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## Working Paper

# Developing a potential business model for the automotive and the energy industry

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Holger Benad / Martin Bode / Andreas Hack / Peter Kleine-Möllhoff  
Hanna Wagner

## Developing a potential business model for the automotive and the energy industry

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## Abstract

This paper aims to present a sustainable business model for eMobility. In order to achieve this goal four different working packages are created. First of all different types of innovation are studied and defined focusing on disruptive innovations. Next different definitions of business models are analyzed and a modified business model is designed which includes eight main components - strategy, value proposition, financial aspects, resources, processes, environment, networks & channels as well as customer & market scope. In the following part the company *Hilti*, a supplier of the construction industry is researched and analyzed regarding its business model and the possible disruptive innovation "fleet management". Then based on previous analyses a business model for eMobility is developed. The proposed business model aims at propagating eMobility, making effective advertising and testing different technologies in the field. Therefore the paper is introducing a business model for a taxi company and defining each component in detail. It presents potentials of eMobility in general and facts about the taxi industry to generate a better view of the overall situation. The paper closes with an outlook on further potentials of the proposed business model.

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# 1. Introduction

The aim of this work is to develop a sustaining business model for the further propagation of eMobility in Germany. Therefore it is necessary to answer the following questions: What is a business model? Why do organizations need a business model and what is the content of it? These questions will be answered with the help of literature and with a field research using the example of *Hilti* Corporation and their business concept.

Against this backdrop, special aspects are disruptive innovations. For that reason a definition is needed to find out, whether *Hilti's* concept can be named as such a type of innovation or not.

The project is divided into four different working packages. At the beginning disruptive innovations are analyzed and defined. Next is a detailed chapter about the development of business models and the framework, defined within this paper. Based on this information the concept of *Hilti* is introduced and adapted to the defined model. Finally the developed know-how is used to create a possible solution for an eMobility concept.



## 2. Disruptive Innovation

The term “innovation” is a well known catchphrase in today’s business life. The expression goes back to the Latin word “innovare” which could be translated as “renew” or “replace”. According to *Zimmermann* (2005) who quotes *König* (2001) an innovation could be defined as a purposeful development and implementation of new technical, economical and organizational, value adding problem solution.

*Randazzo* (2011) differentiates disruptive and sustaining innovations. He defines a sustaining innovation as an innovation that helps companies to better serve the needs of their customers. Sometimes sustaining innovations “improve their product at a faster rate than those improvements can be found useful” and therefore enable the development of disruptive innovation. He defines a disruptive innovation as a “[...] “good enough” ” product at a lower price”. According to *Schmidt* (2008) the Innovation as a whole can be divided into several types. [cf. Schm 08, p. 348] These types are represented in Tab. 1:

**Tab. 1: Types of innovation and their description**

Type of Innovation	Concise description
<b>Sustaining Innovation</b>	A new faster generation which starts at the high end of the market, quickly cannibalizes the old one and then diffuses downward to the low end.
<b>Disruptive Innovation</b>	Initially not very disruptive: The new product first encroaches on the low end of the existing market and then after a long time diffuses upward to the higher-end of the market, disrupting the older product catastrophically in the long run.
<b>New-Market Disruption</b>	Before encroachment begins, the new product opens up a fringe or detached market where customer needs are different from current low-end users.
<b>Low-End Disruption</b>	The low-end disruption also encroaches from the low end upward, first selling to price-sensitive low-end customers.

Here *Schmidt* and *Druehl* defined that a disruptive innovation starts at the low-end of an existing market. This could for example be a cheaper product which is good enough to do the job but offers less performance than the existing one. [cf. Mark 06, p. 5]

Other authors name the following points as characteristics for disruptive innovations:

- Simple [Anth 05]
- Different product or service attributes [Char 03X, p. 56]
- Unique selling proposition [Still 12, p. 2]
- Cost benefits (low price) [Still 12, p. 2]
- Based on new technology or new business model [Fleig, p. 2]
- Primarily only small customer group [Fleig, p. 2]
- Creating new markets by bringing non-consumers in [Chris 08, p. 44]
- Changing balance of power [Still 12, p. 2]
- Becoming dominant market factor and replacing established products [Fleig 09, p. 2]
- Long-term usage [Still 12, p. 2]

Nevertheless according to *Christensen*, the pioneer who mentioned the term disruptive innovation first in 1995, “a disruptive Innovation is an innovation that cannot be used by customers in mainstream markets. It defines a new performance trajectory by defining new dimensions of performance compared to existing innovations. Disruptive innovations either create new markets by bringing new features to non-consumers or offer more convenience or lower prices to customers at the low end of an existing market.” [Christensen et al. (2004), p. 293]

Since *Christensen* is mentioned by nearly all other authors, his definition is used in the paper as main explanation for disruptive innovations.

### 3. Business Models

Regarding the aim of this paper, to create a business model for eMobility, it is necessary to define what a business model is and its' content. A general definition for business models cannot be found in the common literature. Each author or company has their own opinion on this topic. An enterprise follows its predefined strategy. It is not clear, whether the strategy is a part of the business model or represents a superior business goal. With regard to *Shafer, Smith and Linder (2005)* it makes sense to analyze and define each single word first:

- **Strategy:**

A strategy is the long-term orientation of an organization. Depending on this explanation the strategy is a pattern, a plan, or a perspective that relates to choices about how the company wants to survive and develop. It is like a roadmap.

- **Business:**

This term can be defined as creation of value and capturing revenues from the created value. Therefore products as well as services are exchanged for money or other benefits. [cf. Budi 12]

- **Model:**

A model is a simple, individual or subjective representation of the reality.

- **Business Model:**

In this paper “a business model describes the rationale of how an organization creates, delivers, and captures value.” [Ost 09, p. 14] Strategy is the superior aim of an enterprise; it is the roadmap to achieve defined business goals. The business model of a company is one way to implement this roadmap and reach those aims via sustainable development.

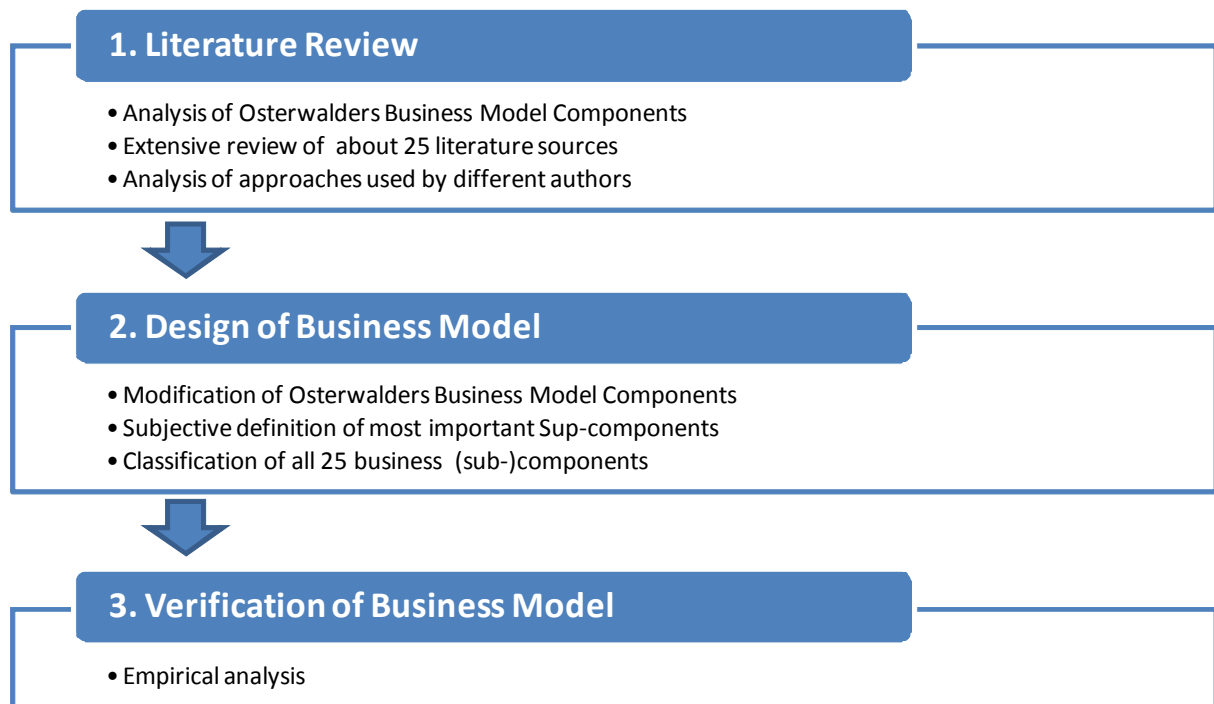
*Osterwalder and Pigneur (2009)* are systematizing the business model content into nine major building blocks:

- Customer Segments
- Value Propositions
- Channels
- Customer Relations
- Revenue Streams
- Key Resources
- Key Activities
- Key Partnerships
- Cost Structure

Most authors analyzed written documents from other scholars and figured out the components. Afterwards they counted the total amount of synonymous components and summarized them to key components. Depending on the total number of indications they figured out which component might be important for their business model and which one might not.

### 3.1 Design of Business Model

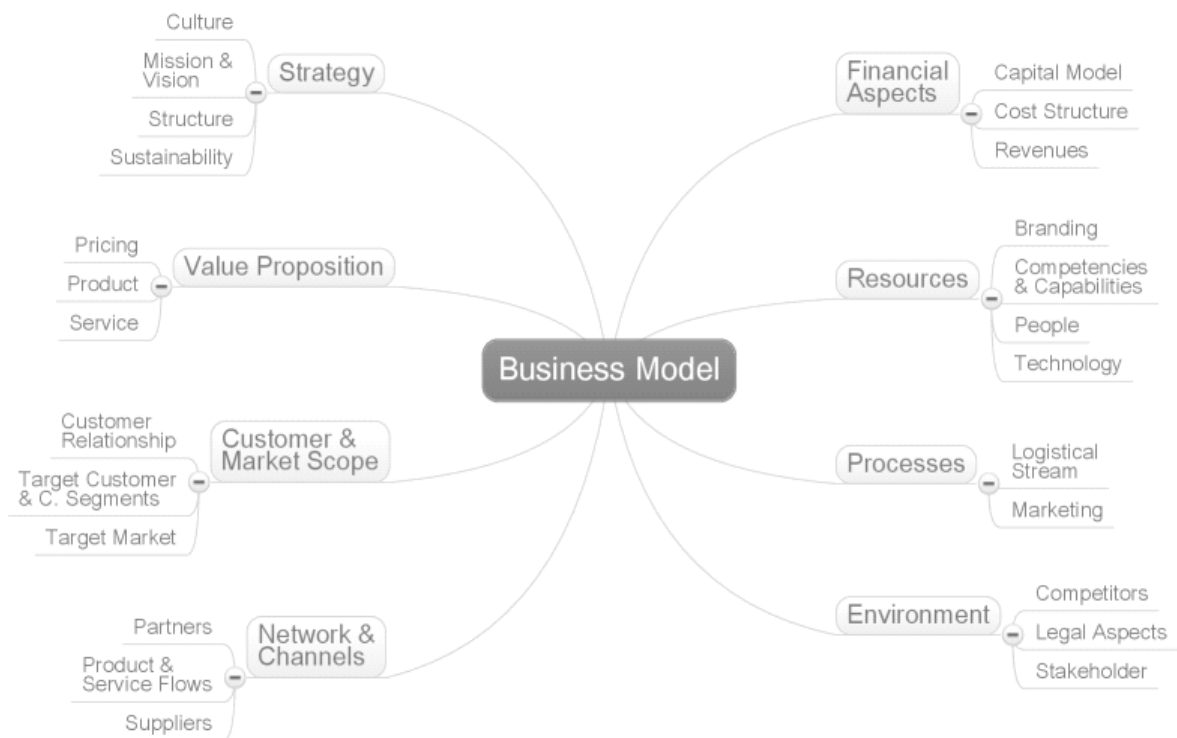
The following Fig. 1 shows the approach of designing a business model in this paper.



**Fig. 1: Approach of designing a business model**

The business model is based on the logic from *Osterwalder* and about 25 other literature sources. Therefore *Osterwalders* main components are modified, changed or extended into a new framework. Each main component contains several subcomponents describing it in more detail. *Shafer* (2005) created a table of "components of a business model" based on the described pattern above. With the knowledge of the literature research the most important subcomponents have been defined subjectively and completed by further subcomponents. This subjective framework was verified with an empirical analyzes afterwards. Therefore all mentioned components of the 25 sources have been classified to the designed model. In most cases the defined components or subcomponents were commonly mentioned in the literature. Some other components are also included in the business model of this paper, even if only a single author has mentioned them - the subjective opinion defined them as necessary.

The next picture shows the final result (Fig. 2):



**Fig. 2: Defined Business Model**

As shown the defined main components are Strategy, Value Proposition, Customer & Market Scope, Networks & Channels, Financial Aspect, Resources, Processes and Environment.

The following subchapters describe all main components and their sub-items in detail. To give an overview of the different definitions presented by various authors, in this chapter several definitions of each component and sub-component are shown. The sub-components cannot be viewed separately since they are all linked content wise.

## 3.2 Strategy

Various authors state the importance of strategy in the context of business models in different ways:

**Tab. 2: Definitions of strategy**

Author	Strategy synonym
<i>Chesbrough and Rosenbaum (2000)</i>	competitive strategy
<i>Weill and Vitale (2001)</i>	strategic objectives
<i>Applegate (2001)</i>	concepts
<i>Osterwalder (2009)</i>	strategy defines the key activities (“the most important things a company must do to make its business model work” [Ost 09, p. 34])
<i>Wirtz (2010)</i>	strategy model
<i>Morris, Schindehutte and Allen (2005)</i>	competitive strategy factor
<i>Shafer et al. (2005)</i>	strategic choices

Strategy “can be viewed in at least four different ways: as a pattern, plan, position, or perspective.” It is “viewed as a pattern of choices made over time.” [Shaf 05, p. 203]. *Ansoff (1965)* said that “Strategy can be seen as a conscious plan to align the firm with opportunities and threats posed by its environment” [Ches Ro, p. 2].

Therefore “Strategy is a well defined roadmap of an organization. It defines the overall mission, vision and direction of an organization” [Msg 12]. Strategy includes the Mission and Vision, the structure and culture of an organization and if the organization is sustainable or not.

### Mission / Vision

The mission, “one of the most critical elements of the business model is developing a high-level understanding of the overall vision, strategic goals and the value proposition including the basic product or service features.” [Alt 01, p. 6] The heart of a business model is the global core which is responsible for the key direction, the mission across the corporation. The vision is part of this global core and defines the identity of the corporation – a shared vision and value system. [cf. Viscio 96, p. 9]

## Structure

With his famous statement “structure follows strategy” the economic historian *Alfred Chandler* showed already in 1962, that strategy and the organizational structure are linked closely. [Whe 00, p. 187]

“Structure determines which roles and agents constitute and comprise a specific Business Community (be it a value chain or value web) as well as the focus on industry, customers and products.” [Alt 01, p. 6]

## Culture

Culture is an important element for a strategic-oriented company because “the innovation process is a blend of methodology, work practice, culture and infrastructure.” [Smith 05, p. 6]

Management of culture is making users and managers favor the new system and rethink existing ways of doing business. It requires strong communications of the strategic purpose of the company. [cf. Hede 03, p. 55]

*Hamel* (1999) argues that “a culture that welcomes ideas and suggestions without creating stifling political protocols” is essential for companies an innovation-oriented company. [Hamel 99, p. 11]

## Sustainability

*Dunphy, Benveniste, Griffiths and Sutton* mention: “Sustainability is a focus for a new value debate about the shape of the future. It is a signpost pointing to a general direction we must take, while the debate is engaged about the best path to lead us forward.” [Dunp 00, p. 15]

Furthermore they argue that through a sustainable orientation of an organization, activities that extend the productive life of an organization are created and the organization maintains high performance. [cf. Dunp 00, p. 6]



### 3.3 Value Proposition

The component (Customer) value proposition is named as an important key element and success factor of a business model by various authors [cf. Ches Ro, Linder 00; Ost 09, John 08].

*Osterwalder* defines value proposition as “[...] the reason why customers turn to one company over another. It solves a customer problem or satisfies a customer need. Each Value Proposition consists of a selected bundle of products and/or services that caters to the requirements of a specific Customer Segment. In this sense, the value proposition is an aggregation, or bundle, of benefits that a company offers customers.” [Ost 09, p. 20]

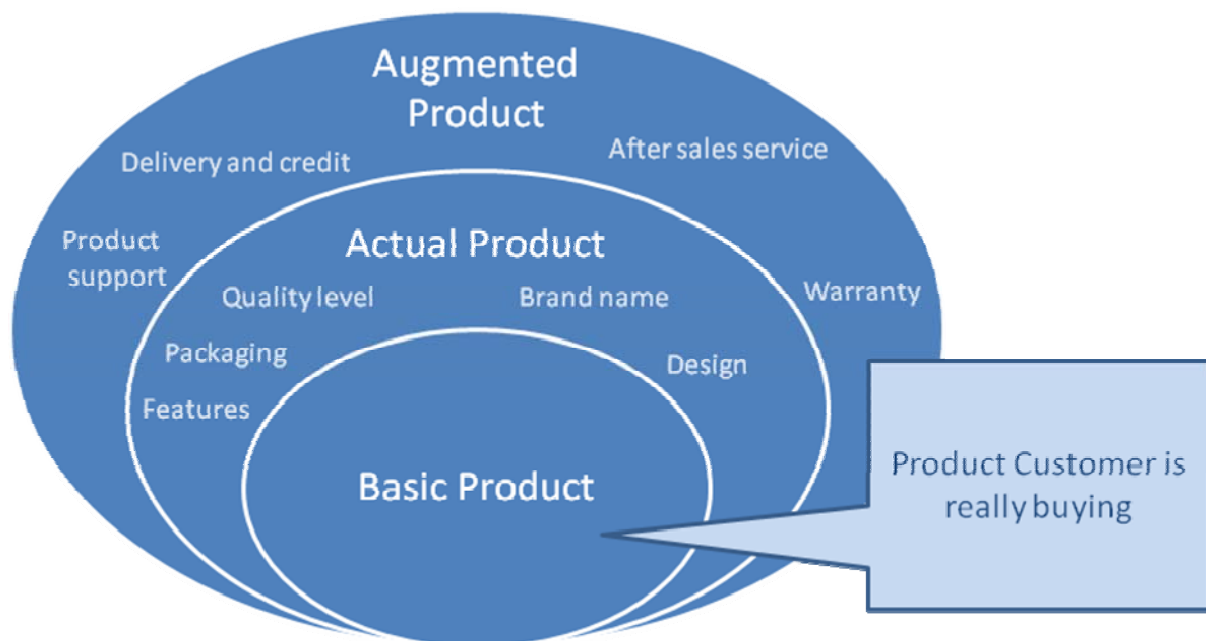
Hence the value proposition can be seen as value offering or value activity and includes the elements pricing, product and service. [cf. Hede 03, p. 53; Ches Ro]

#### **Pricing:**

Pricing is also important for the value proposition because “In order to serve a particular customer segment and compete with the forces within that segment, the offering must have a favorable quality/price position.” [Hede 03, p.53]

#### **Product/Service:**

The product/service mix defines the value offering. [cf. Morris 02, p.729] As shown in the picture below products are more than just the physical product (see Fig. 3). *Kotler* (2010) defines three different benefit levels of a product:



**Fig. 3: Different product levels [cf. Kotl 10, p. 250]**

### 3.4 Financial Aspects

“Financial aspects can be understood as costs required to get the infrastructure to create value and as revenues of sold value. The difference between revenues and costs determines the profitability of a company.” [Dubo 01, p. 7]

According to *Osterwalder, Pigneur and Tucci (2005)* financial aspects can be divided into cost structure which “sums up the monetary consequences of the means employed in the business model” and into a revenue model which “describes the way a company makes money through a variety of revenue flows.” [Ost 05, p. 18]

Other authors like *Rayport and Jaworski (2001)* speak about a financial model which defines different proposals “to generate revenue, enhance value, and grow.” The financial model includes the financing model, the capital model and the cost structure model which “together corresponds with the financial structure of an organization.” [cf. Wirtz 11, p. 113] In *Wirtz* definition the “financing model” shows where the capital comes from and the revenue model explains the different forms of revenues. He differentiates revenue sources as direct or indirect generation of revenue and transaction dependent or transaction independent generation of revenue. [cf. Wirtz 11, p. 39]

## Capital Model

The capital model “describes the logic of how financial sourcing occurs to create a debt and equity structure, and how that money is utilized with respect to assets and liabilities, over time.” [Petro 01, p. 3]

Therefore “profits and capital measure the value of the business operations. Profit is a measure of business efficiency - the difference between prices and costs of sold products/services. Capital is a measure of the asset value of the business - the difference between equity and liabilities.” [Betz 02, p. 22]

## Cost Structure

While operating any business costs occur. The cost structure explains the cost corresponding to creating and delivering value, maintaining customer relationships and generating revenues. If “Key Resources”, “Key Activities” and “Key Partners” are defined clearly those costs can be allocated easily. Depending on the business model and market in which a company operates companies are more or less focused on costs, e.g “no frills” airlines are extremely cost-driven since they need to be cheaper than their competitors. [cf. Ost 09, p. 40]

“Cost structures can have the following characteristics: Fixed costs - costs that remain the same despite the volume of goods or services produced; variable costs - costs that vary proportionally with the volume of goods or services produced, Economies of scale - cost advantages that a business enjoys as its output expands. Larger companies, for instance, benefit from lower bulk purchase rates, Economies of scope - Cost advantages that a business enjoys due to a larger scope of operations.” [Ost 09, p. 41]

According to *Johnson, Christensen and Kagermann (2008)* cost structure is defined by “direct costs, indirect costs (and) economies of scale” and is driven by the usage of key resources. [cf. John 08, p. 3]

## Revenues

“This element measures the ability of the firm to translate the value it offers to its customers into money and therefore generate incoming revenue streams. A firm’s revenue model can be based on subscription costs and fees from the customer, advertising and sponsoring revenues from other firms, commissions and transaction

cuts from provided services, revenue sharing with other firms and by simply selling a product.” [Dubo 01, p. 7]

According to *Alt, Zimmermann* (2001) revenues are the foundation of any business model. If a company does not generate value it does not matter what their business model is like. The long-term revenue aspects need to be balanced to maintain independence and viability. Whereas short- and mid-term strategy revenue sources and necessary investments need to be analyzed. [cf. Alt 01, p. 6]

### **3.5 Resources**

In order to generate value, every organization needs resources. By transforming those input resources and adding value along the process the generated output services or products can be sold back into the market environment. (cf. Tarondeau, 1999; Wernefelt 1994)

The resources of a cooperation can be differentiated by tangible resources (such as its personnel, plants, equipment, facilities, cash flows or -reserves, location, etc.) and intangible resources (such as design capability, patents, copyrights, reputation, brand names, trade secrets and relationships to customers and suppliers, etc.). [cf. Betz 02, p. 1; Dubo 01, p. 6]

*Grant* (1995) distinguishes tangible, intangible, and human assets. Human resources are defined here as the “people a firm needs in order to create value with tangible and intangible resources.” [Dubo 01, p. 6] The importance of human assets is shown by naming human assets as a separated topic.

Value configuration is defined by the “arrangement of activities and resources”. [Ost 05, p. 17] *Osterwalder and Pigneur* (2009) further describe resources as “the most important assets required to make a business model work”.

*Johnson, Christensen and Kagermann* (2008) include in resources “people, technology, products, facilities, equipment, channels, and brand”.

#### **Branding**

“Branding shifts towards relationship dynamics (Hamel, 2000) where emotional, as well as transactional elements in the interaction between firm and client, form the image of a company. It's the firm's ability to engage customers, suppliers, and other partners in mutually beneficial value exchanges that determines its relationship capi-

tal (Tapscott, Lowi, Ticoll, 2000) and brand.” [Dubo 01, p. 5] Branding enables a company to successfully distinguish its produced goods to those of a competitor with similar product attributes. “A brand is by definition a “name, term, sign, symbol or design, or a combination of these”. [Kot 10, p. 255] *Warren Buffet*, a famous investor, once said that brand is the most important factor in deciding where to invest. [cf. Clif 09, p. 5] “Several studies confirm the important role of brands in the B2B context and demonstrate that brands provide valuable equity for manufacturers just as they do for consumers, allowing manufacturers to gain substantial competitive advantages (Van Riel, Pahud de Mortanges & Streukens, 2005).” [Gly 09, p. 132]

### **Competencies & Capabilities**

“Firms might develop core competencies, capabilities, and positional advantages that are different from those of competitors” which enables them “to perform work activities in a unique way [...]”. [Shaf 05, p. 202]

“As the firm focuses on its core competencies and activities and relies on partner networks for other non-core competencies and activities there is an important potential for cost savings in the value creation process.” [Dubo 01, p. 7]

Increased revenue by being able to serve more customers faster and cheaper (due to automated processes) and better (due to greater visibility into the business processes and increased focus on the company's core competencies). [cf. Gartner 03, p. 6]

*Osterwalder, Pigneur and Tucci (2005)* mention that core competencies are “the competencies necessary to execute the company's business model.” [Ost 05, p. 18]

According to *Hedmann and Kalling (2003)* “Capabilities are built and delivered through its people and partners, organizational structure, culture, operating model, marketing and sales model, management model, development model, and infrastructure model.”

*Christensen and Overdorf (2000)* argue that in order to think about future capabilities resources, processes, and values need to be considered. [cf. Betz 02, p. 21]

By looking at definitions and statements regarding competencies and capabilities it gets obvious again, that all components are linked to each other.

## People

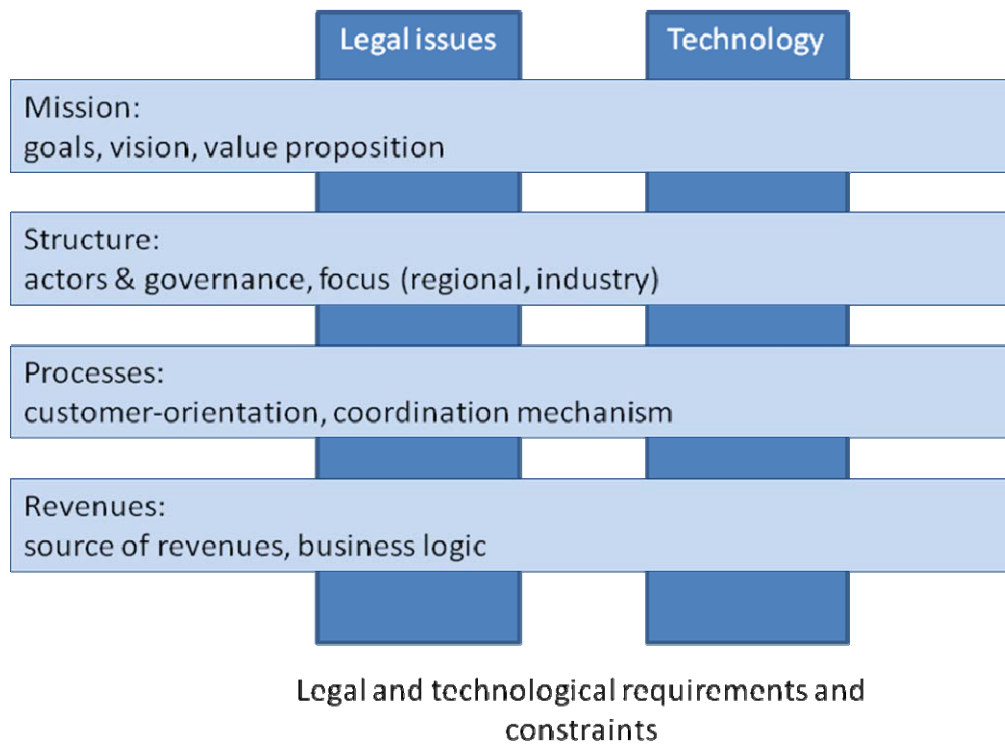
People are an important resource that can increase the performance of an organization. “Human resources”, “human capital”, “intellectual assets” and “talent management” all deal with the management of people that are employed within a company. By “identifying, recruiting and selecting” the right people for the right jobs a company can get a sustainable competitive advantage. [cf. SneBoh 12, p. 4])

The theory of human capital management implies that the people of an organization can create value. They can be regarded as assets in which organizations need to invest to gain worthwhile returns. [cf. BarArm 07, p. 10]

## Technology

According to *Roehm* (2003) the term “Technology” is derived from the Greek word “*techne*” (skill, draft, art) and can be defined in various ways. In a broad view “Technology” can be defined as all abilities, all knowledge and all procedures that are necessary to make, to use and to do useful things. Furthermore technology can be defined as “hard technology” which includes knowledge based understanding of processes, products and applications. [cf. Kra 09, p. 1f]

Regarding the technology companies need to consider ongoing technological developments and how those influence the business model design. [cf. Alt 01, p. 6] Each life cycle of products starts with an (new and different) emerging technology. The technology of a company needs to fulfill the customers’ individual circumstances and requirements, but also enables and limits the achievement of business goals equally. [cf. Horo 96, p. 2, 6] “Technological issues affect all aspects of business models, the overall mission, as well as structures, processes, and revenue models like shown in Fig. 4:



**Fig. 4: Interface of technology [c.f. Alt 01, p. 6f]**

### 3.6 Processes

*Johnson, Christiansen and Kagermann* as well as *Alt* and *Zimmermann* name "Processes" or "Key Processes" as important components of business models. [cf. Alt 01, p. 6; John 08, p. 1] According to *Johnson, Christensen and Kagermann* processes are defined as "training, manufacturing, service to leverage (those) resources". [John 08, p. 1]

Processes enable an organization to deliver the customer value proposition repeatable and scalable. [cf. John 08, p. 4] "Key processes might also include design, product development, sourcing, manufacturing, marketing, hiring and training, IT, rules and metrics. [John 08, p. 5]

They therefore provide a view on the mission and the structure of the business model and elements of the value creation process including requirements they address in the customer process (Österle 2000: 45). [cf. Alt 01, p. 6]

Important elements of processes in business models are the logistical stream and marketing.

## Logistical Stream

“[...] the logistical stream addresses various issues related to the design of the supply chain for the business” [Maha 00] including the “Production Model - (which) describes the logic of how elements are combined in the transformation process from the source to the output.” [Petro 01]

Value creation is closely linked to processes and the given resources. [cf. Shaf 05, p. 202]

## Marketing

*Peter Drucker*, ones said “marketing is looking at the business through the customer’s eye.” This means a market-oriented company always tries to be “one step ahead” of the customer (and the competition) by anticipating needs and fulfilling them.” [Fors 09, p. 6]

Marketing is a kind of “Philosophy”, the management of competitive advantage, a market-oriented way of leading the company. [Steffen 08, p. 52]

The ambition of marketing is “the process of building competitive advantage in the networked economy”. [Petro 01, p. 2]

According to *Forsyth* (2009) marketing can be seen as the business function that “identifies unfulfilled needs and wants, defines and measures their magnitude, determines which target market the organization can best serve, and decides on appropriate products, services, and programs to serve these markets.” Therefore marketing is closely linked to the component “Competitors”. In addition marketing is also connected to the components “Value Proposition” and “Strategy” in general.

Marketing strategy often dominates the strategic policies set because organizations are focused on optimizing sales and capital. [Betz 02, p. 26] A marketing strategy is needed “in order to assess the commercial viability and to answer questions like: how is competitive advantage being built, what is the positioning, what is the marketing mix, which product-market strategy is followed.” [Trim 98, p. 4]

According to *Trimmers* only a business model is not enough. To be successful furthermore a marketing strategy is necessary. [cf. Wirtz 11, p. 34]





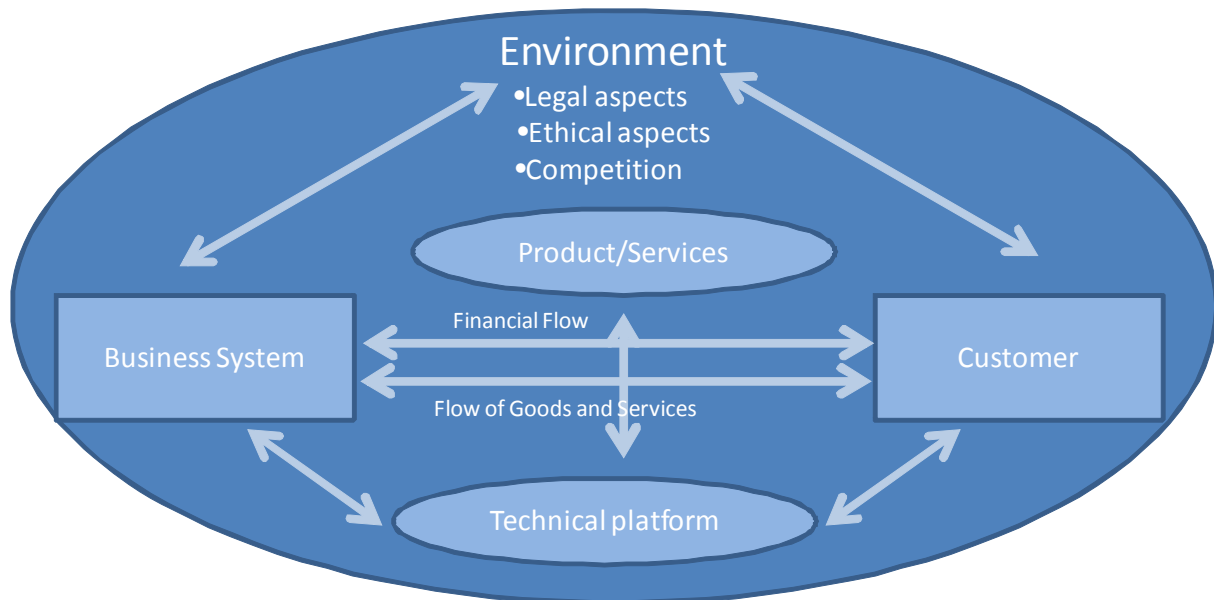
**Fig. 5: Different levels of strategy [cf. Fer 05, p. 35]**

As shown in Fig. 5 marketing can be seen as part of the strategy and includes the “4P’s” “Product, Distribution, Promotion and Pricing”.

Resources and sales provide the issues for the direct production transformations of a business operation. [cf. Betz 02, p. 21]

### 3.7 Environment

As shown in Fig. 6 the environment includes different business model components and deals with legal and ethical aspects as well as competition.



**Fig. 6: Environment of a company [c.f. Stan Slab, p. 5]**

Organizations need to focus on legal aspects, stakeholders and competitors in their environment. While observing the competitor the “entrepreneur attempts to define a unique, defensible niche enabling the firm to mitigate ongoing developments in the environment. [...] The challenge is to identify salient points of difference that can be maintained.” [Morris 02, p. 5] This subchapter deals with legal aspects, competitors and stakeholders.

#### Legal Aspects

While developing a business model it is important to stick with general legal conditions, e.g. the environmental regulations in Germany are more stringent than in China or South Africa.

“Legal issues have to be considered with all dimensions of business models: e.g., legal issues may influence the general vision. [...] Legal issues also may influence decisions on structures of value creation systems like value webs, processes of value creation (e.g., privacy laws), and revenue models.” [Alt 01, p. 5]

## Competitors

According to *Hedmann* and *Kalling* (2003) competitors are an important component of the business model. Every innovation that should be placed in the market needs to improve the costs “[...] and quality of the offering in relation to customer preferences and competitors.” [Hedman-Kalling 03, p. 6] If you want to succeed in business your business model needs to be at least as good as your competitors. You have to know and observe your rival, its actions and development. [c.f. Hedman-Kalling 03, p. 6]

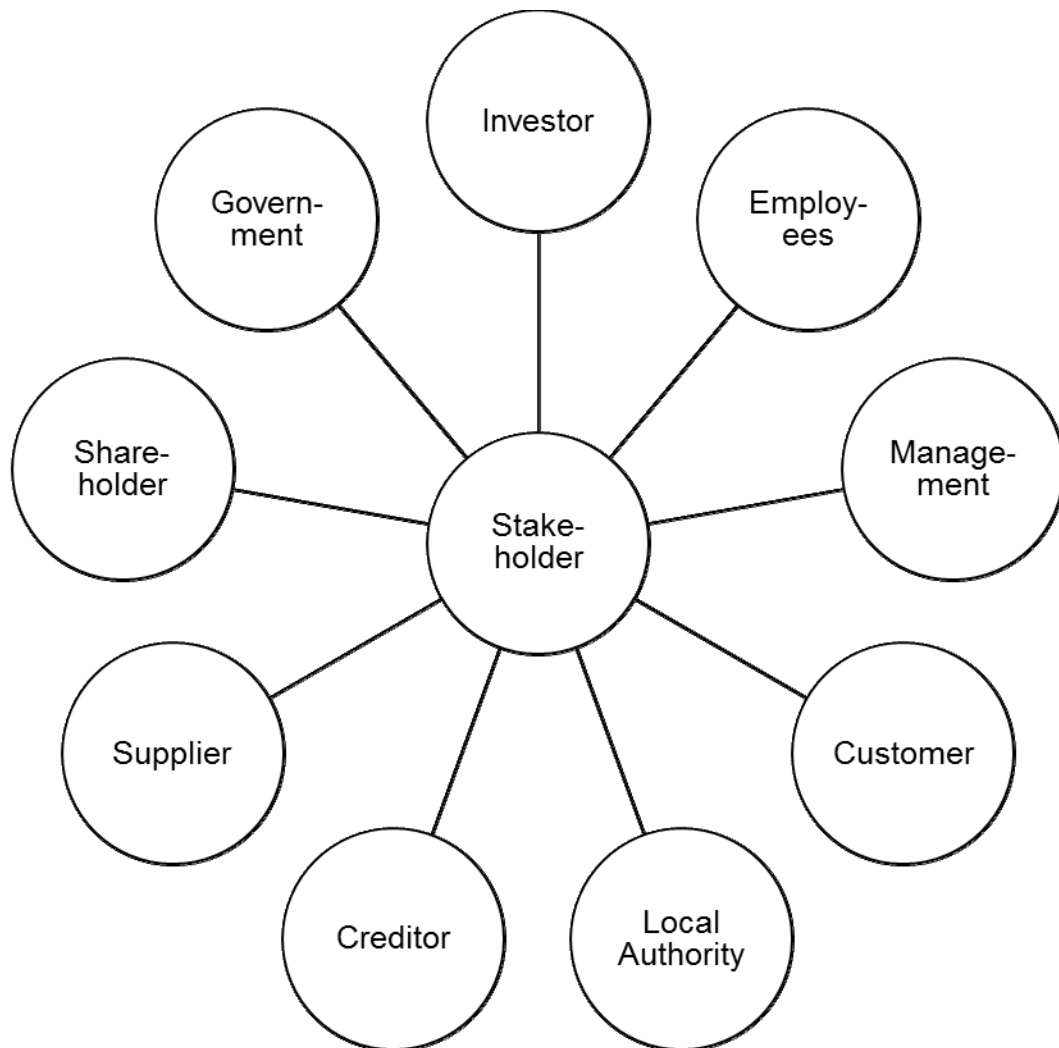
## Stakeholders

An important part of every company’s environment is the stakeholder. Stakeholders are people who are affected by or who affect “actions, decisions, policies, practices or goals of the organization.” [Polonsky 05, p. 1063f] You can characterize them with the following “three [...] features, namely:

- (1) Interdependency
- (2) Affecting/ being affected by the organization
- (3) The sense of an interest or right in the organization”

According to *Hedmann* and *Kalling* (2003) “The value of a business model is measured by its return to all stakeholders, return to the organization, market share, brand and reputation, and financial performance.” [Hede 03, p. 52]

Stakeholders include investors, employees, board of management, suppliers, customers, community, creditor, shareholders and state (see Fig. 7).



**Fig. 7: Stakeholders of an enterprise [cf. Lei 97, p. 97]**

### 3.8 Networks & Channels

The external relationships to customers and partners and the resulting product and service flows are defined in this subchapter. Channels are important because through them the “value propositions are delivered to customers.” [cf. Ost 09, p. 16] and companies are enabled to reach their customer segments. The functions of the channels are: [Ost 09, p. 26]

- “Raising awareness among customers about a company’s products and services
- Helping customers evaluate a company’s value proposition
- Allowing customers to purchase specific products and services

- Delivering a value proposition to customers
- Providing post-purchase customer support “

The network includes “suppliers, partners, distribution channels, and coalitions that extend the company’s own resources” [Shaf 05, p. 4] and increases the chance to identify potential partners or competitors. The company is able to operate with these parties. [c.f. Ches Ro, p. 9; Dubo 01, p. 6]

“The value network created around a given business shapes the role that suppliers, customers and third parties play in influencing the value captured from commercialization of an innovation.” [...] it increases the supply of complementary goods on the supply side and can increase the network effects among consumers on the demand side.” [Ches Ro, p. 8]

### **Partners & Suppliers**

Every company needs partners. Partners and suppliers are responsible to make your business model work especially nowadays in a globalized world where outsourcing is an important topic. [c.f. Ost 09, p. 17, 39]

*Osterwalder* says that “Companies create alliances to optimize their business models, reduce risk, or acquire resources.” According to him partnerships can be differentiated in “Strategic alliances between non-competitors, Cooperations: strategic partnerships between competitors, Joint ventures to develop net businesses [and] Buyer-supplier relationships to assure reliable supplies.” [Ost 09, p. 38]

### **Product & Service Flows**

Referring to *Gordijin, Akkermans* who talks about value exchanges between two actors, product and service flows are defined as an important part of a business model. [c.f. Gor Akk , p. 3] Other authors, e.g. *Mahadevan* (2000), talk about value streams which are defined as “[...] a process view focusing on product flows across organizational boundaries. [...] This activity can be used to help find and prioritize the non-value-adding steps.” [Hill 11, p. 376]

### 3.9 Customer & Market Scope

This subchapter addresses the requirements of a product concerning its customers and market. It deals with customer relationships, the target customer and customer segments, as well as the target market.

#### Customer Relationship

The relationship to the customer is very important because the more information and knowledge you have about your customer the better you can develop your value proposition. A company that has many customer contacts and maintains the relationships to its customers has a higher opportunity to improve its products, for example new customers can be attracted because you know more about customer needs. “A firm must ask itself how it wants to deliver additional value to its customers and what support and service level it wants to provide.” [Dubo 01, p. 5] You have to “[...] exploit existing customer relationships by getting a feel for the customer’s desires, serving him and developing and enduring relationship with him.” [Dubo 01, p. 4]

Due to good customer relationships an organization for example is able to [cf. Ditt 05, p. 7]:

- Create long-lasting customer relationships and therefore improve profitability
- Better serve the customers’ needs
- Increase service and quality
- Adjust processes with regard to the customer
- Increase efficiency within the network
- Increase return on investments
- Spot trends within the market

#### Target Customer & Customer Segments

“An organization serves one or several Customer Segments.” [Ost 09, p. 16] “Customer Segments [...] are different groups of people or organizations an enterprise aims to reach and serve. [...] In order to better satisfy customers, a company may group them into distinct segments with common needs, common behaviors, or other attributes. [...] An organization must make a conscious decision about which segments to serve and which segments to ignore. Once this decision is made,

a business model can be carefully designed around a strong understanding of specific customer needs.” [Ost 09, p. 20]

The target customer “describes the segments of customers a company wants to offer value to.” [Ost 05, p. 18]

In order to fulfill the customers’ need and create a suitable value proposition the targeted customer segment has to be studied intensively “to find out the relevance and the components of an effective value recognition by the customer”. [Dubo 01, p. 3]

### **Target Market**

“A market segment is a concept that breaks a market (consisting of actors) into segments that share common properties.” [Gor Akk, p. 13]

*Petrovic, Kittl and Teksten (2001)* named it market model which describes the reason why an environment is chosen. [cf. Petro 01, p. 3] *Wirtz (2011)* describes the dependency of his “market offer model” from the market structure, competitors and “the fit between the value proposition and existing market potential”. [Wirtz 11, p. 96] Best matches the definition of *Morris, Schindehutte and Allen (2002)* that market factors “focuse[s] on the nature and scope of the market which the firm competes. To whom will the firm sell and where in the value chain will it operate?

Customer types, their geographic dispersion, and their interaction requirements have significant impacts on how an organization is configured, its resource requirements, and what it sells.” [Morris 02, p. 4f]

### 3.10 Conclusion

A business model is needed to reach the business goals behind a company's strategy which is their superior aim. Since there is no clear definition of the term "business model" in literature it is useful to study different authors and their impacts and opinions on this topic. *Osterwalder* categorized the content of a "business model" into nine categories. The result of this paper is a modified version of his business model. It contains eight main components for organizing 25 special sub components. The content behind those items describes how a company creates, delivers, and captures value.



## 4. The Hilti AG

The *Hilti* corporation was founded 1941 in Schaan, Liechtenstein. The Headquarter of the company, which operates worldwide in over 120 countries, is still located there. In the year 2011 *Hilti* achieved with 21,000 employees a turnover of 3,998 Mio. CHF. [cf. HiCr 11, p. 3]

*Hilti* plays an active part in the construction industry and develops, produces and sells high technological innovative products like demolition tools, anchoring systems, diamond coring and cutting equipments, installation systems, fire stop systems, screw fastening systems, and foam systems. As an additional value they offer some services, for example user healthy and safety measures, lifetime services, planning and specifying, repair and calibration and fleet management. [*Hilti* 12]

The next subchapter focuses on the special service fleet management as an innovative feature in this industry.

### 4.1 Fleet Management

*Hilti* advertises fleet management with the following slogan:

*“We manage your tools, so you can manage your business”*

This tagline describes the function of fleet management. While the customer is just using the tools for a constant monthly charge, *Hilti* as the owner of those tools takes care of the whole administrative affairs. For the duration of the contract they are responsible for accounting of tools, service and repair maintenance including logistics. [cf. FmSt 05, p. 27]

Fleet management was established as a result of a comprehensive customer and market analysis in 1999, to solve a customer problem. They identified that tools have a low priority for big companies. Most firms did not put much effort into managing tools like investment and repair planning. [cf. FmSt 05, p. 25ff.] Based on the results of this analysis, *Hilti* designed a kind of business model to provide big customers with a new service value and increase the customer loyalty, their profit and differentiation from competitors. [cf. HiFm 11, p. 110]

Since *Hiltis* fleet management offers a completely new service attribute to the customers in the construction industry, one could describe this as a disruptive innovation. To validate this statement *Christensens* definition from chapter 2 has to be considered. He defines a disruptive innovation, as an innovation, that cannot be used by customers in mainstream markets. *Hiltis* fleet model is designed only for financially strong customers in selected countries.

The additional service attributes which are created by the fleet program, can be seen as a new dimension of performance compared to existing innovations, as *Christensen* continuous in his definition. However, considering the last statement of his definition, *Hilti* neither creates a new market by bringing new features to non-consumers nor do they offer lower prices to customers at the low end of an existing market, even if they offer more convenience. [*Hilti*Exp 12]

In conclusion *Hiltis* fleet management is a service innovation (“[...] as an idea or a performance enhancement that customers perceive as offering a new benefit of sufficient appeal”) but not a disruptive one according to the definition. [Ber 06]

## 4.2 Business model analysis

As mentioned in chapter 3 a lot of scholars and companies have their own idea of business models, so does *Hilti*. They defined their business model graphically as shown in the next figure (see Fig. 8):



Fig. 8: Business Model *Hilti* [Hilti 12]

Their intermediate-term key concept is called the “Champion 3C Strategy”:

- **Customer:** Their needs set *Hilti's* next steps to develop new products and services
- **Competence:** Groundbreaking technology, comprehensive quality, close customer relations and marketing
- **Concentration:** On exclusive Products and markets where *Hilti* is or could become brand leader

*Hilti* sells its products via four distribution channels to satisfy customer needs: Direct sales, call center, *Hilti* center and internet. With these channels they reach about 200,000 customer contacts per day. Due to this close customer relationship they found out, that products are most important for one-third of customers closely followed by services which add additional value. [cf. HiFm 11, p. 105-107]

Within this business model, *Hilti* does not distinguish between direct sales and contract based fleet management. To show the difference between both concepts it is necessary to compare the old (direct sales) and the new (fleet) concept in a framework which models the company and its processes in detail. [HiltiExp 12] Therefore the situations before and after the fleet management introduction are build up into the developed business model from chapter 3. The following table 3 shows the results of the comparison.

**Tab. 3: Main differences in the main business model subcomponents**

<b>Component</b>	<b>Classical model</b>	<b>Fleet model</b>
<b>Sustainability</b>	Short-term orientated	Long-term customer contracts, products belong to <i>Hilti</i> and they can recycle them
<b>Pricing</b>	Pay for the whole product / service at once	Monthly payment
<b>Service</b>		Additional service (see chapter 4.1)
<b>Customer Relationship</b>	Primary close contact to the foreman at the construction area	Primary contact to the management
<b>Target Customer</b>	Everybody who can afford the products	Financially strong companies for a long-term relationship
<b>Partners</b>	Customary in the line of business	Additional logistical and financial partners
<b>Product &amp; Service Flows</b>	Buy – use – repair – dump	Lease – use always functional products
<b>Capital Model</b>		More capital resources spent in products
<b>Revenues</b>	Sold products & services per sale	Monthly leasing rates
<b>Marketing</b>	Product demonstration at the construction area	Convince with service advantage
<b>Legal Aspects</b>		New challenges e.g. leasing laws

### 4.3 Conclusion

*Hilti* is one of the leading enterprises in the construction industry worldwide. They develop, produce and dispose high technological products like tools, installation systems and construction equipment. The traditional way of selling those products is by direct-sales at the construction area, via call-center, *Hilti* center or the internet. Considering only the cash value, tools have less priority for big companies. To increase the benefit of those products *Hilti* offers a range of services like calibration, planning or repairing.

A special service innovation is the “fleet management” concept which was introduced about ten years ago. The customer does not buy the tools; the customer is just renting them for a constant charge per month. *Hilti* remains the owner of those tools and takes care about the whole administrative part like maintenance, repairing and logistics. In fact they created a kind of a new business model to establish a long-term relationship between *Hilti* and the specific customer and increased their importance for them.

## 5. eMobility

Until 2020, the federal government of Germany intends to have a million electric cars on road. In order to achieve this ambitious goal, currently just 4.541 (status December, 2011) electric cars can be found on German roads, an innovative business model must be created and established [cf. Rand 12]. During this project excessive research regarding the current status of eMobility and eVehicles in general has been made.

The main question to pose is – who needs an electric car for which purpose? This question cannot be answered easily! There are too many factors which influence the outcome. Not only for instance the trends of gas-, oil- and electricity prices have a significant impact on the success for eMobility. For this reason this analysis is stopped at this point while considering that a well defined goal is set. The long-term goal must be eMobility.

In principal the future target market contains all those who are driving a conventional powered car today. Beginning with this consideration the developed concept of this paper shows a way to spread the share of electric cars in Germany.

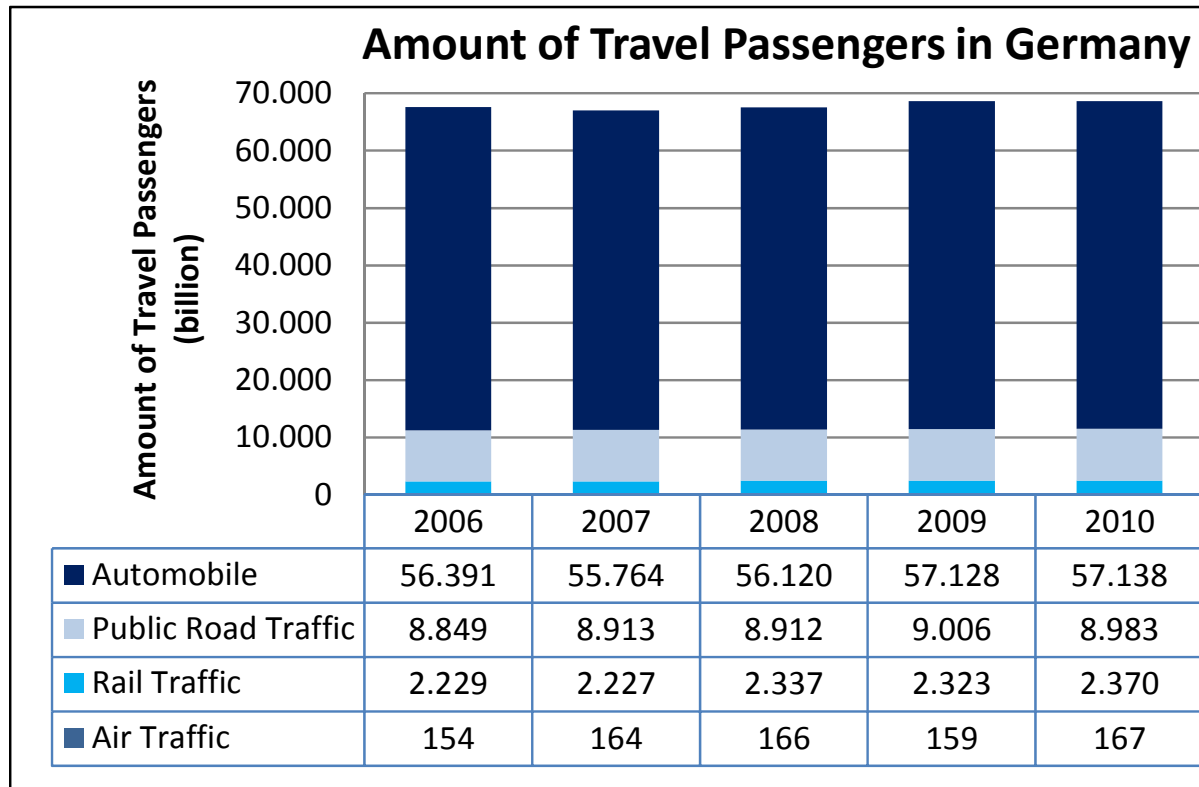
Considering that at the moment only 0.1% of all cars on German roads are eVehicles it becomes clear very soon that one possible strategy to implement eMobility in Germany does not meet necessarily the objective. Means to increase the popularity of eMobility have to be analyzed. Strategies to get eVehicles on the street fast and noticeable, for large groups of people, need to be formulated. People need to see that eVehicles can be an alternative to conventional driven cars already today.

Considering the above mentioned facts the outlined business model analyses the possibility to increase popularity of eMobility. The strategy is to design a possible business model for a taxi company which increases the propagation of electric cars, makes effective advertising for them and tests different technologies on the road. Therefore the proposal is to start eMobility with taxis in large cities.

Before the formulated business model and the components necessary for the implementation are presented, some general facts about eMobility and the market coverage of taxis will be introduced in this chapter including further opportunities that arise from this solution.

## 5.1 Analysis on eMobility

Today most people reach their destination by car. Believing most forecasts human habits of traveling will not change. Possible competitors of the car in general are air traffic, rail traffic and public road traffic. The amount of passengers between 2006 and 2010 can be obtained from Fig. 9.



**Fig. 9: Amount of travel passengers in Germany [cf. StatBu 12]**

These means of transport are competitors of electric cars in the wider range. Looking at different technology solutions, eMobility has various competitive propulsion technologies. The pros and cons of the most important technologies are illustrated in the following table 4.

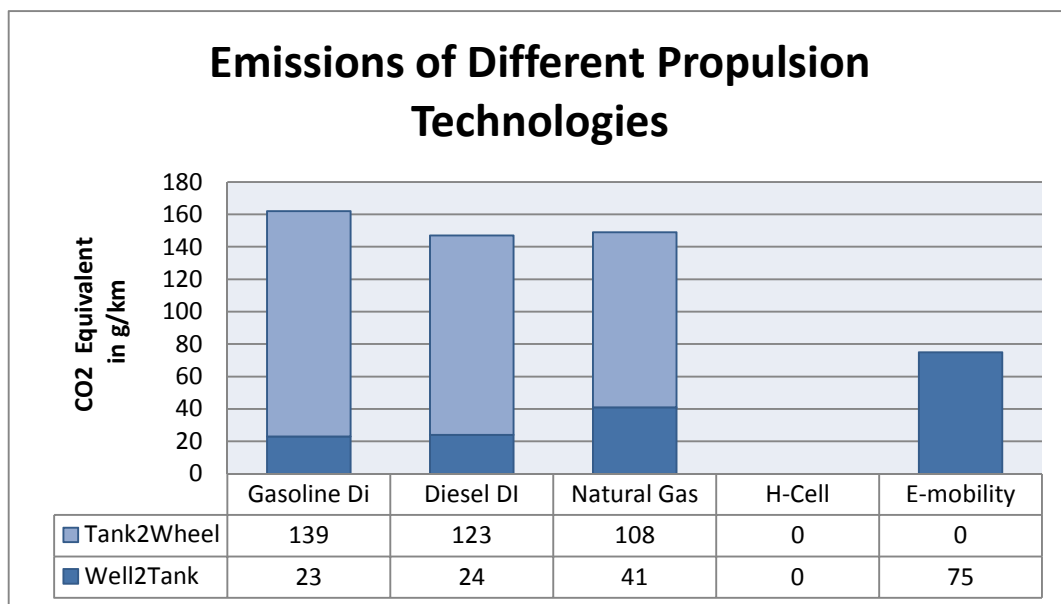
**Tab. 4: Propulsion technologies and important characteristics [cf. Focus 09; Lang 12; Bure 09]**

Propulsion Technologies	Characteristics	Pros	Cons
<b>Conventional</b>	Diesel, gasoline car engine, natural gas engine	Existing infrastructure Accepted in society Long outreach (up to 900 km) Powerful engines	Poisonous emission Efficiency
<b>Fuel Cell Hybrid Electric Vehicle</b>	Electric engine which has an H-Cell for energy supply	Good efficiency Low or no emissions, if hydrogen is provided through renewable energies Silent automobiles	Fuel storage Poor infrastructure Outreach (up to 200 km)
<b>Hybrid Electric Vehicle</b>	Conventional engine combined with an electric engine	Low emissions Powerful engines	Expensive

Regarding the mentioned technologies in detail it becomes clear that new propulsion technologies save emissions if their energy supply is provided through renewable energy. That is the main reason why they emit less CO<sub>2</sub> as a conventional automobile. E-Mobility seems to be “without emission” which is why e-Mobility is revived lately. [cf. Herz 12]

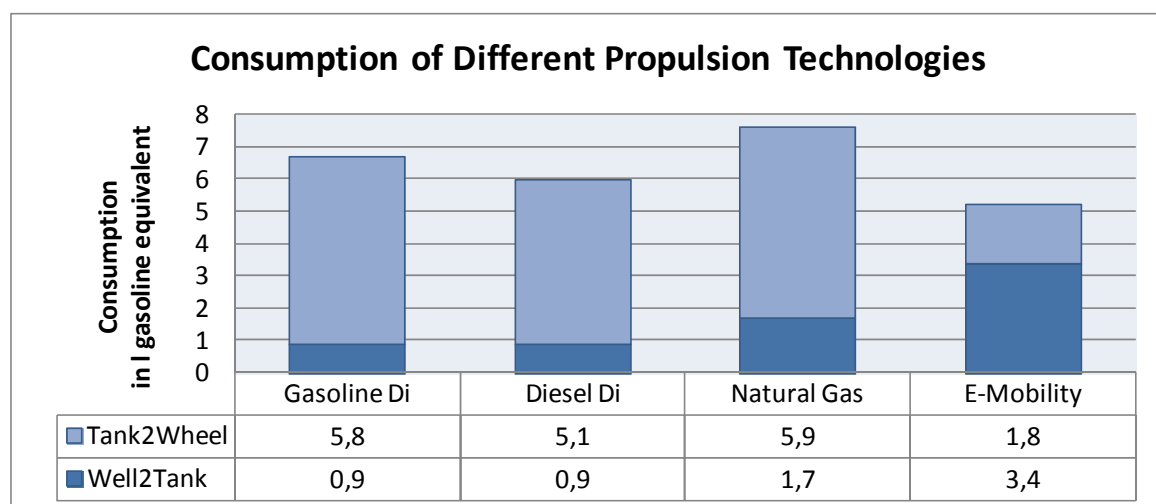
In order to make a representative statement of propulsion technologies more than a tank to wheel analysis which regards only emissions and consumptions needed during car utilization is necessary. More convincing is the analysis about emissions and consumptions which considers all of them starting at the well and ending with utilization. This approach is called “Well2Wheel” analysis and is the result of “Well2Tank” and “Tank2Wheel”. This analysis is shown in Fig. 11 and Fig. 12 and compares emissions and consumptions of different propulsion techniques. [cf. Chou 02]





**Fig. 10: Emissions of different propulsion technologies [cf. Daim 10]**

Figure 12 shows that an electric automobile by itself seems to emit nothing else as “fresh air” and conventional cars are worse polluters. This would be the ancient way of measuring automobile emissions, the Tank2Wheel study. A more detailed look shows that eMobility is cleaner as the conventional propulsions but still emits greenhouse gases, considering a Well2Wheel analysis. According to the study of Daimler the automobile industry could save about 50% of greenhouse emission, if all cars would be electric cars.



**Fig. 11: Consumption of different propulsion technologies [cf. Daim 10]**

The behavior of the consumption corresponds to the emission. Examining Fig. 11 the consumption of an electric automobile is similar to the consumption of a conventional car. The regular consumer would not notice the difference, because consumers are

generally focused on consumption and its costs – Tank2Wheel. Considering just this consumption, electro mobility would drop it by two-thirds or even more. The Well2Wheel analysis shows that eMobility has advantages compared to the conventional propulsion although not as big as expected before the Well2Wheel analysis. The savings compared to a gasoline driven car add up to 22 percent. Up to that point, it can be summarized that greenhouse emissions and energy could be saved while using electric cars.

Retrospectively electro mobility is little news. First electric car on the road was the tricycle of *Ayrton* and *Perry* in 1881 which reached ranges of 40 kilometers. Reasons why electro mobility was not established were little range, complex way of charging batteries and capacity of batteries. [cf. Vieh 12]

To get an impression of the potential of eMobility in Germany, the established method is the SWOT analysis which illustration shows today's strength, weaknesses, opportunities and threats (see Tab. 5). [cf. Bure 09]

**Tab. 5: Potential and issues of eMobility**

<b>SWOT Analysis on eMobility in Germany</b>	
<b>Strength</b>	<b>Weaknesses</b>
<ul style="list-style-type: none"> <li>• Top position in automotive, propulsion technology, power electronics, renewable energies, industrial and communication technology</li> <li>• Dynamic development of renewable energies</li> <li>• Modern infrastructure and high technical standard of energy supply mains</li> <li>• Competencies in important high-tech research and development of complex system technologies</li> <li>• High potential of innovating new technologies</li> <li>• High environmental awareness</li> </ul>	<ul style="list-style-type: none"> <li>• Production of battery systems is not established yet</li> <li>• Capability of development in research on battery systems and referring education</li> <li>• Less experience with these technologies</li> <li>• Little cooperation between automobile industry, energy suppliers and battery manufacturer</li> <li>• High costs for battery</li> <li>• Lack of norms and standards, e.g. interfaces between automobile and charging infrastructure, security aspects and testing and measuring methods</li> </ul>

## SWOT Analysis on eMobility in Germany

### Opportunities

- Germany as market leader in electro mobility
- Dependency on oil is reduced and maintenance is secured
- Human mobility is assured in long term
- Climate protection and reduction of emissions
- Improvement of the grid, e.g. through effectiveness and mobile storages

### Threats

- High demand of investments
- Restrict access to key technologies concerning battery systems
- Isolated applications could interfere market penetration
- Dependency and availability of raw material could slow down growth
- Acceptance of electro mobility
- Costs
- Range
- Security

## 5.2 Facts about the German Taxi Environment

Nearly 50,000 taxis are driving on German roads at the moment. The three biggest cities of Germany Berlin, Hamburg and Munich are already covering 28% of all taxis. Also the concentration of taxis in those cities is very high with around 500 citizens per taxi. [cf. BZP 11, p. 90, 95] Detailed data is shown in the table below:

**Tab. 6: Data for passenger transportation in German major cities**  
[cf. BZP 11, p. 93]

	Citizen	Sum of cars	Citizen / car	Sum of taxis	Citizen / taxi
<b>Berlin</b>	3,416,255	1,088,221	3.14	7,065	484
<b>Hamburg</b>	1,770,629	711,450	2.49	3,377	524
<b>Munich</b>	1,368,840	593,920	2.30	3,402	411

At the moment the following taxi fare consists of a basic price and a price per kilometer which is shown in the following table:

**Tab. 7: Taxi prices in German cities [cf. BPZ 11, p. 89]**

City	Basic price	Price in € per km	Effective
<b>Berlin</b>	3.20	0 - 8 km: 1.65 €/km > 8 km: 1.28 €/km	01.07.2009
<b>Hamburg</b>	2.80	0 - 4 km: 1.93 €/km 5 - 10 km: 1.83 €/km > 11 km: 1.34 €/km	01.08.2011
<b>Munich</b>	3.30	0 - 5 km: 1.70 €/km 6 - 10 km: 1.50 €/km >10 km: 1.40 €/km	01.12.2010

The following part shows an example price calculation for a single-shift-operation in Munich in the year 2011.

**Tab. 8: Extract of a balance sheet: single-shift-operation Munich, 2011**

[cf. BPZ 11, p. 85]

	2010	2011	Ratio 2010 / 2011	
Driven kilometer	39,400	39,400	+/- 0%	
Gross revenue per kilometer	1.09	1.13	+ 3.7%	
<b>Gross earnings</b>	<b>42,946</b>	<b>44,522</b>	<b>+ 3.7%</b>	
<b>Fixed costs</b>	Write-off AfA	5,188	5,236	+ 0.9%
	Interest on capital	931	933	+ 0.2%
	Insurances	5,556	5,730	+ 3.1%
	Car tax	340	340	+/- 0%
	Charges for radio & telephone	1,016	1,016	+/- 0%
	Others (administration, rents, etc.)	2,689	2,763	+2.8%
	<b>Total fixed costs</b>	<b>15,720</b>	<b>16,018</b>	<b>+ 1.2%</b>
<b>Variable costs</b>	Fuel costs (10l diesel / 100km)	4,019	4,689	+16.7%
	Diesel average price	1.02	1.19	+16.7%
	Tires	444	440	- 0.9%
	Repair & maintenance (3,27€ / 100km)	1,288	1,288	+/- 0%
	Engine oil (1l / 100km, 9,29€ / liter)	183	183	+/- 0%
	Car care	409	409	+/- 0%
	<b>Total variable costs</b>	<b>6,343</b>	<b>7,009</b>	<b>+10.5%</b>

The interpretation of the balance sheet shows, that the fuel costs have a share of 20% of the whole costs. Since this factor has increased dramatically in the last years the impact of fuel costs will rise in the future.

### 5.3 Design of the Business Model

The basic idea behind this paper is to develop a business model as described in chapter 3 for the taxi trade. The aim is to increase the propagation of electric cars, make advertising and test technology in the field. Seen from a theoretical perspective a conventional powered taxi is just being replaced by an electric one. Eventually this idea is much more complex. To run eTaxis effectively, many different aspects have to be considered. Besides the car, a battery and a loading structure are needed. Thinking of sustainability the electricity should be generated from 100% renewable energy sources. Furthermore the employees of those taxi firms would not only act as drivers, but be responsible for the passenger advertisement. Introduction of those “green transport vehicles” in big towns is also interesting for the city administration and the government.

The **strategy** of the business model now defines the means of how to implement the basic idea of an electrical taxi company. The goal of the strategy is to reach a market share of 10% of all taxis in Germany by 2020. The vision is to make a huge step in the matter of environmental protection by providing the same services as a traditional taxi company with fewer emissions and maybe even a cheaper price. Therefore the culture of the company should be ecosensitive, open-minded for changes and innovative. The business model is designed as a joint venture or other cooperation between an Original Equipment Manufacturer (abbreviated with OEM) and a battery supplier.

The business model includes different **value propositions** for the different stakeholders which can be obtained from table 9.

**Tab. 9: Different value propositions for stakeholders**

Value propositions for main stakeholders	
<b>OEM</b>	<ul style="list-style-type: none"> <li>• Distribution of 500 equivalent eVehicles (equipment, performance, etc.)</li> <li>• Testing of technology in the field (GPS-tracking, live-tests, etc.)</li> <li>• New customer segment (taxis)</li> </ul>
<b>Battery supplier:</b>	<ul style="list-style-type: none"> <li>• Distribution of 500 Batteries at once</li> <li>• Testing of technology on the street</li> </ul>
<b>Passenger:</b>	<ul style="list-style-type: none"> <li>• Same services with less emissions and less noise</li> <li>• Cheaper prices</li> </ul>

In addition the OEM, the battery supplier and even the electricity distributor get free advertising showing their logos on the car.

To define **financial aspects**, including the cost structure of a taxi firm, analysis have to be made about the costs and changes of using electricity instead of fossil fuels. It is assumed that the introduction of 500 eVehicles in Berlin, Hamburg and Munich would generate total costs of 10.2 million € per year. The following cost estimation is based on the balance sheet (see table) and assumes that economies of scale can be used since 500 cars are demanded at once. The cost estimation replaces costs for diesel fuel with cost for electricity. It includes all costs for taxis and salaries for the drivers. Not included are transaction costs, marketing costs and salaries of managers which are negligible since the resulting costs per kilometer are only 0.52€/km and the cheapest taxi fare is about 1.28€/km plus an addition of 3.20€ (Berlin) at the moment (See table 10).

**Tab. 10: Analysis of the cost structure****Cost estimation for one year**

<b>Assumptions:</b>	
Number of taxis:	500
Driving km/year/taxi:	39,400
Battery leasing:	50€/ month
Electricity consumption:	14kWh / 100km
Electricity price:	0.26€/ kWh
<b>Electricity costs/taxi/year:</b>	<b>1,434.16 €</b>
(39400/100*14*0,26)	

<b>According to balance sheet for 1 taxi:</b>	
Fixed costs:	16,018.00 €
Variable costs:	7,009.00 €
- Diesel:	- 4,698.00 €
<b>Cost per taxi (without fuel):</b>	<b>18,329.00 €</b>

<b>Accumulated costs for 500 taxis:</b>	
Cost of taxis:	9,164,500.00 €
Battery leasing:	300,000.00 €
Electricity:	717,080.00 €
<b>Needed capital per year:</b>	<b>10,181,580.00 €</b>

<b>Price per km (only cost based):</b>	<b>0.52 €</b>
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Like shown in chapter 3 the brand, competencies & capabilities, people and the right usage of technology are all important **resources**. Branding is important for the taxi business model because the taxi is also a “driving billboard”. The logos of the business partners (OEM, battery supplier) appear on the side of the taxi. In addition the logo of the electricity supplier is shown on the taxi in order to show that 100% renewable energy is used to operate the electrical taxi. The taxis have a distinctive design with a high recognition value to promote eMobility in general.

To make a positive impression not only the design of the taxi is important but especially the driver. In this business model the driver does not only drive the taxi but also promotes it. The drivers get special training about eMobility so that they are able to answer all possible questions customers may have about the “green taxi” and eMobility in general. Possible questions could be:

- How far can you drive?
- How and where can you charge the taxi?
- How much does an eVehicle cost?
- How fast can you drive?

The background is that by talking about the car customers realize that eMobility is not a technology of the future anymore but can already be used today. In addition the taxi drivers report their impressions of the field behavior of the eVehicle back to the OEM. Thereby the OEM can analyze and evaluate the potential of the eVehicle and can address possible problems.

Technology is one of the “hidden” key resources of this project. In fact the cars should be state of the art and rich of innovations and interior to impress the passengers during their rides. The battery and the charging technology must be competitively viable against the common conventional technologies. In order to provide a range of approximately 200 km per day the charging method has to be very fast (about 30 min). The drivers must be able to fill up their cars during lunch break while using “fast charging stations” as they are already provided by several vendors like E.On or Siemens.

The most important **processes** in the business model are marketing and logistic. To “sell” the proposed business model to the necessary parties (OEM, battery supplier, etc.) individual marketing strategies have to be formulated for each player. All factors

of the logistical stream have to be analyzed comparatively for each party in order to reduce transaction costs as far as possible. For example it has to be defined how assembly processes can be linked best.

The **environment** of the business model is formed by legal aspects, competitors and most important: stakeholders. Currently within the first five years after registration no taxes apply for electrical cars which results in cost savings of 170,000€ (340€ per year and per taxi). Since Germany is far away of reaching its goal of a million electric cars until 2020 it is assumed that further subsidies or payments regarding this topic will be made.

As shown in chapter 5.1 in the broader sense all alternative means of transportation are competitors (the automobile, public road transport, etc.) for the taxi industry. In the narrow and more important sense conventional taxi companies are the competition. For this reason it is very important to offer the proposed alternative of “emission free taxi driving” at the same price as conventional taxi driving.

Most important stakeholders are the states which wants to fulfill the quota of electrical vehicles and communities or cities which benefit from lower emissions in their area. They have the ability to build up “fast charging systems” and reserve them for eVehicles and therefore improve their infrastructure.

Thinking about **networks & channels** the question is: Who are the suppliers, partners and what are the product and service flows between them? Since this business does not manufacture goods there are no product flows. The most important aspects about **networks & channels** are how to define the cooperation between OEM, battery supplier and the taxi company best, who bears which costs, who carries the risks and what kind of organization will be found. It has to be answered if one party is the main operator or if all parties are included equally. An electricity distributor for example acts as supplier and provides the renewable electricity for the charging stations.

Regarding the **customer & market scope** of the business model, the target group is all people who use taxi services. For this business model there is no need to differentiate between different customer segments since there is no different value proposition. In the short- term view everyone who urgently needs to reach a destination in the proximity of the town is a customer. In the long-term view all inhabitants of Ger-

many are potential customers. The value proposition for each party is “emission free” taxi driving at the same or even a cheaper price. The target markets are the previously introduced cities (Berlin, Hamburg, Munich) which have a high taxi concentration and a large population. An additional factor for choosing those cities was that they are all popular for German and International tourists, which again helps to raise awareness for eMobility.

The following table provides a possible solution of the business model for an electrical taxi company including all components and their functions and therefore summarizes the detailed design of the business model.

**Tab. 11: Designed business model for eMobility**

Business Model for an electrical taxi company (1/4)			
<b>Strategy</b>		Mission & Vision	<ul style="list-style-type: none"> <li>✓ A huge step for the environment but a small taxi ride for you</li> <li>✓ 10% share of taxi market in Germany until 2020</li> </ul>
		Structure	<ul style="list-style-type: none"> <li>✓ Employees have to identify with product, they have to know about investors, electric propulsion and renewable energy</li> <li>✓ Smart appearance of employees, they receive trainings</li> <li>✓ Small hierarchies</li> </ul>
		Culture	<ul style="list-style-type: none"> <li>✓ Eco sensitive</li> <li>✓ Open minded for changes</li> <li>✓ Innovative</li> </ul>
		Sustainability	<ul style="list-style-type: none"> <li>✓ Reinvestments in additional taxis</li> <li>✓ Part of profit is invested in renewable energy and “filling stations infrastructure”</li> </ul>

Business Model for an electrical taxi company (2/4)		
Value Proposition	Product	✘ Service is offered
	Service	<ul style="list-style-type: none"> <li>✓ Resource-efficient transport</li> <li>✓ Slight emergence of noises, only the noise of tires and electric motor</li> <li>✓ Emission-free transportation in towns, inhabitants will be satisfied because no particulates will be emitted</li> </ul>
	Pricing	<ul style="list-style-type: none"> <li>✓ Costs per km need to be less or equal to price of conventional taxis in town</li> </ul>
Financial Aspects	Cost Structure & Capital Model	<ul style="list-style-type: none"> <li>✓ Depending on cooperation between involved parties</li> <li>✓ Possibilities:                             <ul style="list-style-type: none"> <li>• Energy supplier supports renewable energy for a special price</li> <li>• Towns support infrastructure of electric filling stations</li> <li>• State gives money to reach the goal of one million electric cars in 2020</li> </ul> </li> </ul>
	Revenue	<ul style="list-style-type: none"> <li>✓ Fare = charge per kilometer</li> <li>✓ Subsidies which are received of the state and/ or community</li> </ul>
Networks & channels	Suppliers	<ul style="list-style-type: none"> <li>✓ Electricity distributor</li> </ul>
	Partners	<ul style="list-style-type: none"> <li>✓ OEM</li> <li>✓ Battery supplier</li> </ul>
	Product & Service Flows	<ul style="list-style-type: none"> <li>✓ Battery – OEM – City</li> <li>✓ Training – Driver – Customer</li> </ul>

Business Model for an electrical taxi company (3/4)		
Resources	Brand	<ul style="list-style-type: none"> <li>✓ Design with brand recognition value</li> <li>✓ All brands of partners are represented on car</li> <li>✓ Special, remarkably logo and appearance of the taxi</li> </ul>
	Competencies & Capabilities	<ul style="list-style-type: none"> <li>✓ Taxi drivers gain trainings about eMobility, renewable energy, energy supply and special features of the car</li> </ul>
	People	<ul style="list-style-type: none"> <li>✓ Employees are aware of their deploy</li> <li>✓ Employees make advertisement for eMobility and partners</li> <li>✓ Employees are open-minded and communicative</li> <li>✓ Must provide comfortable atmosphere</li> </ul>
	Technology	<ul style="list-style-type: none"> <li>✓ Fillings stations need to load taxi very fast (about 30 min), need to be able to run 200 km per day (39,400 km each year-see table)</li> <li>✓ Cab drivers run into electric filling stations after dropping of their passengers or in their lunch break, therefore various filling stations need to be established, e.g. at main train stations</li> </ul>
Processes	Marketing	<ul style="list-style-type: none"> <li>✓ Different marketing strategies for the customers and suppliers</li> </ul>
	Logistical Stream	<ul style="list-style-type: none"> <li>✓ Has to be defined for all processes between involved parties</li> <li>✓ Depends on technology and form of cooperation</li> </ul>

Business Model for an electrical taxi company (4/4)		
Environment	Legal Aspects	<ul style="list-style-type: none"> <li>✓ No taxes for electric cars in the first five years after registration date, KraftStG 9 (2)</li> </ul>
	Competitors	<ul style="list-style-type: none"> <li>✓ Conventional Taxi drivers,</li> <li>✓ Local public transport systems (bus &amp; train) and</li> <li>✓ Car sharing</li> </ul>
	Stakeholder	<ul style="list-style-type: none"> <li>✓ State which wants to fulfill the quota of one million electric vehicles until 2020</li> <li>✓ Communities that can improve their location</li> <li>✓ German inhabitants which care about environment</li> </ul>
Customer & Market Scope	Customer Relationship	<ul style="list-style-type: none"> <li>✓ Idea for further development: Enduring relationship to customers through a "Cabcard" which can be acquired by a monthly purchase, like that common eTaxi users are able to save money – in comparison to "BahnCard" of "Die Bahn"</li> </ul>
	Target Customer & C. Segments	<ul style="list-style-type: none"> <li>✓ Short term view: everyone who urgently needs to reach a destination in the proximity of the town, like that customers come in contact with eMobility and start to concern about this topic and its influences</li> <li>✓ Long term view: all inhabitants of Germany are potential customers</li> </ul>
	Target Market	<ul style="list-style-type: none"> <li>✓ Starting in big cities where you can reach many people because of high density of population and then propagate to others</li> </ul>

## 5.4 Forecast

eMobility is an interesting and necessary topic in the present and in the future. Thinking about the forecast, there are several aspects, thousands of single parts (e.g. price trends, technology, environment effects, infrastructure, etc.) that need to be analyzed. Therefore this chapter concentrates only on the outlook of the introduced business model, assuming a commercial success in the future:

- Initially, the share of eTaxis should be increased in the mentioned cities and the business model should be transferred to other cities like Frankfurt, Cologne, etc.. Since nowadays the whole taxi segment only consists of about 50,000 cars (see chapter 5.2) this option might not be so fascinating.
- At the moment taxi fares in Germany are in the opinion of most people too expensive. Compared to other countries less people use taxi services. The more taxis are introduced in general the more economies of scale can be used and therefore prices for taxi rides can be reduced. The aim is to lower the taxi fare in such an extend to motivate non-consumers to use the offered service as well.
- Another interesting area is the rental car business. The best promotion for any product is testing it yourself and getting convinced while using it. This market segment has a growing future, thinking on “car sharing” and “pay-per-use” models in the broad sense.
- To enlarge the customer bond a customer card for the taxi company can be introduced. The so-called “CabCard” works like the card of “Deutsche Bahn”. Customers pay a monthly fee and in return need to pay a lower taxi fare which binds the customers to the taxi company and increases the taxi-service usage.
- To increase the share of eVehicles in the field further the cars used as taxis will be sold after one year and replaced by new ones. Therefore each year the number of eVehicles in the field will double.

## 6. Conclusion

The created business model for eMobility describes a possible solution to approach the ambitious aim to introduce 1,000,000 eVehicles in Germany until 2020. In fact the concept does not try to establish this high number of cars in Germany; instead it suggests increasing the propagation of them and make effective advertising. Therefore at least 500 eTaxis should be placed in Berlin, Hamburg and Munich. The investment costs are approximately about 10 Million € per year, assuming a good agreement with an OEM and a battery supplier. The taxi drivers have a central role and also act as “salesmen” for the green technology, considering that the electrical energy is produced by renewable sources. They promote the technique and answer passenger’s questions about eMobility and environmentalism. This kind of advertising is a good argument for special benefits offered by the partners. Since the idea is really interesting for other stakeholders, for instance the city administrations and the government, the potential of the project is quite high. Regarding this fact “fast charging stations” could be build by the government to support the business model among further subsidies. In the future the business model could be extended by starting a new approach in the rental car business, while increasing the taxi numbers at the same time.



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