassmann et al., 2013). However, one of the main reasons is probably the fact that companies are not completely aware of what the aim of their business is. Very few managers are able to explain the business model of their company, although it is the basis for successful business model innovation (Gassmann et al., 2013).

According to Beqiri, the following points must be taken into account in order to avoid business failure (Beqiri, 2014):

- The business model must be revised periodically with a higher priority in comparison to product and services. Product and services can be easily replicated whereas the business model is typical of the way in which a company operates.
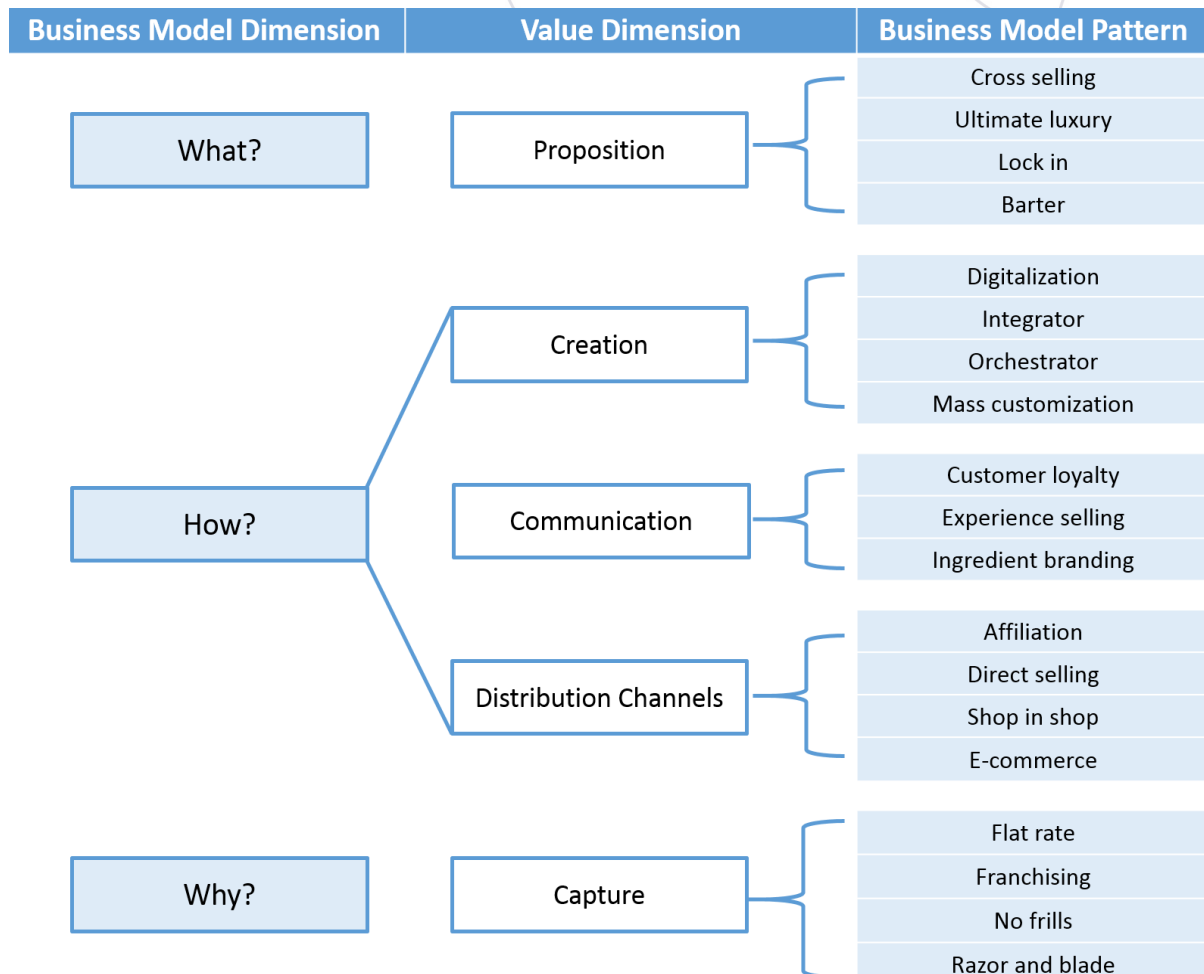
Business Model Dimension	Value Dimension	Business Model Pattern
What?	Proposition	Cross selling
		Ultimate luxury
		Lock in
		Barter
How?	Creation	Digitalization
		Integrator
		Orchestrator
		Mass customization
	Communication	Customer loyalty
		Experience selling
		Ingredient branding
	Distribution Channels	Affiliation
		Direct selling
		Shop in shop
		E-commerce
Why?	Capture	Flat rate
		Franchising
		No frills
		Razor and blade

Figure 1: Allocation of the Business Model Patterns (Gassmann et al., 2013)

- Companies must be ready to adapt their business model according to changes in the environment. A fast response to these changes is crucial.
- Customer needs are a priority in the operation of a company. Therefore, it is vital that before designing a business model, the enterprise knows its customers perfectly and involves them in the whole business cycle, from product design to customer service.
- Competition usually comes from existing players in the market, rather than from new entrants. In this way, it is important to learn from existing players who already have the experience, know the market, and are capable of recognizing more easily any changes in the environment.

Threats to Business Models – Porter's Five Forces

Porter's five forces describe the competitive forces within an industry and can help to analyze the strength of threats to a company. The identification of these threats – or at the same time of opportunities – can help organizations to develop appropriate strategies that maximize profit gains and ensure a long-term survival of a company (Shariatmadari et al., 2013, p. 886). Porter defined the following five factors: bargaining power of buyers, bargaining power of suppliers, competitive rivalry, threats of new entrants, and threats of substitutes. The stronger a factor is, the more the business models within this industry are at risk. Hence, the five forces can be used by companies as an early warning system to analyze the threats to business models within industrial sectors.

The force "bargaining power of buyers" describes the influence that consumers can have over the company. They can, for example, compel companies to lower their prices or to improve the quality or quantity of their products (Porter, 2008). This affects companies, since profit margins are reduced and competition among the market participants is increased. The consumers' influence is especially high for price-sensitive products (Porter, 2008, p. 30). How powerful the buyers are also depends on the amount of buyers who are interested in the product and how important a customer is for the company. Bargaining power of buyers is also increased when buyers purchase from the same supplier in larger quantities (Alrawashdeh, 2012). Big companies, e.g. Walmart, are able to negotiate prices and enforce lower prices from product suppliers. An essential part of the business model of those consumers is to buy large quantities at lower prices. This poses a threat to the suppliers. Buyers are furthermore especially powerful in industries where the production fixed costs are high and marginal costs are low or when the customers face low switching costs (Porter, 2008). The bargaining power of buyers can also be influenced by other factors, such as governments, patterns, and policies. These can act either in a positive or a negative way for the companies and also determine the success of a business.

On the other hand, also suppliers have a bargaining power over participants in an industry. They are able to set higher prices or limit the quality and quantity of the products offered (Porter, 1979). Powerful suppliers can therefore squeeze profitability out of an industry which is unable to pass on the increasing costs in its own prices (Porter, 1979). The bargaining power of suppliers is strongly influenced by their number. If there is only a small number of suppliers dominating the market, they are more powerful than if there were a lot of different suppliers (Porter, 2008, p. 29). If the product that a supplier offers is unique, or if a supplier has built up high switching costs, the supplier is also in a stronger position and poses a higher threat to companies (Porter, 1979).

Porter furthermore defined "competitive rivalry" as a factor which influences the competitive forces within an industry. It describes the rivalry among existing competitors and is present in many forms, e.g. new product introductions, advertising campaigns, service improvements, or price discounting (Porter, 2008). If a market is profitable, rivalry in the market will increase as firms are encouraged to participate (Lüttgens, 2015). The degree of rivalry within the market depends on many factors, such as the number of competitors, exit barriers, resources availability, capacities, and costs (Porter, 2008).

The fourth factor defined by Porter is the "threat of substitutes". A substitute is a product that can offer the same function or service in a similar way but by different means. One example would be microwave ovens as a substitute for conventional ovens. The threat of substitutes often shifts, as advances in technology create new substitutes or the price-performance comparison changes (Porter, 2008). Substitutes can limit the profits of economies and reduce the prosperity which an industry can have in good times. They can, however, also be positive if the company itself is able to develop or use an improved substitute. One example taken from the automobile industry was the development of new plastic materials which enabled the industry to reduce the utilization of metallic materials and consequently the reduction of the total weight of a vehicle (Porter, 2008).

The last factor of Porter's five forces is the "threat of new entrants". The success of industries is influenced by potential and existing competitors. New entrants aim to gain a market share, put pressure on costs and prices, and raise the investments needed to be able to compete (Porter, 2008). Companies can erect entry barriers that hinder companies from entering the market and hence mitigate the risk of new entrants. The most common entry barriers, besides physical and legal obstacles, are the scale and investment required to enter the market as an efficient competitor (Karagiannopoulos et al., 2005).

In this study we examine how business model patterns can be used in an effective way to mitigate the threat of competitive forces within an industry (Figure 2). To analyze the threats, Porter's five forces are used as a framework. We predict that the influence of business model patterns on Porter's five forces is the same regardless of the value dimension to which they belong.
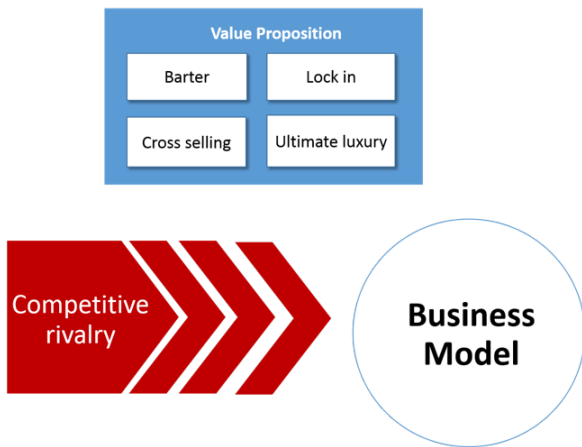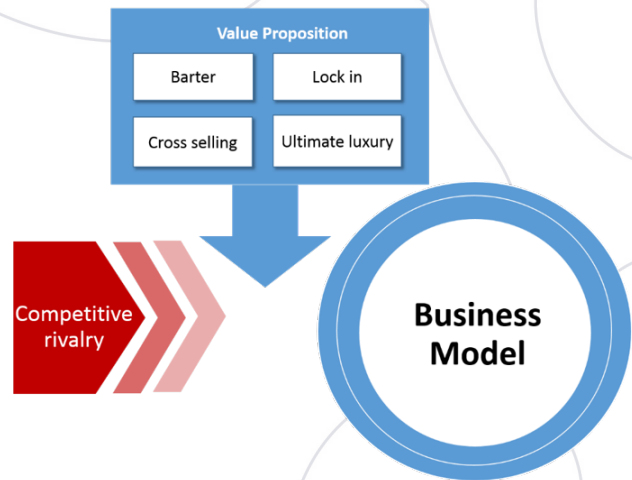
Figure 2: Mean values of the value dimensions against Porter's 5 forces

Method
Research Design
We conducted a systematic query via EBSCOhost using We conducted an exploratory research study, the aim of which was to answer the question of how business model patterns can be combined and used to reduce business model threats. Furthermore, which business model pattern is the most effective one to counteract which of Porter's five forces? We chose a quantitative survey, since it provides enough flexibility to reach the different experts in the field of business administration at lower costs. Experts from RWTH Aachen University were mainly chosen because that university's School of Business and Economics has an excellent reputation. The School has been accredited by the AACSB (Association to Advance Collegiate Schools of Business). For reasons of simplification, we grouped the business model patterns according to the 5 value dimensions and measured their effect against the different business model threats.

Population and Sample
As a unit of analysis we chose experts from the field of business administration (research associates, post docs and external partners from R&D projects of the TIM Group at RWTH Aachen University). This field was selected because the experts are familiar with the way in which a business works; they know how to manage resources, and their field of expertise is that of how to achieve stability, growth, and profitability in businesses. Furthermore, they are familiar with Porter's five forces.

The target sample size was 80 in order to have 4 respondents per business model pattern and to be able to analyze 4 different business model patterns per value dimension. This sample size was also chosen to increase the internal validity and to minimize the single information bias.

Measurement
To collect the data, a quantitative survey was set up. To establish internal validity, comparable groups were created randomly. Participants were assigned to these groups and answered one of the different surveys. By doing so, any biased strategy was eliminated and equivalent groups were created (Beins and McCarthy, 2012). Mood's median test was used to examine whether the medians from two or more populations were identical. The aim was to show whether a common behavior of the business model patterns within each value dimension exists.

Data Collection
The web-based survey was sent to the identified experts. Each of them received a survey to complete. The target was to evaluate an amount of 76 surveys and to

collect a total of 1900 answers, 25 answers per survey. Before implementing the surveys, a pretest was executed to ensure a good understanding of the questions and to adapt the questionnaire where necessary.

The survey consisted of five sections corresponding to Porter´s five forces: bargaining power of buyers, bargaining power of suppliers, competitive rivalry, threats of new entrants, and threats of substitutes. Each one of these sections again contained five different variables as a unit of analysis over Porter´s forces. The variables had been allocated to the five forces in a previous study and enabled us to observe the competitive intensity in more detail. An example of a variable is the growth of "governmental regulation, property rights, and patents" which measures Porter's forces of "bargaining power of buyers" and "threat of new entrants". Another example is the variable growth of the "number of suppliers for the specific product", which acts again as an indicator for the "bargaining power of suppliers". A complete list of the different variables and their allocation to Porter's forces can be extracted from Appendix 1.

The questionnaire used a Likert scale to measure the effect of the business model pattern against the different Porter´s forces and the variables. The Likert scale has a range from 1 – 7 to evaluate the intensity of an effect, with 1 being as a low positive effect and 7 being the strongest positive effect over a force of Porter´s. A high value indicates that a Porter force has been reduced, and consequently there is a higher success rate for a business model if this business model pattern is applied.

Data Analysis

As stated before, we used Gassmann's list of identified patterns. In a first step, we created a library of patterns, grouping them according to their value dimension (Gassmann et al. 2013). In a second step, we selected 19 patterns in order to implement the analysis and find any possible common behavior between the business model patterns and their specific performance over Porter's forces (compare Table 1 for an overview of the selected patterns). Finally, we conducted surveys and gathered data to show the intensity of the positive effect of the business model patterns against Porter´s forces. The aim was to extract guidelines for how to

create reliable combinations of business model patterns in order to counteract Porter´s forces.

Results

A Mood's median test was run to evaluate how the business model patterns performed against Porter's forces. By doing this, it was possible for us to detect which of the forces was mitigated the greatest. The results of the test showed that 4 out of the 5 value propositions had a significance level of 0.05. Thus, it can be concluded for these four value propositions that the business model patterns share a common behavior according to the value dimension they are allocated to. This holds true for value creation, value capture, value communication, and distribution channels. Only for the dimension of value proposition does not enough evidence exist.

Additionally, after calculating the mean values of the different business model patterns, it was possible for us to identify a common behavior according to the value dimension to which the business model patterns are allocated. As a reference point to decide whether a value dimension has a strong effect or not, we chose 5, because 5 was the overall median of four out of five value dimensions. All business model patterns with a value above 5 can be interpreted as having a sufficiently positive influence over the respective Porter's force. Therefore, this pattern can be recommended for overcoming threats in this area. The patterns (belonging to the value proposition) showed the strongest positive effects against the "competitive rivalry" force. The dimensions of "value creation" and "value capture" showed a good performance against the "bargaining power of suppliers"; the patterns from the dimensions of "value communication" and "distribution channels" against the "bargaining power of buyers". All these results were confirmed by the Mood's median test. For the forces "threat of new entrants" and "threat of substitutes" no value dimension showed an overall value above 5. In this case, it is possible to recognize some patterns that have a value above 5. For the force "threat of new entrants", we have the patterns "ultimate luxury", "mass customization" and "direct selling". For the force "threat of substitutes" the unique business model pattern with a value above 5 is that of the "lock-in" pattern. Table 1 gives an overview of all the results we obtained from the surveys. Figure

		Bargaining power of buyers	Bargaining power of suppliers	Competitive rivalry	Threat of new entrants	Threat of substitutes
Proposition	Cross selling	4.5	4.65	5.05	3.55	3.85
	Ultimate luxury	4.9	4.5	5.75	5.1	4.65
	Lock in	5.3	0	5.05	4.6	5.10
	Barter	5.25	4.65	5.33	4.58	4.37
	Overall	**4.99**	**4.60**	**5.23**	**4.43**	**4.46**
Creation	Digitalization	4.95	5	4.8	4.55	3.8
	Integrator	5.5	5.5	4.75	4.75	4.65
	Orchestrator	4.75	5.35	4.19	4.2	3.875
	Mass customization	4.5	5.55	4.10	5.15	4.45
	Overall	**4.925**	**5.35**	**4.50**	**4.66**	**4.24**
Communication	Customer loyalty	5.5	5.4	3.62	3.66	4.8
	Experience selling	5.2	4.6	4.24	4.08	3.84
	Ingredient branding	5.75	4.95	4.9	5	3.83
	Overall	**5.46**	**4.95**	**3.82**	**4.26**	**3.91**
Distribution Channels	Affiliation	5.2	4.25	3.75	4.75	4.85
	Direct selling	5.7	4.41	4.2	5.375	4.81
	Shop in shop	5.25	4.5	4.25	4	3.4
	e-commerce	5.44	5.68	4.8	4.8	4.44
	Overall	**5.40**	**4.85**	**4.33**	**4.85**	**4.35**
Capture	Flat rate	5.25	5.35	3.75	4.13	5.00
	Franchising	5.10	6.25	3.85	3.94	3.85
	No frills	4.65	5.40	4.20	3.90	4.95
	Razor and blade	4.65	4.85	4.25	4.00	3.63
	Overall	**4.91**	**5.46**	**4.01**	**3.99**	**4.36**

Table 1: Mean values of the value dimensions against Porter's 5 forces

3 summarizes the overall performance of the value dimensions related to Porter´s forces.

Besides collecting the data, the aim of this study was to examine how existing tools, such as business model patterns, can be used for business model innovation as a reaction to identified/potential upcoming business models threats. After completion of data collection it was possible to determine which value dimension performs best to counteract Porter´s forces. Table 1 shows the performance of each business model pattern, whereby the patterns are arranged according to the dimension they belong to, and it indicates which business model pattern is the most appropriate one for
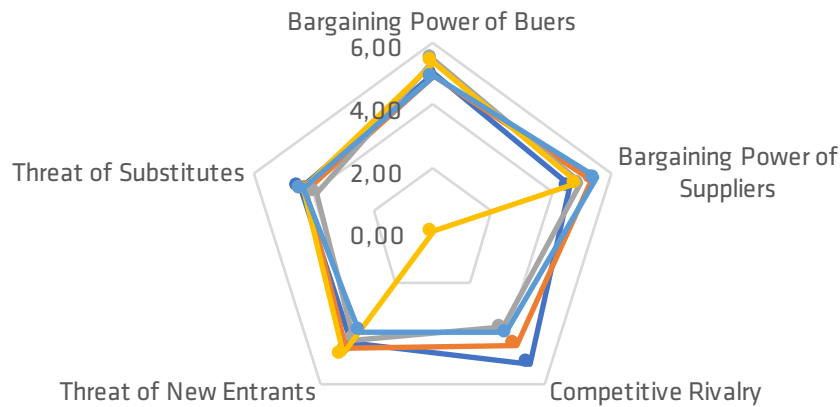
Figure 3: Overall performance of the value dimensions of a business model against Porter's 5 forces

counteracting a specific force of Porter´s. A higher number indicates a good performance against that force. Patterns with a number higher than 5 (highlighted in green) are recommended for use in mitigating the corresponding force. Some patterns proved to be effective against several forces, e.g. "franchising" and "lock in". As explained earlier, patterns from the dimensions "value communication" and "distribution channels" work well against the power of buyers; patterns from the dimensions "value creation" and "value capture" can be applied against the threat of "bargaining power of suppliers", and patterns from the dimension "value proposition" work well against the threat of "competitive rivalry". Furthermore, it is possible to create combinations of these factors. In two domains, no value dimension proved to be effective in counteracting the threats of any of Porter´s five forces. This was the case for "new entrants" and "substitutes".

Discussion

The findings from our study show that business model patterns can constitute an approach to overcoming threats to businesses and to generating successful business models. Gassmann identified 40 different patterns, 19 of which we analyzed and assessed ac-

cording to their impact on threats within the industry. To assess threats we used the well-established five forces of Porter. They can be seen as an early warning system for companies and can help to analyze the level of competition within the industry. The results of the study can help companies to use the business model patterns in a systematic way in order to react to identified or potential threats.

Bargaining Power of Buyers

Porter identified buyers as a potential threat to companies. Buyers have bargaining power and can force companies to reduce their prices or to improve the quality of their product, which can result in lower profit margins for companies (Porter, 2008, p.30). Five variables were used to determine the effect of business model patterns against the bargaining power of buyers. One example is the variable "number and distribution of buyers".

The results from the study show that patterns which can be assigned to the value dimensions "communication" and "distribution channels" are especially effective for addressing the threat of the bargaining power of buyers. The two value dimensions interact well and

are both visible to the customer and affect customers directly. Hence, patterns such as "customer loyalty" or "direct selling" can be applied. It is necessary to communicate to buyers that their needs are being addressed and also to communicate the value proposition of a product properly. Customer loyalty, for example, can be increased by creating an emotional bonding or by rewarding loyalty with special offers (Gassmann et al., 2013). If a customer is loyal to a company, the threat that she or he will use their bargaining power is reduced.

Bargaining Power of Suppliers

The bargaining power of suppliers is also identified as a risk in the business environment. Suppliers can influence prices and limit the quality and/or quantity of the supplied products. This squeezes profitability and can even force companies to exit the market (Porter, 2008). Factors for this force are "number of suppliers for the specific product" or "own possibility to use substitutes". We identified business model patterns from the dimension of "value creation" and "value capture" as being effective against this threat. Improved resource management and new, innovative developing processes can reduce dependency on suppliers. Managers can use, for example, the business model pattern "mass customization" to address this threat. Gassman defined this pattern as an approach of modular products and productions systems that enables an efficient individualization of products at competitive prices (Gassmann et al., 2013). A further pattern which was identified to reduce the bargaining power of suppliers is that of "integrator". Here, control of all resources and capabilities in terms of value creation should lie with a company. Hence, dependencies on suppliers can be reduced and costs decreased (Gassmann et al., 2013). Patterns which can be applied from the dimension of "value capture" are "franchising" or "flat rate".

By having efficient processes and increasing its profit margins, a company can respond better to rapid changes in the environment, such as an unexpected change of price, lack of resources from a supplier, or even the exit of one supplier. Applying patterns from the dimensions "value capture" and "value creation" increase the ability of companies to react to unexpected changes in business environments and to reduce the power of their suppliers.

Competitive Rivalry

Business model patterns from the dimension "value proposition" proved to be adequate to deal with competitive rivalry. This seems natural, since value proposition focuses on what makes a product or service superior to that of the competitors. Furthermore, it addresses the question "Why do customers buy our products?". Rivalry is present in many forms and depends on different factors, such as the number of competitors, resources, costs etc. (Porter, 2008).

The identified patterns were "cross selling", "ultimate luxury", "lock in", and "barter". All four were assessed to work well in addressing the degree of competitive rivalry within a company. Applying, for example, the "lock in" pattern, consumers are prevented from switching to the competition by high switching costs. Lock in can be generated, for example, by technological mechanisms or by substantial interdependencies of products or services (Gassmann et al., 2013).

Threat of New Entrants

The profitability of the whole industry sector depends, amongst other things, on the number of potential and existing competitors. Hence, monitoring the threat of entrants can help to develop strategies against new competitors. Entry barriers, for example, make it difficult for an outsider to replicate a business model (Karagiannopoulos, 2005). However, usually in a business model environment it is difficult for a firm to control the entrance of a competitor. Although we were able to identify some business model patterns which are appropriate for addressing the threat of new entrants, these are diversified and are from different value dimensions. Our results show no evidence of a specific value dimension which reduces the threat of new entrants.

Although it is in general difficult for companies to prevent new market entrants at all, the question is: How can companies protect their market against new entrants? We found that the business model patterns "mass customization" (value creation), "direct selling" (distribution channels), and "ultimate luxury" (value proposition) can be applied. In the direct selling pattern, for example, a company's products are not sold through intermediary channels. Thus by reducing the supply chain, profits can be increased. The savings can

pose a price advantage and the close contact to the customer can improve customer relationships (Gassmann et al. 2013). The effect in all three identified patterns is similar: the threats of new entrants can be tackled by cost advantages, by addressing customers' needs better than the competition, and/or by improved customer relationships.

Threat of Substitutes

Porter defined substitutes as products or services that offer the same service or function in a similar way but by different means. Substitutes can be from the same family of products or from a different one (Porter, 2008). They threaten business models because consumers can choose to purchase the substitute instead of the industry´s product. In our study, no value dimension was found that reduces the threat of substitutes in particular. It is hard to control the factor of competitors developing substitute products or consumers choosing to buy substitutes. The only pattern that appears to have a positive effect against the threat of substitutes is the "lock in" pattern. Here, changing to another vendor is accompanied by high switching costs, and thus customers are discouraged from switching to a substitute product (Gassmann et al., 2013). Our study did not consider all the business model patterns that were identified by Gassmann. Further research should be conducted in order to examine whether another pattern can mitigate the threat of substitutes within an industry.

Managerial Implications

Overall, we could confirm that if business model patterns have a similar impact on value dimensions, it is possible to systematically innovate business models by combining different patterns from different value dimensions.

The utilization of business model patterns as a tool for creating innovative business models offer a wide range of opportunities. It enables companies to react systematically against external shocks or threats, by combining two different perspectives: (1) The "internal" business model perspective with its five elements like value creation, proposition, capture, communication, and distribution channels and (2) the external perspective using Porter's 5 forces with its five elements

like bargaining power of buyers, bargaining power of suppliers, competitive rivalry, threat of new entrants and threat of substitutes. Using business model patterns allows companies to reduce the effort of developing business models, and the patterns library increases the possibilities of innovation in a reliable way. Furthermore, one of the main concerns of companies when developing new business models or changing existing ones is to develop a "not useful" or ineffective (dysfunctional) business model. With our approach we reduce the likelihood of developing a business model which does not work; nevertheless, our approach will not guarantee the development of the best business model. Another advantage is that by using patterns in a systematic way, the development costs and time can be reduced, which allows companies to react more quickly to changing market conditions by developing faster business model prototypes (which means combining patterns in a new way).

We have defined five steps for using business model patterns as a tool to counteract the pressure of any of Porter's five forces:
1. Identify those forces of Porter's that pose the highest risk for the business model and, depending on priority, start looking for possible solutions to deal with the identified forces.
2. Go through the list of business model innovations based on specific patterns and choose the recommended patterns that were identified as capable of counteracting the pressure of a specific force of Porter´s.
3. Select different business model patterns and run a brainstorming session in order to decide which might be a suitable combination of different business model patterns from the different business value dimensions.
4. If necessary, go through the business model patterns library and use it as a pool of ideas in order to find new possibilities for innovation.
5. Implement a business tool for analysis, such as CANVAS, to analyze the different advantages and disadvantages of the new business model.

For example, how can companies reduce the likelihood of Porter's force of new market entrants? Looking at Table 1, we see that there are three possible business model patterns related to value proposition, value

creation, and the distribution channels: ultimate luxury, mass customization and direct selling. Companies which implement at least one of these business model patterns can reduce the likelihood of new market entrants, and therefore counteract Porter's force of new market entrants. Combining different business model patterns, which means using perhaps both ultimate luxury and mass customization will have at least a higher likelihood of counteracting Porter's force, but a company which sells luxury goods is less likely to mass produce its products, less likely to have fixed costs, and less likely to develop economies of scale. Hence, if the factor "economies of scale" already exists, it does not seem useful to implement the pattern of "ultimate luxury" in order to counteract the threat of new entrants. Nevertheless, it is possible to use the pattern "mass customization" in combination with direct selling, as it works perfectly well and also helps to reduce the threat of new entrants. It might be an interesting opportunity to think about the combination of two business model patterns which do not really fit together at first glance. If companies are able to develop and overcome these counter-effects, they might develop a rather new (radical) business model which is robust against external effects/threats. Summarizing, combining different business model patterns both with complementary or supplementary effects is a great opportunity to identify "white spaces", which are the starting point for any new business model opportunities.

Conclusion

Companies have gained substantial experience in the last years with regard to how to master new product and service development. However, recent technological advances and economic challenges necessitate that they increasingly not only reshape their products (or continuously improve their processes), but that they also innovate their business model. Academic research has contributed to this issue by developing tools that aim to analyze the elements of a business model. One example is the business model canvas. It is a strategic management template for developing new or illustrating existing business models by outlining the way that a business model creates, captures, delivers, and communicates value out of a value proposition.

Another approach is that of business model patterns. Managers and decision makers can use these patterns

to generate systematically a new business model or adapt an existing one. The idea is that innovative BMs can be created by rearranging and composing existing patterns. Gassmann et al. (2013) identified 55 different BM patterns which can be used to enrich an existing BM with new elements. We analyzed the effect of such patterns against the threats to a BM by using Porter's five forces. These forces describe the competitive forces within an industry and can help to analyze the strength of threats to a company. We selected 19 BM patterns and evaluated their effect against each of the Porter's forces. In a quantitative study with experts from RWTH Aachen University, each BM pattern was assessed by the potential effect.

We were able to identify clear trends in the performance of patterns against Porter's forces. The results can furthermore help companies to make systematic combinations of these patterns to mitigate the threats. For the forces "bargaining power of buyers", "bargaining power of suppliers", and "competitive rivalry" we were able to identify specific value dimensions of the BM patterns. For the forces "threat of new entrants" and "threat of substitutes" the results are less distinct. Further research is needed in order to identify more BM patterns which might have a positive effect against those threats.

Further research is necessary in order to complete the library of business model patterns and to create a tool similar to the famous TRIZ. TRIZ ("Theory of Inventive Problem Solving") is a problem solving method based on logic and data, which relies on the study of patterns of problems and solutions. It is based on the assumption that "somebody somewhere has already solved this problem (or one very similar to it.)." Creativity is now finding that solution and adapting it to this particular problem (TRITZ JOURNAL, 2016). In our study we were able to extract recommendations for actions on how to react to business threats. The results can also help decision makers to innovate better business models and researchers to better understand the effects of business model elements on threat factors.

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Appendix
Appendix 1: Variables for measuring/ operationalizing the 5 forces of Porter's

Bargaining Power of Buyers
B1- Number and distribution of buyers
B2- Governmental regulation, property rights, and patents
B3- Flexibility to change to a new product or price sensitivity of buyers
B4- Share of customers' turnover/profits
B5- Own strategic competitive advantage (cost leadership, differentiation, innovation, or operational)

Bargaining Power of Suppliers
S1- Number of suppliers for the specific product
S2- Importance as a buyer/ supplier loyalty
S3- Own possibility to use substitutes
S4- Governmental regulation
S5- Own strategic competitive advantage (cost leadership, differentiation, innovation, or operational)

Competitive Rivalry
R1- Product/ Service differentiation
R2- Market profitability and potential
R3- Completeness of information about the product
R4- Surplus capacity
R5- Government investment in development of new products and services

Threat of New Entrants
NE1- Existing economies of scale and scope
NE2- Capital intensity of market entrance
NE3- Governmental regulation, property rights and patents
NE4- Access to trade channels
NE5- Firm's/Brand's reputation

Threat of Substitutes
SUB1- Costs and risks of a return for buyers from a substitute product
SUB2- Quality and benefits of the substitute
SUB3- Buyers' resources
SUB4- Governmental regulation
SUB5- Technological improvements

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