

# Coping with change: the case of EV manufacturer

A Master's Thesis submitted for the degree of  
"Master of Business Administration"

supervised by  
Mgr, PhD Jan Uriga

Vadim Sebeykin

1426641

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## Affidavit

I, **VADIM SEBEYKIN**, hereby declare

1. that I am the sole author of the present Master's Thesis, "COPING WITH CHANGE: THE CASE OF EV MANUFACTURER", 65 pages, bound, and that I have not used any source or tool other than those referenced or any other illicit aid or tool, and
2. that I have not prior to this date submitted this Master's Thesis as an examination paper in any form in Austria or abroad.

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Signature

# **1. INTRODUCTION**

## **1.1 Introduction**

No organization has change immunity. Global environmental pressures are pushing the current internal combustion engine (ICE) vehicles to their technological limits. Historical development of the automotive industry is likely to be discontinued and transform into a new form within a reachable timeframe (2025-2030) (KPMG 2016). Most automotive companies will be challenged by disruptive changes in their competitive environment in the next 5 years. The rising Electrical Vehicle (EV) segment sets the pace of change with disruptive innovation. Under these dynamic and disruptive conditions contemporary automotive managers need to answer many questions, solve numerous choices, decide on various trade-offs, act on opportunities and minimize risks that are all induced by change.

There is one familiar approach to change that confronts it as a challenge to the established exploitative position and stability. The adept companies follow organized structure, preset processes, defined roles assignment, and prescribed rules. Such companies tend to decrease variance, their corporate architecture and operations are modelled to promote efficiency, and risk-reduction as mechanisms for achieving their planned goals and objectives, maintaining the high-level of service predictability and reliability. This approach dominates many mass-production industries and automotive sector as such and performs well on mature markets and in stable environments, where the rate and the degree of changes are low. The side effects of this organizational coherence and internal fit focus consist of the firm's tendency to be focused on their past best performance and substantial inertia to pursuit some new business opportunities. This business approach type is also prone to limited cost-effectiveness and mediocre performance during rapid changes and crisis cycles (e.g. in 2008-2009).

The second alternative is the explorative business model approach, which is characterized by enhancing innovative change, increased customer focus, flexibility, creativity, responsiveness and differentiation. It is achieved through concentrating on leadership, combinatory usage of resources, capability optimization, experience and self-learning. This approach suggests more functional-relational instructions, strategic alignment, and managers' decision-making tolerating higher risks and

uncertainty. It is particularly useful when applying the generic business models on a global map where the environment conditions are different or at times of global uncertainty and rapid change.

**Motivation:** The topic of EVs development and market is critical for the automotive industry, it has personal importance and it is vital for our global community as well.

**Actuality:** Change is happening here, right now.

**Effect:** We are all witnessing this change, it is pervasive. Tomorrow will be different.

Opening this discourse about the changes in the automotive industry and EVs we should think of one special company. Even though EVs and battery storage technology had been around throughout 20<sup>th</sup> century, as for me, it was Tesla that had changed the common perspective about EVs from something ‘mediocre, not serious’ to premium class vehicles and had started the path of global EV growth and the transformation of mobility.

## **1.2 Approach formulation**

This Thesis intends to study a firm’s adaptive and innovative reaction to change.

The study will focus on the specific business model features, components, value, and their interrelationships. Two main strategical modes related to change are formulated as:

- a) productivity (exploitation and optimization pattern);
- b) growth (value creation, exploration and innovation pattern).

*Growth (innovation)* and *productivity (efficiency)* are both the founding principles of the automotive industry and it is viable to study their interaction in a dynamic context. The study hypothesizes which mode is fit for the dynamically changing environment with respect to the globally growing EV market. The study should provide the following results:

- a) Selection of the appropriate analysis framework;
- b) Identification of the key trade-offs;
- c) Formulation of managerial choices and contingencies.

### 1.2.1 Problem formulation

The automotive industry heads into disruption. Some analysts (Ford 2017) report that the automotive industry *already witnesses disruption and uncertainty*. FISITA World Automotive Summit in November 2016 had suggested these three categories of the most potential disruptive challenges:

- societal needs;
- complexity;
- commoditization of mobility

Within these categories the summit participants have particularly mentioned such specific areas as the talent gap, the speed of change, new competition, maximizing the mobility asset and transportation being used as a service (FISITA, 2016). Global markets are impacted by complexity and uncertainty. These changes have long-term consequences for the EV manufacturers that need to adopt their strategies to such outcomes and innovate their business models accordingly. The consumers also rethink their priorities and values. The abundance of alternatives and longer payment obligations make customer choice difficult, decrease ownership commitment and frequently endorse *using over buying*. As a consequence, the companies have to develop and refine their models for value creation, value delivery and capture (Teece, 2017).

Conceptually this Thesis identifies three key unresolved dilemmas (or trade-offs):

- a) Change approach: Threat vs. Opportunity
- b) Choice of contingency to change: Adaptation vs. Innovation
- c) The type of adaptive alignment: Context flexibility vs. Internal alignment.

The work hypothesizes that the optimal adaptive organizational response to the dynamically changing environment is achieved by using a model and employing the established change-related contingencies. The change response is usually formatted into decisions on strategic or tactical levels. Among some other possible strategic management tools, the Business Model approach had been advised as the proper framework for addressing such problems as disruption, complexity or changing values (Hamel 2000, Teece 2010). Key trends, industry forces, macroeconomic forces, and market forces were seen as the BM design enablers or design constraints (Osterwalder & Pigneur 2010:201). However, there is still a non-adequate empirical

connection of the Business Model framework with the practical cases in the automotive industry. This Thesis intends to overcome some of these deficiencies and provide the managers with the set of answers and contingencies to their vital questions.

### **1.3 Thesis design**

The theoretical part (Chapter 2) initially confronts the problem through different theoretical lenses and the change-related concepts, and the most appropriate conceptual framework is further selected.

The research part (Chapter 4) is facilitated through a case-study format. The subject of this research is the automotive company, which is studied on a basis of its business model. There is a specific qualitative examination of the adaptive and innovative change contingencies and systemic effects in a firm's business model, the assessment of value propositions, and the explanation of the customer perceived value (CPV) deviation measurement.

Interpretations and implications are discussed in Chapter 5.

The practical use of this research arises from the study's applicability for the EV manufacturers. It should enable automotive managers to effectively adapt and innovate their business models in a changing context and in disruptive environments.

### **1.4 The Research Questions**

Based on the study context and investigating the adaptive firm's change response this Thesis raises the following research questions:

**Research Question 1 (RQ1):** What if the automotive companies will be challenged by major disruptive changes in their core competitive environment in the next 5 to 10 years, then how we can define the possible counteraction choices and the reflections to their BM components?

**Research Question 2 (RQ2):** If we define the key managerial trade-off affected by change as a choice between:

- **Exploitation** (productivity, cost focus, optimization & standardization pattern)

and **Exploration** (value creation, growth and innovation pattern), which of the above patterns provide competitive advantage for the observed context (the proliferation of EVs and some related developments in the automotive industry)?

**Research Question 3 (RQ3)** When we identify two of the following optional responses to environmental change as **adaptation and innovation** (*creation, emergence*), which one fits the given complex, dynamic, and unpredictable environmental conditions better?

#### 1.4.1 Thesis hypothesis

**Thesis Hypothesis:** The appropriate adaptive management responses for a firm in a dynamic environment are:

*Evolution, Adaptation and Innovation* of a company's business model.

#### 1.4.2 Secondary objectives of the research

This study's secondary objectives are to:

- a) Examine the change effects on business models applying exploitation – exploration (productivity-growth) dimension;
- b) Look for the key business model elements connecting a customer value and a shareholder (market) value;
- c) Identify the main strategic managerial choices and trade-offs when applying changes to a BM and suggest the optimal patterns of decision-making;
- d) Describe the importance of CVP (Customer Value Proposition) for global innovation leaders as Tesla;
- e) Explore the change-adaptive and the robust traits of Tesla's business model.

## 2. LITERATURE REVIEW

### 2.1 The concept of Change

*What is change?*

Change affects states, processes, systems, values, and just about everything.

The Oxford Dictionary provides the following definitions of **Change**:

- a) *An act or process through which something becomes different or*

b) *An alteration or modification.*

Change could be described like:

State A => Transition => Different state B.

It is continuous and the assessment of differences is done on some time frame.

*Qualitative change is a shift in characteristics, patterns of relationships, and dimensions* (Boulton et al. 2015:41). In a course of structural change there will be new emergent properties of the systems at both the micro-and macro-level. (Boulton et al. 2015:77).

Transition step is completed throughout time and in case of the radical change contains the *tipping point*.

A *tipping point* could be described as ‘a notion of a shift in regime, from one state to another, a phase shift, a point of no return’ (Boulton et al., 2015: 44).

We can differentiate by the speed of change:

- Gradual change or evolution;
- Adaptation;
- Abrupt changes.

Alternatively, we can distinguish changes by their degree: whether they are reversing or irreversible. Change is not inherently bad or good, but there are some types of change more challenging than others, this paper underlines radical and sudden change such as:

- **Radical change** happens when new features emerge and become the mainstream.

After a system has gone through a radical shift, a tipping point, new patterns of relationships and features will eventually emerge and the new situation will eventually settle down with a new underlying form. (Boulton et al., 2015: 44)

- **Sudden changes** are characterized by low predictability and/or some attention

deficits and can cause the most stress to managers.



The domain of Change Management also covers a variety of practical issues most commonly addressed by managers when they intentionally induce or sustain some change, fighting change resistance and organizational inertia.

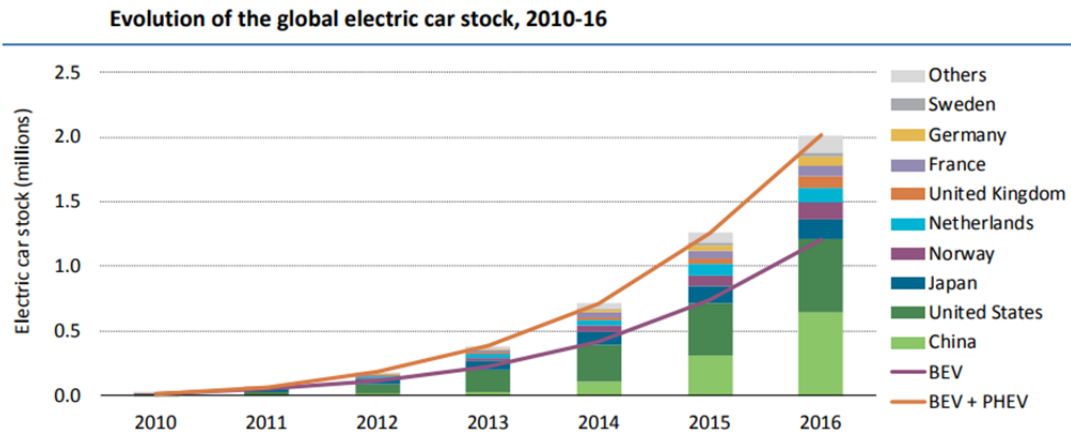
### **2.1.1 Environmental change**

Change can happen in organizations or in business markets or environment.

In the latter case, the landscape will be different, new emergent properties will arise, for example in:

- a) State legislation
- b) Consumer preferences
- c) Technological readiness
- d) EV Acceptance;
- e) Climate and nature concerns;
- f) Available EV functions and features: range, design, automation, connectivity and so on.

There are several available tools for the environmental change assessment that include PESTEL and SWOT analysis. One of the compelling signals of change in the automotive industry nowadays is the ongoing shift to electrification. We could notice the rapid increase of the EV stock in the last six years according to Figure 1 that depicts EV Growth Rates according to International Energy Agency EV report (2017).



**Figure 1** EV Stock Evolution 2010-2016 (adopted from International Energy Agency 2017)

It is not the first challenge for the automotive industry, but this time the change is aiming to revolutionize the powertrain and completely replace ICE.

### 2.1.2 Internal and External drivers of Change

| External Drivers                       | Internal Drivers                                  |
|--|---|
| Customer demands                       | Dissatisfaction with the current position         |
| Market influences (prices, valuations) | Process-system optimization needs                 |
| Competitive forces                     | Product-service innovation and evolution outcomes |
| Stakeholder interests                  | Creativity and R&D outcomes                       |
| State (EU/WTO) norms and regulations   | Value alternations, vision refinements            |

**Table 1** Internal and External drivers of Change

There is also a possibility of volatile environment changes and unpredictable adverse events. These challenges like extreme weather conditions, abrupt crises, global trade roadblocks or drastic global demographic changes are usually not specific to a company. Risk management deals with such events and trends when the risk probability is explicit. Due to low predictability of the exact timing, unknown event gravity or location they cannot be taken into the business model framework. Generally, expert prescription is to expose vulnerabilities and reduce risks where possible using cost-benefits comparison.

## 2.2 Change and Dynamic capabilities

Dynamic capabilities framework is interested in firms' own capacity building responding to their dynamic environment. This approach has originated from the resource-based view and focuses on assets allocation and prioritization of the firm's capabilities. The dynamic capabilities framework has evolved from the notion that some companies are more effective than others dealing with the changing environment showing 'timely responsiveness and rapid and flexible product innovation, along with the management capability to effectively coordinate and redeploy internal and external competences' (Teece & Pisano 1994: 537). Capabilities can be viewed as the configurations of routines and resources that allow an organization to achieve its goals, and dynamic capabilities reflect a firm's ability to reconfigure its capabilities to adapt to its environment via strategic reconfiguration (Zahra et al. 2006:7). From a company-centered point of view, dynamic capabilities operate on organizational skills, resources, and functional competences (Teece et al. 1997:515). The firm's capabilities interrelations demonstrate that dynamic capabilities are affected by and operate on substantive capabilities. (Zahra et al. 2006:17). We can deduct that dynamic capability is a set of characteristics and traits that reflect how well the firm's substantial capabilities adapt to its environment over time. The ultimate propagation of dynamic capabilities should be a firm's *ability to shape the environment itself*.

The practical importance of the concept stems from the assessment of capabilities that contribute to creation, extension, upgrading, protection and keeping relevant the enterprise's unique asset base (Teece 2007:1319). Dynamic capabilities can function as a compensatory mechanism for some dynamic industry conditions like unstable, changing context, shifting consumer demand and rapidly changing competitive situation (Knecht 2014:90). From a strategic perspective, achieving long-term success requires that firms possess not only the operational capabilities and competencies to compete in existing markets, but also the ability to recombine and reconfigure assets and organizational structures to adapt to emerging markets and technologies. (O'Reilly & Tushman 2007). In their work Prange & Verdier (2014) have exposed the dual nature of dynamic capabilities by outlining *threshold* and

*consolidation* capabilities related to exploitation (survival) mode as well as *value-adding* and *disruptive* capabilities related to exploration (growth) mode (Prange & Verdier 2014: 127)

James G. March contributed to our theoretical understanding with the dichotomy of **exploitation/exploration** in organizational learning and response to change. He has advised to distinguish *exploitation* focus (related to refinement, implementation, efficiency, and production) in contrast to *exploration* focus (that strives for adaptive mechanisms that require experimentation, variation, search, and innovation) (March 1991). Logically, exploitation is concentrated on the existing markets and customers, and in exploration mode companies invest their resources seeking new knowledge, developing their novel products, expanding to new markets and looking for some new customers. Looking at evolutionary parallels there are also two visible functions for all organisms: *sustain (keep)* which is responsible for survival; and *growth (spring)* related to dynamic activities, risk taking and future growth.

Firms need to balance these two approaches, as great imbalances towards exploration mode will lead to extra costs of experimentation without gaining many of the benefits (March 1991:71) while the opposite skewedness to exploitation will lead to underperformance in terms of value creation or future cash flows. The latter discussed concept of **Ambidexterity** attempts to deal with this problem.

### **2.2.1 Dynamic Capabilities and Business Model implications**

Dynamic capabilities are reflecting the company's ability to adopt its business model to the changing market competitive conditions. Dynamic capabilities can relate to strategic fit concept, coined by Porter. Dynamic capabilities approach is helpful in overcoming some of the deficiencies of Five Forces framework (which is dealing well with the known competition and but lagging regarding innovation, constraints and uncertainty) as it looks from inside out. However, the dynamic capability approach is not a holistic one, it lacks integrity and needs to be complimented with some higher-order framework linked to strategy and value.

### **2.3 Change as Disruption / Innovation**

The automotive industry is heading into disruption, managers should get ready for discontinuity. Change once might turn into disruption for those companies that have not adopted in time. And there many of companies at risk, KPMG GAES Report (KPMG 2016) tells that 82% of the surveyed executives consider disruption likely or extremely likely.

### **New technologies**

As EV technology is evolving it has been gaining ground and increasing impact on our environment and markets. According to KPMG GAES (2016) survey such developments as Hybrid EV and BEV were placed No. 2 and No. 3 consecutively as key trends until 2025.

### **Regulatory moves**

There are various governments EV stimulus packages already in place in many countries like Norway, South Korea, China, France, Sweden etc. The governments of China, UK, France, and India have announced that sales of ICE cars will be banned in foreseeable future, other countries like Germany have drawn the long-term plans for the uptake of EV technology. These regulatory actions put emphasize on EV proliferation, technological development and construction of charging network, but in the same time they further induce disruption in the established automotive industry.

#### **2.3.1 Disruptive market transformation and global challenges**

There are several indicators pointing that there is the ICE market disruption by the EV manufacturers. There are clear signs of disruption with a regional face, but one global pattern is appearing as well. EV market share grew 56 % YOY through Q1-Q2 2017 in Europe, making EVs the fastest growing segment (Autonews, 2017).

The global market share of EVs in 2016 have increased to 1,1% of all car sales and have reached the threshold of 1M vehicles. Jaguar, VW, Daimler, Volvo all have announced plans to compliment EVs to every vehicle line-up. The EV manufacturers are not just showing some wishful thinking to be the frontrunners in EV market transformation, they are also betting on with massive investments and supply chain developments. For example, VW announced their purchase plans

hovering over 50 billion Euro worth of batteries to invigorate its supply chain (Volkswagen AG 2017), hence motivating Tier-1 suppliers to expand their capacities, which would help to avoid some probable supply bottlenecks.

### **2.3.2 Disruption application in Business Models**

This study examines disruption in a close tie with BM innovation concept. It is hard to establish the cause and effect relationship with innovation and disruption as they typically come together. The concept of disruption also has theoretical links with a company capabilities concept. Such capabilities could be measured, developed and used under a business model framework. Prange&Verdier (2011) mention value-adding capabilities and disruption capabilities as second-order dynamic capabilities for global growing companies. Besides, developing disruptive capabilities is supposed to prevent firms from age-related liabilities (Prange&Verdier 2011:128). Managers could use disruption concept when assessing risks, vulnerabilities and opportunities in their current and future environments. When managers perceive disruption as an opportunity or threat the type of response shapes the dedicated resources (Gilbert & Bower 2002). Proper framing could spare some managerial mistakes, like the infamous Nokia's failure to take an opportunity on the global smartphone market. There are different reaction patterns among major ICE manufacturers to market disruption depending on the perceived threat to their core competences.

### **2.3.3 Disruption redefined**

Christensen et al. (2015) depicted successful disruption that usually takes care of customers ignored by the established companies. The authors made some projections about Tesla's BM as it doesn't follow the regular disruption route. The core argument is that because Tesla's EV high-end market entry was counteracted with enough resources and investment from incumbents, competing for the market share will be intense and the results are not definite. On the other hand, much of the counteractive corporate investments and efforts in the automotive industry could not be extended to their traditional competencies.

### **2.3.4 Innovation**

Another form of change that companies will encounter is *Innovation*. There has been a lot of interest for innovation change research in the literature. There are social, scholastic, economic, and other dimensions of innovation. This study broadly presumes *Innovation* as an adaptive or self-induced change that has internal utilitarian value and could be commercialized. Innovation change is relatively young domain in our economic theory, although some important early contributions were laid down by Ricardo, Weber and Schumpeter, and the following innovation classification was suggested:

- 1) introduction of a new good;
- 2) introduction of a new method of production;
- 3) opening of a new market;
- 4) conquest of a new source of supply of raw materials or halfmanufactured goods;
- 5) implementation of a new form of organization.

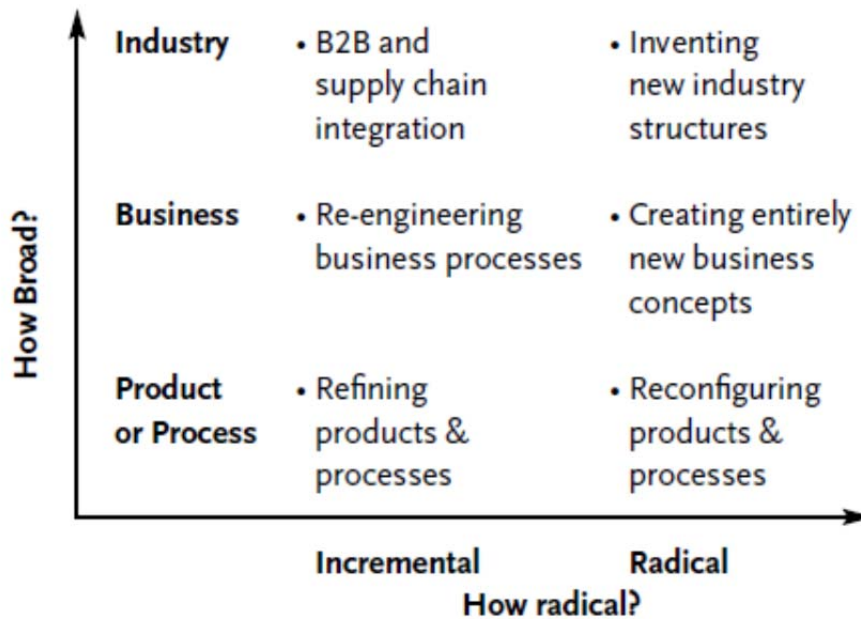
(Godin 2008:35)

### **2.3.5 Management Innovation**

Christensen (1997) approached the concept of innovation by making distinctions between *sustaining* and *discontinuous* innovations. Sustaining innovations relate to the existing products, models or services and are inherently linked to incremental improvements. Discontinuous innovations have disruptive nature and act upon maximum differentiation. Hamel and his colleagues brought a new perspective in the field of management innovation. In their view, a business concept innovation strategically is not a way of positioning *against* competitors, but rethinking how to go *around* them. It's based on "*avoidance, not attack*" (Hamel 2000:72).

This study could employ the following definition of management innovation as "*a difference in the form, quality, or state over time of the management activities in an organization, where the change is a novel or unprecedented departure from the past*" (Van de Ven cited by Birkinshaw et al. 2008:826). Innovation can be applied to many objects and can operate at different levels: products, services, processes, supply chains, business models etc. The study particularly considers innovation as a deliberate managerial innovation throughout this paper.

### **2.3.6 Innovation dimensions**



**Figure 2:** Innovation dimensions (adopted from Hamel 2000:64)

Accordingly, business level innovations can be either incremental or radical.

Managers operating on the business level have several pathways for going ahead with innovative change. Differentiation, creativity and disruption are the most used, but the list is wide open. Explorative activities that are risk-taking and uncertainty challenging are often correlated to innovation. There are also suggestions that leveraging the resources is essential for innovative creation and appropriation process Ostendorf et al. (2014:506).

There is also a possibility to segment the corporate innovation efforts by Risk/Familiarity dimension. Companies can venture out depending on their market familiarity or the perceived risk to benefits ratio.

### 2.3.7 The Reasons for Innovation

Innovation like any change should be aligned with the corporate strategical purpose and value objectives. There could be several societal functions of innovation like a relentless pursuit of improvement, a spring of creativity, a source of competitive advantage, and a tool for creating value and societal benefits. Innovation can also be designated as a core value of growth, performance, or valuation. Business importance of innovation derives from a sustaining “*innovation that creates*



*measurable value at scale – the only kind of innovation that has a significant financial effect” (Barsh et al. 2008:37).*

Possible *innovation drivers* include:

- Environmental and competitive pressures;
- Shrinking value;
- Changing customer demand, product/service expectations;
- Technological readiness, alternative product qualities available;
- Changes to market, to market position, and to market share;
- Shorter product life, line-up revamps requirements;
- Thrive for novelty.

### **2.3.8 Best-in-class innovation**

Managers can learn more about innovation in their real business environment through some best-in-class examples. There are several recent ratings of the companies that successfully pursue innovation which include Tesla Motors:

These are the historical results of Tesla from BCG (BCG methodology 2016-2017):

2014 Tesla No. 7 (BCG The Most Innovative Companies 2014)

2015 Tesla No. 3 (BCG The Most Innovative Companies 2015)

2016 Tesla No. 3 (BCG The Most Innovative Companies 2016)

The question remains how we select those innovative companies? Should we judge by R&D expenditures or should we agree with the media appraisal of fancy corporate inventions? Spending a lot of money in R&D without having a new business model for extracting value from your great invention does not make you an innovative company, the Xerox case had enough to show (Chesbrough & Rosenbloom 2002).

One explanatory idea derives with a concept of *Innovation Premiums*. The extraction method is to compare Enterprise Value (or Market Capitalization) with the base value originated as the Net Present Value of the future cash flows. The positive differences between the enterprise value and the value from the existing business forms the *Innovation Premium* (Dyer & Gregersen 2015).

According to this methodology Tesla has substantial innovative premiums installed in its Enterprise Value.

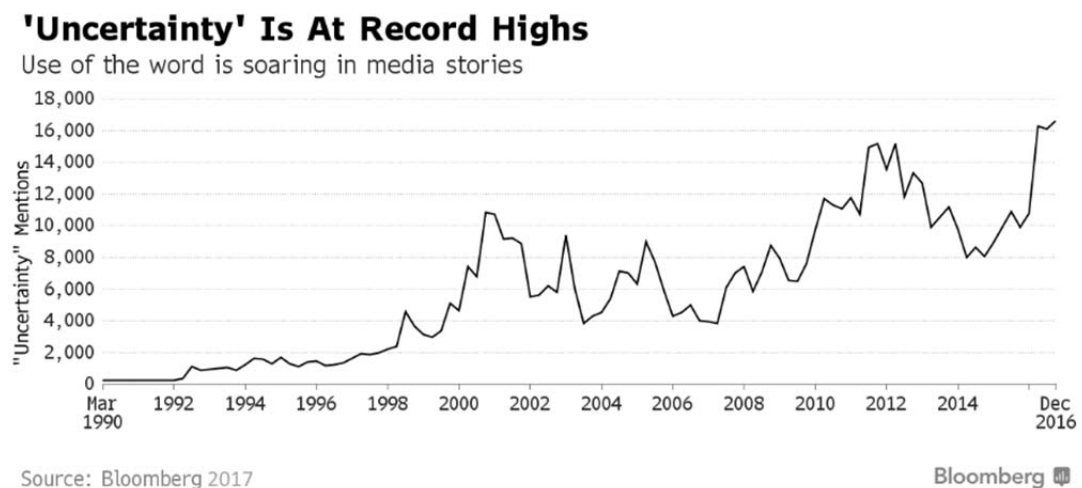
2015 Tesla is No. 1 in the Forbes Top 10 Most Innovative companies 2015 list.

2016 Tesla is No. 1 in the Forbes Top 25 Most Innovative companies 2016 list. In 2017 Tesla in No. 2 on the list of Forbes Top 10 Most Innovative companies 2017. (Forbes 2017, 2016, 2015)

These top positions indicate some strength of Tesla's innovative business model that ensures the company will radically increase sales and will continuously attract value in the future. Business model innovation is covered in sections 2.8.2 and 4.5 of the Thesis.

## 2.4 Change as Uncertainty

Rapid environment changes, swift market fluctuations, and unpredictable actions of the actors on a competitive marketplace contribute to uncertainty. Uncertainty in model inputs producing multiple outcomes might oscillate the system and render the model response with extra costs or produce undesired results. Overall global uncertainty is rising and this is a significant problem for managers. Steven J. Davis (2016) claims that the average value of the Global Economic Policy Uncertainty Index is 60 percent higher from July 2011 to August 2016 than in the previous fourteen and one-half years and 22 percent higher than in 2008-09. Bloomberg (2017c) reports of record highs of uncertainty word usage.



**Figure 3** Uncertainty (adopted from Bloomberg 2017c)

There are several factors of economic uncertainty that can apply to EV manufacturers. This work could name the following inputs prone to change:

- a) Regulations
- b) Subsidies

- c) Cost of raw materials (oil, lithium, copper, precious metals prices etc.)
- d) Supply-demand equilibrium
- e) Competitive reactions

This list is not closed as uncertainty has almost endless possibilities with a variety of inputs.

This study sees several countermeasures to cope with the adverse uncertainty. As a manager, one can gather all the relevant information about the state of the system, identify and focus on the most critical points in their BM, reduce risks and uncertainties for those most important points. We can further reduce the unnoticed events by using big-data and early warning clues. Managers also have a chance to look at feedback delays within complex systems. If a problem is unnoticed for a long time it may be unreasonably difficult and costly to solve when it finally becomes evident (Meadows 2009:3). The idea here is remove input delays by constantly monitoring the environment and obtaining the instant system status. There are available controlling tools, managers can also notice any business model disturbance with visual data tools (dashboards), direct system stress status (heat maps), and regular sampling checks.

There are several system-based generic answers to uncertainty. Basic tools are organized according to the types of model response.

**a) Reactive**

Managers might apply the established processes to match the new inputs, so they can replicate past experience to a new situation. (Laloux 2014:20). Model flexibility, however, comes at a cost.

**b) Innovative**

Exploitative mode has efficiency issues when juxtaposed with uncertainty.

Why don't we change the game through creating scenarios? Or should we create new contingencies? The type of signal defines the type of response, so as Laloux suggests, managers can record multiple "what if, as if ... then ..." contingencies where each stage is well adapted to certain contexts (Laloux 2014:38).

The functional frames of references (models) are the way of coping with environmental uncertainty and ambiguity. Although, coping with environmental

uncertainty “*does not necessarily eliminate external uncertainty*” (Schreyögg and Sydow 2010). The realistic aim is to partially reduce uncertainty for several critical BM components and design the model in a way when the outcomes are more predictable.

## **2.5 Change and Complexity**

Rising complexity is another aspect of change facing the EV manufacturers.

Complexity theory views organizations openly interacting with their enriched environment. Companies respond to change through their enhanced interconnections. As the systems and models becomes more complex, their coherence and internal alignment with the next phase of change becomes more difficult. Megatrends and their outcomes could also be viewed as multifaceted and complex change. Every company now is feeling the market vibrations even from a geographical distance.

The complexity theory elaborates on such concepts as certainty-uncertainty, continuity, emergence, equilibrium, feedbacks, self-organization, thresholds, and others that are of special interest for the companies undergoing through the period of transformation in their unpredictable and sometimes chaotic environment. Various connotations of complexity exist within different disciplines, but the definition of complexity is as troublesome to grasp as the term itself. This study has no intention on melding all of them, however we should indicate some critical descriptive characteristics of complexity in changing systems.

These are several key features of complex systems: highly structured; vertically and horizontally differentiated; sub-systems exist; various components; interconnectivity; some degree of decentralization of the process controls. The level of complexity is characterized by the number and diversity of inputs and outputs in a system. Complex model evolution is also path-dependent from its initial conditions (Allen et al. 2011:20). One of market economy’s characteristics is a presence of feedback loops also known as ‘the invisible hand’. In our open global complex systems numerous positive and negative feedback loops exist influencing countless variables. The sheer number and the variety of connections and interactions in the system can foretell for the speed of change when the input changes. Rising complexity is a global phenomenon, but the relative degree of complexity in the automotive industry is higher than in many other industries. Some researchers reasonably argue that such

flexible network arrangements as just-in-time and lean production combined with higher efficiency also bring greater levels of complexity in the automotive industry (Spencer and Carlan, 2008:266).

### **2.5.1 Complexity and Business Models implications**

The managerial task is to effectively deal with rising complexity in changing environments. The main limitation is that organizations should efficiently (at reasonable costs) handle the complexities facing them. This challenge is not identical for all the firms. System complexity, model and organizational complexities are higher in rich and unpredictable environments. Big international companies have more interdependencies, more stakeholders, they tend to create more structures for a larger variety of tasks, thus complexity is positively correlated with size and market differentiation. In fact, the automotive industry is highly integrated into our global economy, it has numerous interrelations and it is prone to demand fluctuations as well as periodical growth and crises cycles. Change sensitivity and competitiveness in the automotive industry have increased greatly propelled by a free flow of information.

Contemporary scholars underline the necessity of investigating the factors influencing the complex system before the tipping-point, as “then there is a possibility to influence the future state, and after the tipping point it might be too late”. (Boulton et al. 2015:42). This rule also applies to various process outcomes, product life-cycles, market trends etc. Reduction of complexity is doomed to be a Sisyphean task since the global trend of rising complexity goes the opposite. However, several methods are available to control complexity and promote simplicity rules in organizations (see John Maeda for more).

### **2.6 Change and Ambidexterity**

In a virtual ‘no-changes’ simulation setting a company’s performance and success could stem from a pure exploitation. In our realistic dynamically changing and complex context, however, it is a given that a company will always face the contradicting strategic choice between exploitation and exploration modes. As a response to this conflict the concept of *Ambidexterity* had been developed in the

literature. The relevant research on this topic considers *Ambidexterity* as an organizational and a strategic management ability, and scholars argue that *Ambidexterity* should also be viewed as a *Dynamic Capability* (O'Reilly & Tushman 2007). Managers should get familiar with this capability routinely solving their main dilemmas or while trying to select the conflicting priorities, allocating the resources or apprehending uncertainty. For the purpose of this study, *ambidexterity* is referred as the ability of firms to both exploit and explore. (Simsek et al. 2009:864).

The practical dimension of ambidexterity should be viewed as a combination of explorative and exploitative capabilities. “*Exploitation is about efficiency, increasing productivity, control, certainty, and variance reduction. Exploration is about search, discovery, autonomy, innovation and embracing variation. Ambidexterity is about doing both*”. (O'Reilly and Tushman, 2007:10).

The contemporary ambidexterity research looks for the ways when efficiency and innovation do not need to be the strategic trade-offs and advocates corporate top-down approach. Acquiring such capability has direct impact on business performance. Resulting, ambidexterity is a critical capability that could help companies to get out from competency traps or to progress to best-in-class performance (Lubatkin et al. 2006:668).

### **2.6.1 Ambidexterity and Business Models implications**

Clearly, Business Model change approach and the development of ambidextrous capabilities have conceptual similarities. **Ambidexterity** is closely linked to internal coherence, adaptation and flexibility as depicted in the description of contextual ambidexterity as “an organization’s capacity to simultaneously achieve alignment and adaptability within a single business unit” (Gibson & Birkenshaw 2004:211). Similar capabilities are important for facilitating, adapting and innovating a firm’s BM as well. Some of the automotive companies like VW, BMW, and Toyota have announced they can employ this capability successfully. There was also at least one attempt to forge an ambidextrous alliance between the automotive manufacturers with different priorities of exploitation and exploration. In 2010 Toyota, then a hybrid-technology pioneer and a *monozukuri* expert, decided to cooperate with Tesla’s risk-taking, Silicon Valley approach. (Toyota Motor Corporation, 2010). The partnership had been effectively dissolved in 2014, and Toyota had sold the last Tesla shares in 2016 (Financial Times, 2017). Long-term mastering of ambidexterity

appears to be very challenging as a source of conflict is internally fixed in the concept itself. On the other hand, there are some possibilities of impulse or time-limited vector corrections as successful ambidexterity characterizes itself through resource and load harmonization, task partition, exploitation-exploration cycles that could be sequenced as well (Simsek et al. 2009:870).

## 2.7 Flexibility

Flexibility is one of the important outcomes and antecedents of change in the automotive industry. Flexibility approach primarily reflects the adaptive response to the environmental changes and market fluctuations especially affecting production volumes, manufacturing layouts and product variety characteristics. Depending on a situation and a nature of change-affected relationship flexibility has many dimensions: product flexibility, supply-chain flexibility, structural flexibility etc.

Flexibility can also be described as the “ability to respond to changing conditions within a very short time and with little penalty in cost and performance” (Upton 1995:207). Chryssolouris et al. (2013) defines flexibility as “the sensitivity of a manufacturing system to changes with regards to the changes occurring in its environment”. Some scholars explore the relationship between flexibility and operational efficiency emphasizing the role of innovative ambidexterity (Kortmann et al. 2014). The number of researchers also considered the firm’s capability aspects with *strategic flexibility* concept. Strategic flexibility is broadly defined as the ability of companies to respond and adapt efficiently to environmental change.

Strategic flexibility is understood as:

- the ability to manage strategic risk;
- the ability to respond to environmental change (both opportunities and threats)
- the ability of a company to use its resources in both a proactive and a reactive way.

(Roberts & Stockport 2014:41)

Shimizu & Hitt (2004:45) defined strategic flexibility as “an organization’s capability to identify major changes in the external environment (e.g., introduction of

disruptive technologies), to quickly commit resources to new courses of action in response to change, and to recognize and act promptly when it is time to halt or reverse such resource commitments”.

### **2.7.1 Flexibility implications in Business Models**

Some of the most useful flexibility features in the automotive industry are scalability and changeability. The recent advances in product and process flexibility are noticeable in Industry 4.0 development, flexible manufacturing layouts, 3-D printing and so on. The main trade-off of flexibility is that the better responsiveness usually consumes the higher amount of resources.

Business models can have various flexibility features especially in revenue streams, customer channels, and customer relationships. When making their strategic flexibility choices managers need to anticipate both risks and opportunities, as well as the consequences of changes and the costs of maintaining the status-quo. Opting for the best solution managers need to take into account the cost-benefit function of flexibility and changeability as any type of flexibility (including a supply chain flexibility) comes at the cost. Flexibility is beneficial when the process output still matches the intended objectives coping with environment the uncertainties and the dynamic inputs. The variance enhancement should be limited to the to the internal need to have multiple process outputs based on the customer demand for variety or novelty. Cautious holistic approach with all the considerations of costs and time constraints, value, and quality should be applied when choosing to maximize flexibility.

## **2.8 Business Models**

A Business Model is a very powerful tool for conceptual representation of specific business activities, capabilities, alignments, interrelations, and value streams. The companies could be consistently analyzed and compared across the industries based on their business models. Via BM framework managers can map the essential model features, analyze its elements and relationships, deconstruct the business model, and finally synthesize the new business model. This framework is gaining popularity and according to Massa et al. (2017:75) the number of BM research articles published each year have grown from a dozen in 1995 to over 1000 in 2015.



### **2.8.1 The Business Model Definition**

The Business Model framework still has substantial conceptual divisions among the academic proponents due to its relative recentness, and because it is component based and descriptive. These conceptual and theoretical differences may be attributed to the nature of a model that is an abstract of organizational essence, certain simplification, but certainly feasible for our analysis and assessment. The Business Model concept also has various forms and definitions.

Gary Hamel had stated that BM is “*nothing else but the business concept implemented in practice*” (Hamel 2000:66).

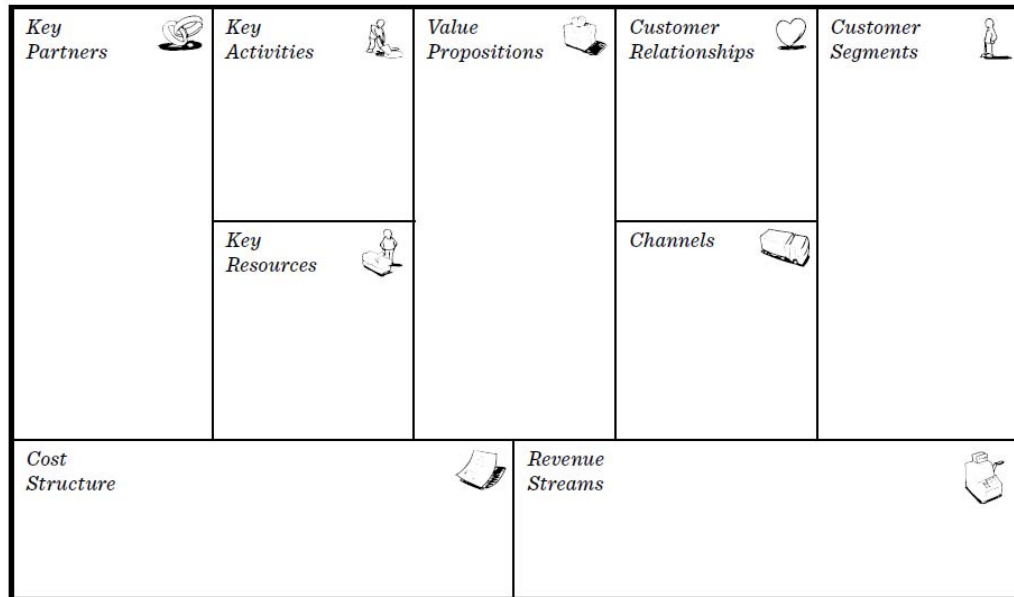
Osterwalder (2004:9) initially defined BM as “... *logic how money is earned in a company*” then reformulated to “*Business model describes the rationale of how an organization creates, delivers and controls value*” (Osterwalder & Pigneur, 2010:14).

Teece (2010:173) provided the descriptive definition of BM of a business model that articulates the logic and provides data and other evidence that demonstrates how a business creates and deliver values to customers. In his view, BM also outlines how enterprises entice payments and convert these payments to profits.

A different BM perspective by Amit and Zott (2001) focuses on the encompassing value transit. The authors have given the following definition of a business model that “depicts the content, structure, and governance of transactions designed so as to *create value through the exploitation of business opportunities*”(Amit & Zott, 2001:4). Chesbrough (2010) focused on new ideas and technologies that companies can commercialize through their business models. This multifaceted concept of the business model also attracted some early critics like Porter. Massa et al. (2017) have provided a comprehensive critical assessment of the Business Model research.

### **2.8.2 The Business Model Function**

This study will employ *Business Model Canvas* – a popular framework of BM visualization as a foundation for its own BM assessment. This substantial business model contribution was developed by Alexander Osterwalder and Yves Pigneur (2010).



The Business Model Canvas.

**Figure 4** The Business Model Canvas (Adopted from Osterwalder & Pigneur 2010:44)

It consists of **9 Key categories** (BM components).

Chesbrough and Rosenbloom (2002) identified the following functions of the Business Models:

- a) Value proposition articulation;
- b) Value chain and value network specification and positioning;
- c) Market segment identification;
- d) Description of revenue streams;
- e) Formulation of strategic choices.

The main use of Business models derives from picturing of strategy, shared vision, and strategic alignment. This study names the following BM tools:

**a) *The big picture. Tool 1: Comprehension***

BM ties the components abstractly by visual means and replicates the relationships. It helps to answer the Question: What?

**b) *The whole system is more than the sum of its parts. Tool 2: Complex analysis.*** The aim is to explore the BM's interrelationships and elements, and uncover business logic and strategies. The use of the Business Model arises from mediating between the company's strategy, value creation and value capturing features. Question: Why?

**c) *Construct. Tool 3. Future Prognosis*** .It is possible to model the BM components in a prescriptive way fitting to our specific objectives and

criterion. This learning and evolving function allows innovative change and modification of the current BM. Question: How?

Although Business Model framework has limited predictability when elevated out of the context the study by Weil et al. (2005) reveals that some business models perform better than others on key measures of financial performance The BM analysis depth is focused on operational and strategic levels with a careful reassessment and alignment of the core elements. By using BM means managers can make extensions to some core competencies, whereas a competency must fulfill three criteria to be considered core: it must contribute to the benefits of end consumers; be difficult to imitate for competitors; and be re-usable across a variety of products and markets (Prahalad and Hamel 1990 quoted by Knecht 2014:31).

This study purposely compares the current business model of the EV manufacturer to the next one (which is exposed to the stress factors) by using the same analysis lens and exemplifying the differences.

Saebi (2014) has proposed three time-related change contingencies of business models:

- a) Evolution,
- b) Adaptation,
- c) Innovation.

|                                  | <b>Business model Evolution</b> | <b>Business model Adaptation</b> | <b>Business Model Innovation</b> |
|----------------------------------|---------------------------------|----------------------------------|----------------------------------|
| Planned Outcome                  | Natural; Minor Adjustments      | Align with the environment       | Disrupt market conditions        |
| Scope of change (areas affected) | Narrow                          | Narrow - wide                    | Wide                             |
| Degree of radicalness            | Incremental                     | Incremental - radical            | Radical                          |
| Frequency of change              | Continious; gradual changes     | Periodically                     | Infrequently                     |
| Degree of novelty                | Not applicable                  | Novelty is not a requirement     | Must be novel to the industry    |

**Table 2 BM Change contingencies** (adopted from Saebi 2014:38)

**Business Model Optimization (BMO)** (a substitute term for BM Evolution and BM Adaptation) is driven by value. A firm's motivation for BM optimization can rely upon:

- Diversification and Differentiation needs;
- Utilization of opportunities;
- Development of unique propositions

Business model *evolution* refers to the effective standardization, replication, implementation and maintenance of the *existing business model* (Saebi 2014:9). Reinvention and BM optimization are also caused by external pressures such as competitive threats and actions, underutilized opportunities and/or internal factors like diminishing corporate returns.

### **2.8.3 Explorative and Exploitative Business Model Change Innovative changes**

Business Model change can also be classified as *Explorative - Exploitative* whereas this dichotomy reflects the underlying Exploit-Explore dimension. Business Model *innovation* effectively employs *explorative* change. Innovative business models find a novel way to create and to capture value from the firm's interactions.

Organizational motivation for innovative change is similar to the discussed business model optimization. Additionally, the companies might follow the customer's taste for novelty and can have disruptive ambitions. Hamel (2000) argues that hardly any company will embrace the radical innovation path unless it believes that strategy decay is inevitable.

The core problem of disruptive innovation has been highlighted by Chesbrough (2010): "*the root of tension is the conflict between the business model established for the existing technology, and that required to exploit the emerging, disruptive technology*".

#### **Trade-off or there is a Third Way?**

There is still an open question whether companies can combine both business model approaches. The notion of ambidexterity had been developed in the literature that

reflects a combination of explorative and exploitative characteristics. For the purpose of this paper ambidexterity enables a Business Model to be externally fit for the state 1.0 (exploitative quality) at the same time as for the next state 2.0 (explorative quality). Strong continuity between those two states might be a prerequisite as it is hard to achieve the simultaneous alignment in a disruptive environment. Higher-order ambidexterity might be realized having different units fit with different objectives. The critical point here is the discontinuity of value attributes. Markides & Oyon (2010) have also investigated two business models coexisting in the same industry. The authors warned against seeing the simple extension link from the existing business in case when markets are different i.e. they are “made up of *different customers who want different value attributes*”.

It is also important to discuss the methods of BM validation techniques. Effectively adapted BM traits are related to robustness and could be confirmed during a BM stress test. **BM robustness** is considered as the long-term viability and feasibility of a BM in a given future environment” (Haaker et al. 2017:16).

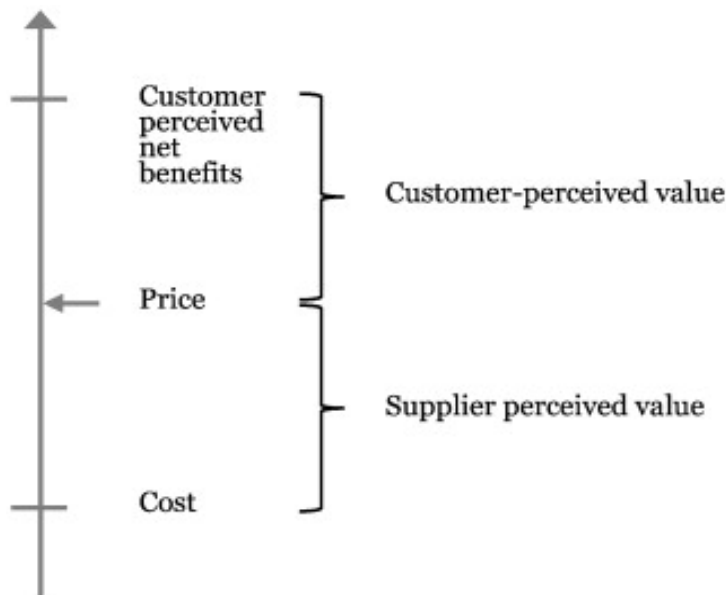
The successful business model can be imitated by competitors. However, the company can delay that moment and reap the benefits of its competitive advantage and make the repetition troublesome by developing the core competences, offering unique value propositions, locking into the strategic partnerships and alliances.

## **2.9 Value and the Purpose of Change:**

The concept of *Value* is instinctively close to the concepts of change and transition. Searching for value while anticipating change brings us closer to answering the questions Why? and What? The concept of value is extensively used in many fields of primary and applied economic research, it relates to marketing and psychology domains and spans to some specific issues like market price-premiums comparisons or customer justification and many other topics. Nevertheless, there also have been a lot of confusions regarding the practice of term *Value*, as it is widely used in a variety of ways. The concept scope is inclusive as well, for instance, Almquist et al. (2016) mention up to 30 core value elements.

There is a need to define which dimensions of value are appropriate for this study. Firstly, it is essential to differentiate between *Use value* and *Exchange value*. Bowman and Ambrosini (2000) provide the distinction between *use value* as being

perceived by the customer, and *exchange value* referring to price when the product is sold. Core attributes of Value are presented in the next Figure 5.



**Figure 5** Core Attributes of Value (adopted from P. Töytäri et al. 2015:55)

This thesis closely deliberates *use value* or otherwise *CPV* since it has more relevance for the business-model framework (Ulaga and Chacour, 2001) and because ***CPV is the logic that drives the business model*** (Teece, 2010; Amit et al. 2010). The supplier-perceived value perspective is considered whereas it overlaps the customer value perspective or can affect the CPV.

Woodruff (1997: 142) defined CPV as:

- (a) “*customer’s perceived preference for an evaluation of those product attributes, attribute performances, and consequences arising from use that facilitate (or block) achieving the customer’s goals and purposes in use situations*”.

Perceived value is determined by looking at the factors of price and quality and it can be summarized by the following equation:  $(CP) \text{ Value} = \text{Quality (Q)} / \text{Price (P)}$  or otherwise  $\text{Value} = \text{Relevant Customer Benefits} / \text{Applicable Costs}$ .

The *Quality* consists of *Product attributes* that are comprised of:

- Core Attributes
- Value attributes
- Satisfaction Attributes

Other researchers link value creation and financial and nonfinancial measures like customer satisfaction, product quality or customer loyalty that is variable and must be evaluated on a case-by-case basis (Mauboussin, 2012). There is also a concept of **Net Value = Benefits – Costs** (Gallo, 2015). Another thought-provoking approach is to study the value function as a proximity relationship of the product attributes to the customer expectations. The unique value discipline is advocated by Toyota. According to Toyota's Value Creation Department there are five intangible value directions for building corporate value:

- So: Adequate Existence = 1/X;
  - Sei: Living Beautifully;
  - Do: Human-like Encounters;
  - Ten: Cherishing Transition;
  - Wa: Nurturing Family Love.
- (Toyota Motor Corporation, 2012)

We could distinguish between *objective value* and *perceived value*, but a far more productive is to look at economic value to the customer (EVC) also known as True economic value" (TEV) as Dolan (1999, 2003) had proposed, whereas:

**TEV = Cost of Best Alternative + Value of Performance Differential**

EVC can also be viewed as *Tangible value* the product provides + *Intangible value* the product provides. Customer subjective framing of the product's use implications and the consequences of the specific allocation of the resources (time, money, attention, bonding). EVC plays a critical role in strategic assessment of value propositions, or the company's value network.

### **2.9.1 Practical dimensions of Value in Business Models**

*Here the study will attempt to answer what is the comprehensive approach to assess customer value in business models under dynamic constraints.*

Competitive conditions in the automotive industry, product specification comparisons and a customer search for the very best alternative call for TEV as a measurement of choice. It is important to follow the changes of EVC as they can have implications for a BM. Gallo Amy (2015): quotes Jill Avery who argues that "*changes in EVC can indicate changing customer needs or changing competitive conditions*". Thus, managers should track those remarkable changes in EVC and

draw accurate conclusions on what the EVC in their BM actually is. The qualitative visual representation of the CPV and EVC values could be achieved by using spider- or radar-charts. This type of diagram provides the clear demonstration of the element and can represent its deviation over time (Amini et al. 2014:395). This work uses the same type of value representation. It is important to analyze and assess Value, and EVC, in particular, when implementing a business model change since every induced change must have a purpose, a value and a cost. We are still in need of the synthesized model of value to complement the existing one. This task, however, goes beyond the focus of this study.

### **3. RESEARCH METHODOLOGY**

#### **3.1 General research Methodology**

Research contribution is facilitated by synthesis of several theoretical approaches and application of the comprehensive business-model framework. This Master Thesis consist of the theoretical and the practical research parts. The methodological approach is to use logical, empirical, analytical and statistical techniques.

Theoretical part of this Master thesis employs several methods:

- Observation
- Induction and deduction
- Raising and testing hypothesis
- System method
- Synthesis
- Making comparisons and analogies

The Business Model approach is confirmed as the applicable form of adaptive change assessment. Explorative – Exploitative dichotomy is exposed. The following concepts are elaborated with a relationship with the business model framework: change, dynamic, complexity, uncertainty, innovation, disruption, ambidexterity, value.

The secondary research is organized by obtaining the relevant information from:

- Corporate websites of automotive companies;

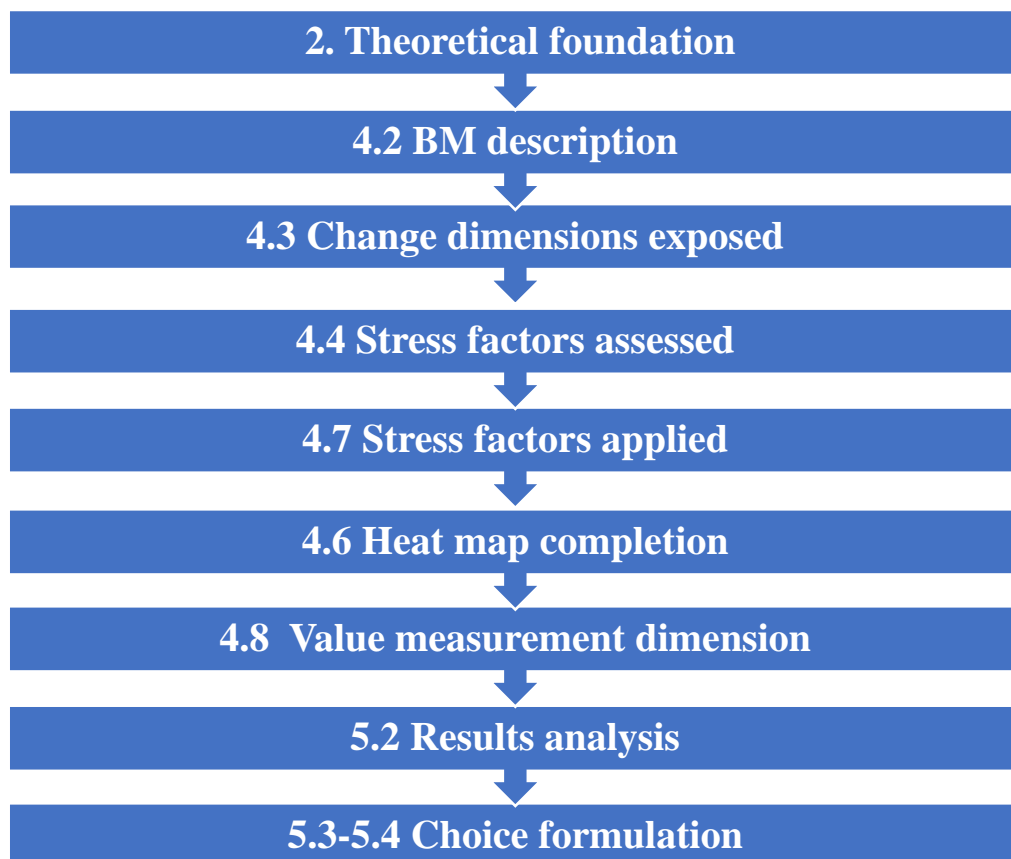


- Scientific articles in journals;
- Books on relevant topics;
- Major consultant companies' publications, expert opinions, news blogs and other reports about the automotive industry;
- Management interviews, conference proceedings available online;
- Thematical websites and online communities on EV technology, EV sales, and forecasts;
- Government and commercial statistical sources;
- Government energy and transportation departments, other regulatory, international, and non-governmental organizations' sources.

### 3.2 Practical research Methodology

Practical research part of the Thesis employs multi-dimensional assessment of several change contingencies in a business model framework. The EV manufacturer's explorative business model serves as a case study. Qualitative and quantitative data regarding the case study are processed.

**Figure 6** displays the Methodology of the Practical Research.



**Figure 6** Methodology of the practical research

Firstly, the current business model state is described (base state or 1.0). Then, the study identifies the change contingencies, uncertainties, and trends that can be stress factors. Those change factors are juxtaposed to changes and alternations in an EV manufacturer’s business model. The necessary information is obtained via open sources such as news articles, investor reports, blogs, the company’s websites and academic publications.

Further, a stress test of the business model is conducted. The procedure is grounded on Haaker et al. (2017) methodological approach. Accordingly, the established change stress factors are applied to the initial elements of the business model. The change results are simulated with a variable (an internal trade-off choice, or external change contingency) that can produce different outcomes. These change effects are mapped onto the next model state. After that, a color-coded table is created, which is visualizing the outcomes of the stress test. The combination of the stress tests comprises the heat map. The heat map is using intuitively comprehensible colors: red, orange and green. MS Excel, and DRAW.IO software are used to complete the table.

Finally, through repetitive analysis of the heat map some assumptions are drawn about the areas of model vulnerabilities necessitating managerial attention and resource allocation. Cross-matrix analysis of the heatmap is linked to business model *canvas* components (based on Osterwalder & Pigneur 2010).

|                       |
|-----------------------|
| Key Partnerships      |
| Value proposition     |
| Channels              |
| Key Resources         |
| Key Activities        |
| Customer segments     |
| Customer relationship |
| Cost structure        |
| Revenue Streams       |

**TABLE 3** Business Model Components

The relative strength (or robustness) of the business model is assessed by the number of business model elements in the base model state 1.0 fit for the stressed state 2.0.

The growing number of required model alternations on one axis decreases the strength (robustness) of the BM. Value dimension was selected as being the most appropriate to reflect the alternations results or change outcomes for both models.

Additionally, there is a practical implementation of a test spider (radar) chart for *Customer Perceived Value* deviation measurements based on methodological recommendations (Amini et al. 2014).

The following research outcomes are expected:

- a) to exemplify the use of change contingencies in an EV manufacturer's business model.
- b) to define a set of feasible strategic choices.

## **4. RESEARCH**

### **4.1. Research Introduction**

A case study approach was preselected in order to inspire new practical solutions to managerial problems developing on a business model approach. Changing traits of the research subject emphasize the selection of the case study format because of its ability to illustrate theoretical concepts in a dynamic context (Siggelkow 2007:22). The aim is to build on the existing theory, to familiarize managers with the appropriate change contingencies and facilitate appropriate solutions for the main trade-offs and managerial choices.

#### **Case study Tesla**

Tesla Motors Inc. is an automotive company, which was incorporated in 2003. Tesla produced its first serial car – Tesla Roadster in 2008. Tesla's current core activities are: the research and development, manufacturing and sales of Electrical Vehicles. The company also functions in other activities such as financial services; software and technical development; production, sale, installation and maintenance of charging stations (McKinsey 2014:50).

The case study has to be vivid, it should complement the theory and bring new insight, it also must be illustrative and relevant. Tesla was chosen as a case study because of the extremely innovative business model that challenges and disrupts the automotive industry. Tesla has a distinctly explorative approach that can be

compared with pure theoretical categories. More over, the it has attracted a lot of customer attention economic research Summing up about the special Tesla venture features here are the CEO of Toyota Mr. Toyoda's own words: "Toyota would like to learn from the challenging spirit, quick decision-making and flexibility that Tesla has" (Toyota Motor Corporation 2010).

### **Tesla's vision**

The automotive industry is mature, both EV and battery storage technologies have been around for years, so what makes Tesla such a unique case? There are several reasons for that.

Elon Musk's vision of Tesla could be exemplified by his own words in 2006:

"By leading the technology change from gasoline to electric vehicles, Tesla has the potential to be one of the great car companies of the 21st century,"... "The starting point is a high performance sportscar, but the long-term vision is to build cars of all kinds, including low cost family vehicles,"... "Tesla is one of those rare opportunities to change the world in a positive way and build a valuable company in the process." (Businesswire, 2006).

Tesla's vision could also be characterized by pro-active change, disruption, differentiation, hi-end market entry and a consequential shift to low-cost mass-market production. The full-on transformation of the automobile industry is obviously on the strategic agenda.

### **Market valuation of the company**

The stock value of the company had grown over 18 times in the last five years to 56,97 billion USD as of August 22, 2017 (see Figure 7). Tesla is currently on the fourth spot in market capitalization, behind such automotive giants as Toyota, Volkswagen, and Daimler.



**Figure 7** Tesla Marker Value (adopted from Y-charts, validity Date: August 22, 2017)

Throughout this 5-year period Tesla Motors had outpaced the industry’s yearly changes of valuation by far, despite many challenges, and investor hesitations. Well, despite such a degree of investor hesitation that some experts use a term ‘radioactive’ referring to the automotive stocks (Bloomberg, 2017).

Tesla has negative ROI in the short-term (Q4 2016 = -7.38 compared to 11.23 ROI for the industry and comparative 10.74 figure for the sector) (Reuters 2017). The company’s historical financial result is negative, but it still overperforms the market competitors in terms of market valuation.

The stock-market researchers argued that the price appreciation for Tesla’s corporate value could not be explained by the available fundamental analysis tools like DCF, therefore such divergence from the rational fundamental value must be *the investor sentiment* (Cornell and Damodaran, 2014). The scholars further concluded that almost all the market value of Tesla Motors comes from future growth (Cornell and Damodaran 2014:7). However, predictions of the company’s future cash flows beyond the operating horizon in the long-term might be highly speculative and quite risky. What other factors could be behind this value appreciation, if it is not the

sentiment? Some business analysts turned their attention to such valuation factor as the *innovation premiums* (Dyer & Gregersen, 2015; Forbes, 2016, 2017). Throughout this work we should be able to find the roots of such investors assurance of Tesla's value despite having negative historic financials. It will also be beneficial to find answers, why is this happening with the automotive company in the industry that is so established and mature?

The intermediate objective of this case study is to find establish some stress factors that can lead to changes in Tesla's Business Model. By using this case study format this work will hypothesize whether these changes to BM (or their absence) might be related to:

Hypothesis 1a: The strength of Tesla's Business Model;

Hypothesis 1b: Overall EV market development (disruption of ICE technology, fast market share growth, product development phases).

#### 4.2 Tesla's Business Model Description

The current Tesla's Business Model is graphically represented in the Table 2 based on the nine BM Canvas components proposed by Osterwalder & Pigneur (2010)

|                    |   |  |
|--------------------|---|--|
| <b>Product</b>     | <b>Key activities</b>                     | <b>a) Product R&amp;D (EV)</b><br><b>b) EV Manufacturing</b><br><b>c) EV Sales</b><br><b>d) Operating charging network</b> |
|                    | <b>Value Propositions</b>                 | USP, emotional appeal to early adopters, hi-end.   |
| <b>Environment</b> | <b>Key Partners</b>                       | Panasonic, Borg-Warner   |
|                    | <b>Key Resources</b><br>Core Competencies | Brand, Design, Customer base, Gigafactory, Webpage, Charging Network   |

|                  | Strategic assets              |   |
|------------------|-------------------------------|---|
| <b>Customers</b> | <b>Channels</b>               | Prebooking, direct sales to end-users, global importers           |
|                  | <b>Customer segments</b>      | Individually segmented, Luxury product                            |
|                  | <b>Customer relationships</b> | Personalization of EV, Toll-free services, software configuration |
| <b>Finance</b>   | <b>Revenue streams</b>        | EV sales, battery storage, service, upgrades                      |
|                  | <b>Cost structure</b>         | Materials, Labor, Capex, R&D                                      |

**Table 4** Tesla’s Business Model 1.0 (current state)

### 4.3. Business Model Characteristics

#### What is special in Tesla’s Business Model?

There are two main aspects. Firstly, if the company is effective at CPV focused *value creation*, then it creates customer value that can’t be comprehended by pure financial metrics. There are market indications in favor of this possibility, for instance, Tesla tops 2016 Consumer Reports’ annual owner satisfaction survey. (Consumer Reports’ 2016).

This paper names the following characteristics that could be related to Tesla’s Business Model alignment, strength and robustness:

- a) Disruptive properties of the current business model (threatens ICE);
- b) Unique positioning. Tesla’s own perception of the core market is “particularly premium sedan, premium SUV and small to medium-sized sedan market” (Tesla Y2016 Report:6);
- c) Unique selling proposition. Some analysts have noticed Tesla is the only company selling significant volumes of a high-end, high-range EVs (Forbes, 2015:1);
- d) Core competencies:

- In-house design, research and development,
  - Battery production, Gigafactory 1;
  - Software and upgrades
- e) Tesla Brand;
- f) Synergies through solar and energy storage technologies;
- g) Retail strategy, outlets and service stations, Superchargers network;
- h) Strategic partners such as Panasonic;
- i) Relying on value creation and it is not the cost driven;
- j) Government and economic incentives for EVs play a significant role in value proposition component of the business model.

#### **4.3.1 Competitive assessment**

Tesla's current competitive position on the market and the subsequent need for alternations and changes could be assessed using Porter's (1979) frameworks (Barriers & Five-forces). Porter's barriers to entry the market (*economies of scale, product differentiation, capital requirements, access to distribution channels, government policy, changing conditions*) are considered by this study as stability sources and any major change to these barriers will have change implications for Tesla's BM.

##### **Economies of scale**

Vertical integration, systematization, robotization, assembly-lines, mass-production are all representations of the automotive industry which lives by the *economies of scale*. Tesla intends to grow on the economies of scale with the fully operational Gigafactory (its joint investment with Panasonic). The economies of scale are becoming even more important with the roll-out of Model 3 and the expected production growth.

##### **Product differentiation**

Tesla's BM relies heavily on *product differentiation*. It is true that Tesla had reinvented the EV in the eyes of the US and global consumers and the company has its unique image. There is a challenge to keep this leadership gap while EV



proliferation continues and new advanced models from Jaguar, Daimler, GM, VW and others are hitting the market.

### **Capital requirement.**

The automotive industry is heavily addicted to capital because of large CAPEX and R&D investments, delayed product readiness, and faster reinvestment of enterprise value into product development. (Fiat Chrysler Automobiles 2015:5). Investor relations are critical and the importance of this factor **will unlikely change**.

### **Channels**

As for the *distribution channels*, Tesla prefers to build the direct relationship with their customers through several means: direct online sales, prepayment on orders, and customization outlets. There might be a challenge to sustain the system costs as the quantity of orders grows, but the access to distribution channels is **not in danger**.

### **Regulations**

As for the *government policy*, the current Tesla's position is **prone to change** as government stimulus are time and volume bound on its core market. The US stimulus package is supposed to fade out as the EV manufacturers sales grow beyond 200000 vehicles (Slovik&Lutsey 2016:11). Tesla is on course to overshoot this target in 2018-2019. As the company expands from its core markets to high-potential there will be a challenge to satisfy the regional requirements and contradicting regulations on different markets.

### **Changing conditions**

*Changing conditions* effecting the core elements will facilitate the reconsideration of the BM. There is a variety of conditions prone to change including energy costs, non-monetary EV regional incentives, battery utilization rules, and many other possibilities. Due to their versatility and different origins they cannot be reduced to a single factor under the BM framework and will always generate some instability and uncertainty.

## **Opportunities & Risks**

Ascribing to Porter's perspective there are five competitive forces that shape opportunities and risks in an industry

- 1) Threat of new competitive entrants
  - 2) Threat of substitute products and services
  - 3) Bargaining power of suppliers
  - 4) Bargaining power of buyers
  - 5) Intensity of rivalry among established firms
- Adopted from (Porter 1979: 141).

### **New Entrants Threat**

The threat of new competitor's entry is realistic as many would like to capture some portion of the projected EV market growth in 2020-2030. This certain risk exists with the current ICE manufacturers expansion into the EV segment. For example, Jaguar presented their E-Pace due to be market ready for 2018; Daimler, BMW are already in the race. Many other competitors like Volvo Cars, Porsche or VW have made similar announcements (GreenCarCongress 2016). CPV model could be used to access the disruptive potential of possible alternatives. New entrants threat should be considered *as a stress factor*.

### **Threat of substitute products and services**

Toyota, Hyundai and Honda are leading in research and development of the alternative fuel-cell propulsion. This risk is limited due to marginal exposure of this alternative technology, high costs and fuel supply shortcomings. This stress-factor impact is currently limited.

### **Relationship with the suppliers.**

Tesla intends to further develop its own core capacity: battery as a power source. The partnership had been established with Panasonic. Besides, Tesla has many of the core-competences in-house: powertrain, software and controls. The relationships with the other suppliers are not critical aside some function-specific auxiliary equipment which could be substituted. It is important to follow the raw materials

costs: copper and LiB are of special concern. The location of Gigafactory and the market size in the US should prevent significant difficulties in supply, but it does not exclude supply-demand fluctuations for the battery market (Roland Berger 2017:13). Hence, the relationships with the suppliers do not constitute a specific stress factor.

### **Bargaining power of buyers**

Innovative transformation of the automotive industry follows the new dimensions of customer value. Traditional value perceptions of car ownership and mobility are already changing significantly for early adopters. Customer values for most consumers are also in transition, they are segmented and underassessed (Keränen & Jalkala 2011), and combining this with the dynamic market development makes the likelihood of changes very high. Subsidies and incentives are currently required to change the value perception for the majority of consumers. Therefore, the **bargaining power of consumers** is high now and the consumer values and demand are prone to change. It should be considered as *a stress factor*.

### **Intensity of Rivalry**

The competitive rivalry is getting more intense with new models hitting the market. The main indicator could be the portion of the market share. Looking at this topic it is also rational to consider the current Tesla's Gen. 3 main competition not the other EVs like Chevy Bolt or Nissan Leaf but the relevant ICE high-end cars like Audi, BMW, Mercedes (Forbes, 2015:3) Many scenarios, however, predict the exponential growth of the EV market from 2019-2020 onwards (International Energy Agency 2017). Assuming the current high rates of market growth will accelerate, the competitive rivalry is limited. The opposite is true if we see some cyclic EV market slow-down due to higher battery costs or other reasons. Such uncertainty contributes to *competitive rivalry being a stress factor*.

## **4.4 INTERMEDIATE RESULTS**

### **4.4.1 Collection of results**

Tesla's Business Model holds the unique combination of the value drivers and the disruptive characteristics. It has received a great market appraisal for its strength and future cash flow promises. Its innovative characteristics propel the high market valuation among the automotive companies supported by innovation premiums and not the other factors like historic returns on ROA or ROI.

Throughout the collection process it is important to focus on the changing conditions that have implications to the BM. The following results are collected: new entrants entry, competitive rivalry, bargaining power of consumers are considered to be the stress-factors.

#### **4.4.2 Results evaluation**

The strengths of Tesla's Business Model could be explained by the innovative and disruptive characteristics of the BM. These strengths facilitate the disruption of the ICE market. Both the BM components and the BM alignment are critical for the innovative and disruptive effects. The disruptive properties of EVs are also confirmed by the rapid market share growth of EVs.

#### **4.5 Required changes and strategic action**

Setting up the strategic priorities and formulating the initial change actions it would be wise to start with the most important causes.

In Porter's view "the trends carrying the highest priority from a strategic standpoint are those that affect the most important sources of competition in the industry and those that elevate new causes to the forefront" (Porter 1979:144)

By applying this strategic paradigm, we can concentrate on disruptive and innovative changes to the BM. Special attention should be dedicated to BM changes linked to disruption. For example, we can observe some value proposition discontinuity between the current state and the next state (2.0). The value offer fit for the premium EV segment would be perceived otherwise when applied for EV mass-market. Emotional appeal vs. cost-benefit analysis, price-driven customer choice, and quality assessment will constitute the differences.

Two-fold action is proposed when making some changes to a BM. First, a translation of the existing business model into its logic patterns and choices. Managers need to check the how those current assumptions and choices fit to the current context and how would they fit to the modelled next state. Based on the results of the assessment they can reconfigure or innovate their Business Model.

Amit & Zott (2012) have named four of the following interlinked value drivers worth considering when **innovating** a BM:

- a) Novelty*
- b) Lock-in*
- c) Complementarities*
- d) Efficiency*

This study could identify the following innovative value drivers and propose the combination of the value drivers:

**Lock-in:**

Fast charging 120KW standard is used at Superchargers. Other chargers are significantly slower. Interchangeability is limited and there's a possibility to attract new EV customers from different EV brands.

**Complementarities**

Connectivity and autopilot features in Tesla Vehicles. Charging stations might add extra partnership amenities nearby (cafes, sport facilities, farmers markets etc.) to seize additional value off the EV users.

**Efficiency**

New customer relationships created through Tesla sales of new vehicles might be used for other revenue sources.

Innovation of Business Models could also be facilitated by answering these 6 questions, initially raised by Amit & Zott (2010):

- 1) What is the objective of a new business model? What perceived needs would be satisfied through the design of a new activity system?

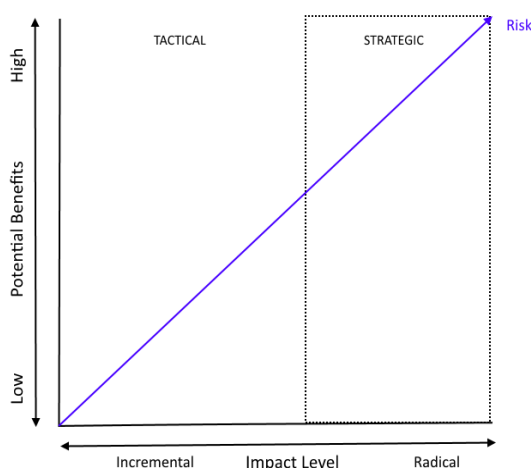
- 2) What novel activities are needed to satisfy the perceived needs? (Business model *content*.)
- 3) How could these activities be linked to each other in novel ways? (Business model structure.)
- 4) Who should perform each of the activities that are part of the business model (e.g. the focal firm, or a partner), and what novel governments arrangements could enable this structure? (Business model *governance*.)
- 5) How is value created through the novel business model for each of the partners?
- 6) What focal's firm revenue will allow it to appropriate part of the value created from the new business model? (Adopted from Amit & Zott 2010:12)

The proposed innovation formula is the following:

*Answering the changes in customer values through the existing resources and the current partnerships, extending the strategic alignment of the BM components, addressing the cost structures (assisted by the volume and the experience-related efficiencies) and looking for some innovative changes in the company's customer channels and opening the new customer segments.*

**4.6 Business Model Impact** Managers need to estimate their BM change impact and understand the key trade-off of interrelated risks vs. relevant benefits. The essence of the key trade-off is that the more radical is the change of the BM - the higher are the potential risks and the perceived benefits should be significantly higher. The Figure

8 depicts the possible change impacts to the BM.



**Figure 8** BM Change Impact

#### 4.6.1 Tesla's Business Model Change contingencies

This study will further communicate a set of questions and will make some forward looking statements and will suggest the BM change contingencies.

**Q1:** Should the company continue to compete based on a perceived value or change to value propositions aligned to a cost-based value structure?

**A1:** Perceived value is probably the best bet for Tesla because of its current brand strength, CPV indicators and the chosen trajectory. Tesla started with high-end luxury niche product and it is expanding top-down to the economy sedan market. The likely benefits of the economies of scale and the experience curve effects could support the viability of this cause. Value propositions should resonate through comparisons on perceived customer value and competitive offerings.

**Q2:** What are the possible changes to the revenue streams components in the BM?

**A2:** Chen & Perez (2015) advise these possible business activity expansion areas:

- a) Mobility service
- b) Connectivity service
- c) Energy service

Adding extra activities should have implications to the other components of the BM. These changes could also mean creating some new partnerships with the network providers or energy companies and so change would be absorbed not only to BM components, but also to the external relationships.

**Q3:** How radical could be the changes to Tesla's BM?

**A3:** There are two options for changing the current Tesla's BM:

- a) Business model *adaptation* to various market conditions worldwide to expand to high-potentials.

Accenture (2016) report had identified several countries like Sweden, Germany, Canada, France, South Korea that qualify for EV *Best Potentials*. In order to expand to Best Potential markets Tesla's Business Model has to adapted. It needs to be tailored not just to EU market import conditions, but to specific countries due to the

regional differences in incentives (Slovik & Lutsey 2016), market deviations in CPV, electricity prices, changing conditions, and other specific factors.

b) Business model *innovation* aimed to be fit for mass-rollout, with the question to decide what matters to the customers the most, with the objectives to deliver superior value and to counteract the competitors. As of today the EV tax credits, incentives and subsidies currently play a big role in a competitive setting.

The next Table 5 reflects the Average Sales Prices (or ASPs) of Model 3 vs. competitors (premium sedan, compact premium). The company could identify the key sales areas, keep its flat pricing structure, but unlock value complementarities with the new customer relationships.

#### **Table 5 INSERT**

##### **Table 5 Model 3 Competition**

Two of the columns reflect the Average Sales Price for the comparable vehicles on the US market with and without tax incentives. If the current assumptions about the main competitors of Tesla's Model 3 are correct, we have to primarily compare the vehicle not to the other EVs like BMW i3 or GM Bolt but to ICE premium sedan and small premium sedan competition. Standard Model 3 ASP after US tax credit is lower than Toyota Camry XLE and lower than its European counterparts. If the incentives change substantially there would be no effects on the ICE vehicles but the Tesla's value propositions would be reconsidered.

#### **Pains**

Facilitating a BM change managers should draw conclusions on how such changes can be achieved and align these changes with their value markers and performance objectives. Therefore, managers can boost value creation by reducing customer "pains" (e.g. through the elimination of structural barriers). The expected CPV growth could enable to achieve the sales growth objectives. The Altman Vilandrie & Company survey (2016) shows customers are concerned about a lack of charging stations (85%) alongside with high costs (83%) and uncertainty over duration of



charge (74%). They refer to these barriers as the top customer reasons (pains) discouraging EV purchase. Thus, BM changes could be coincided with improved availability and better visual recognition of charging stations. In fact, Tesla had been moving in that direction and had already increased the number of supercharger stations to 790 as of 31.12.2016 from 582 stations on 31.12.2015 (Tesla 2017).

### **Growth on mass production**

Tesla should maintain the leadership position by:

a) developing new product propositions, optimization of customer value by increasing “gains” (new vehicle specifications and features);

Some markets are characterized by Early Adopters (or Visionaries) customers, and there could be Early Majority (or Pragmatists) customers in other markets so the value propositions must be differentiated for those respected markets.

b) reduce “pains” (lower costs, higher range, growing number of charging stations)

As for markets there will be a challenge to keep high yield markets and develop high potential markets. The appropriate indicators could be both market share and sales volume.

There are similar market predictions about Tesla’s strategic BM development path. “Tesla’s modus operandi is to sell highend cars in different car segments, and use the profits to realize greater efficiencies in the production and distribution process in order to bring down the unit price and expand its market share”. (Forbes, 2015:2)

The summary of change contingencies of with a dichotomy of Exploration focus (Company C1) vs. Exploitation focus (Company C2) where the trade-off choice shapes the change response are presented in the **Table 6**.

| <b>Dimension/<br/>Variable</b> | <b>Change<br/>Effect</b> | <b>Company C1<br/>reaction<br/>(exploration<br/>– innovation)</b>  | <b>USE<br/>Value<br/>C1</b> | <b>Company C2<br/>reaction<br/>(exploitation-<br/>stability)</b> | <b>USE<br/>Value<br/>C2</b> |
|--------------------------------|--------------------------|--|-----------------------------|--|-----------------------------|
| Environment                    | Initial Change response  | Opportunity  | Yes                         | Threat   | No                          |
| Self-organization              | New emergent properties  | Innovation   | Yes                         | Incremental, Controlling mechanisms                              | No                          |
| Reduction of Complexity        | Apprehension             | Differentiation, creation of new structures, testing new functions | No                          | Ladder structure, Unit size reduction, Delegation                | Yes                         |

|                           |                          |  |     |   |     |
|---------------------------|--------------------------|--|-----|---|-----|
| Reduction of Variability  | Variance reduction       | Innovation experiment, focus limitations, best outcome retention | No  | Standardization, Formalization of procedures, TQM | Yes |
| Multiplication of efforts | R&D alliances            | In-house core competences, Joint-venture battery                 | Mix | R&D Partnership with BMW                          | Yes |
| Direction of initiative   | Core competences         | Disperse, semi-autonomous, leadership                            | Mix | Top-down  | Yes |
| Learning                  | New skills and processes | Development  | Yes | Refinement  | Yes |
| Flexibility               | Responsiveness           | Customer focus   | Yes | Utilization of Key resources                      | Mix |
| Phase Characteristics     | Phase progress           | Customer differentiation   | Yes | Mass-production                                   | Yes |

**Table 6** Exploration vs. Exploitation contingencies

#### 4.7 Stress Test

Experimentation is an important function of the entrepreneur. However The function of the stress is to determine the ability of the BM to adaptively respond to the external context. The purpose of the stress-test is to validate the robustness (or strength) of a Business Model. The stress test can use the established stress factors and contain the variable (i.e. the trade-off resolution clause). The following **Table 7** shows the composition of the proposed stress-test.

|                              | <b>STRESS FACTOR</b> |                  |
|------------------------------|----------------------|------------------|
|                              | Trade-off choice     | Trade-off choice |
| <b>Key Partnerships</b>      |                      |                  |
| <b>Value proposition</b>     |                      |                  |
| <b>Channels</b>              |                      |                  |
| <b>Key Resources</b>         |                      |                  |
| <b>Key Activities</b>        |                      |                  |
| <b>Customer segments</b>     |                      |                  |
| <b>Customer relationship</b> |                      |                  |
| <b>Cost structure</b>        |                      |                  |
| <b>Revenue Streams</b>       |                      |                  |

**Table 7** Stress Test composition

### 4.7.1 Stress test results

|                              | New Entrants Entry |              |
|------------------------------|--------------------|--------------|
|                              | Explorative        | Exploitative |
| <b>Key Partnerships</b>      | ADAPT              | FIT          |
| <b>Value proposition</b>     | INNOVATE           | ADAPT        |
| <b>Channels</b>              | ADAPT              | ADAPT        |
| <b>Key Resources</b>         | ADAPT              | FIT          |
| <b>Key Activities</b>        | FIT                | FIT          |
| <b>Customer segments</b>     | ADAPT              | ADAPT        |
| <b>Customer relationship</b> | INNOVATE           | ADAPT        |
| <b>Cost structure</b>        | ADAPT              | ADAPT        |
| <b>Revenue Streams</b>       | ADAPT              | ADAPT        |

**Table 8** Stress test result

**Table 9** INSERT

**Table 10** INSERT

Perfectly adapted components are marked with green, the components needed to be changed are red, components that require attention are orange.

### 4.7.3 Heat Map

After doing several consecutive stress tests the heat map could be comprised.

|                              | Government Subsidies (external) |                              | Manufacturing Inefficiencies (internal) |              | New technological demands (Innovative)   |              |
|------------------------------|---------------------------------|------------------------------|---|--------------|--|--------------|
|                              | Changed                         | Phased out                   | Undercapacity                           | Overcapacity | via Partnership                          | via Supplier |
| <b>Key Partnerships</b>      |                                 |                              |   |              | Key Partnerships need to be reconsidered |              |
| <b>Value proposition</b>     | Accomodate ch                   | Current CVP unfit            |   |              |  |              |
| <b>Channels</b>              |                                 |                              |   |              |  |              |
| <b>Key Resources</b>         |                                 |                              |   |              |  |              |
| <b>Key Activities</b>        |                                 |                              |   |              |  |              |
| <b>Customer Segments</b>     |                                 | Shift to a different segment |   |              |  |              |
| <b>Customer Relationship</b> |                                 |                              |   |              |  |              |
| <b>Cost structure</b>        |                                 |                              |   |              |  |              |
| <b>Revenue Streams</b>       |                                 | Sales volumes can be reduced |   |              |  |              |

## Table 11 BM Heat Map

The BM components could be compared across the contingencies. This process should facilitate the appropriate managerial choices and the BM fit to those conditions. Several stress factors might be pulled together as a scenario. The Heat Map also counteracts the attention deficits prompting the directed rehearsal and adaptation of the affected components. The Heat Map analysis serves the experimental imitation function without the cost of trial and error.

### 4.8 Value dimension

Managers should initially select the appropriate method for value assessment including a CPV measurement to make longitudinal comparisons of the business model changes and outcomes. (Keränen and Jalkala, 2011). Several options are available for EV manufacturers depending on their marketing strategies and current BMs. For instance, the objectifying of *rankings* and *preferences* (state-of-practice study in business markets) would correspond to a firm's objectives is to obtain the leadership position for range, customer satisfaction, or brand image. Maximizing effectiveness would advise cost-driven value assessment approach. There are also some combinatory measurements specific for the automotive industry aimed for cross-competitive analysis, for example, "price for range" (price-per-mile of range) valuation. This type of measurement could discriminate the EV manufacturers with the smallest batteries.

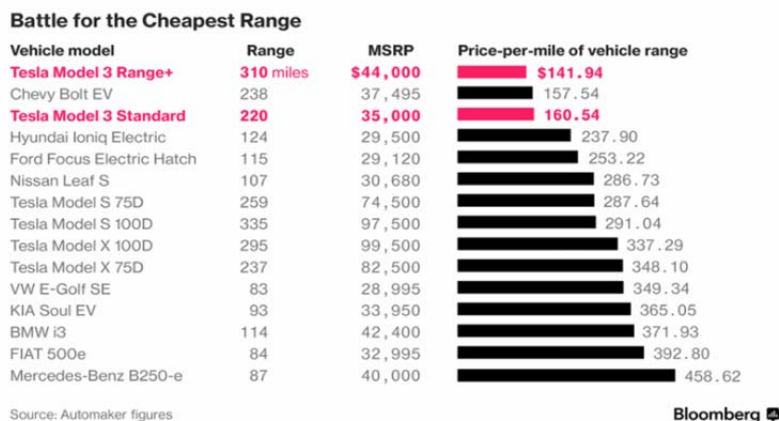
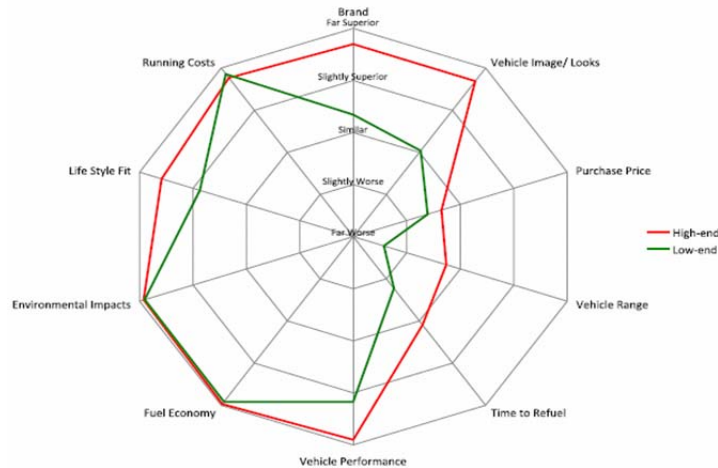


Figure 9 EV Price-per-Mile ratio (adopted from Bloomberg 2017b)

The research by Amini et al. (2014) applied a radar chart as a measuring instrument for analyzing the CPV changes in a time frame. The study by Hardman et al. (2016) has suggested a possibility of the assessment of EV Value dimensions using 10-axis attributes. It employs a spider-web diagram and includes the following axes:

- Brand
- Vehicle image / Looks
- Purchase price
- Vehicle range
- Time to refuel
- Vehicle performance
- Fuel economy
- Environmental impacts
- Life Style Fit
- Running costs.



**Figure 10** 10-Axis CPV Assessment (source: Hardman et al. 2016:48)

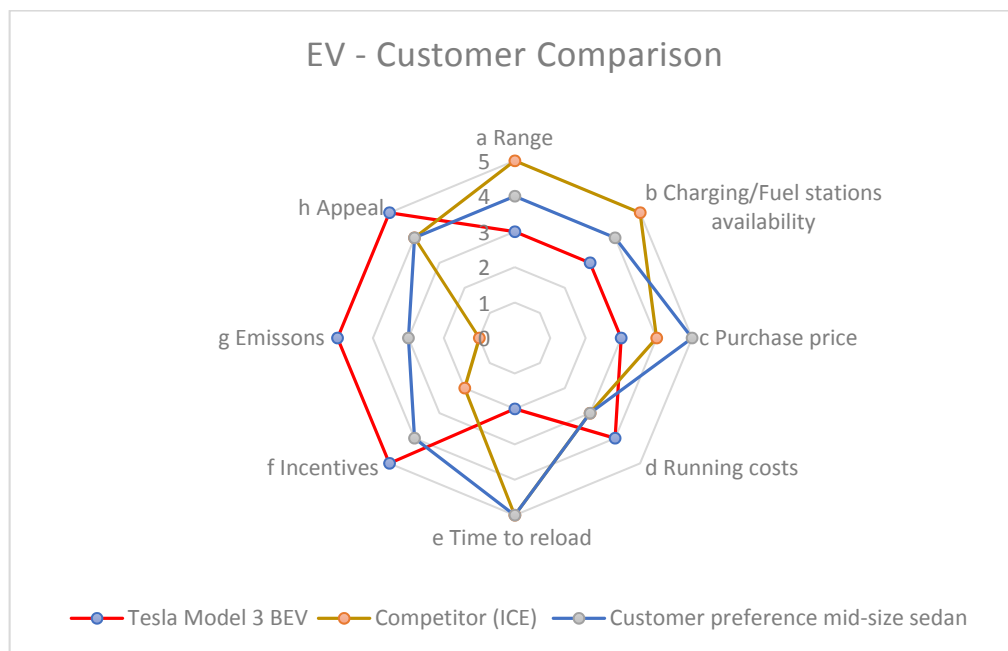
According to Hardman et al. (2016:50) there are sizable differences between hi-end and low-end in the customer vehicle value attributes that Tesla's BM should take into consideration. The 'low-end' customers perceive the smallest current value of EVs in the vehicle range, recharging time and the purchase price. The highest gap in the mean scores for brand, image look, and vehicle performance between low-end and hi-end could be expressed graphically for better apprehension. Little or no change is expected in such dimensions as environmental impacts, running costs or fuel economy.

Practical research has implicated other important EV value dimensions (or barriers), for instance, the availability of charging stations or EV reliability (National Academy of Sciences, 2015:38, 47).

This study suggests the following **8 attributes** axis:

- Range
- Charging /Fuel stations availability
- Purchase price
- Running costs
- Time to reload
- Incentives
- Emissions
- Appeal

This simulation of EV Customer Value comparison is completed as a radar chart.



**Figure 11** EV Customer Comparison

This Figure 9 reflects the perceived value differences that can be apprehended by a business model. It is rational to map and follow the deviations of CPV and customer expectations for a long time as customer values are quite stable in a short term. The proximity to the customer's ideal state and, more importantly, the large differences from the ideal state suggest the possible action steps and some specific business model revisions. The business model adaptation should address the customer

concerns alongside with the product improvements in order to close the gap between customer expectations and the current value proposition in either ways.

The analysis could be done by assessing the distances between the nodes. This chart does not reflect the relative weight of the value attributes, but it provides the strategic insights and could serve as the antecedent for the appropriate action. For instance, when a company observes the biggest gap (the farthest distance) between its current offering and the customer preferred 'time to reload' dimension it can align the changes in the BM in that direction. Vice versa, when the current offerings in appeal axis overshoot the customer preferences by two nodes they can be exploited. The practical interface could be facilitated through customer relationship, product improvements, channels or through the efficiencies in a cost structure of the BM.

#### **4.9 Research Summary**

Initially, the viability of the causes is established through the assessment of the environmental conditions and the relationship to the BM components. Some of the possible change factors are identified as *competitive rivalry*, *new entrants*, and *consumer power*. As predicted, the innovative change to the BM has the most disruptive properties, it affects the most BM components according to the stress test results. A single stress factor can have multiple outcomes and affect different BM components. When initiating or coping with change managers must consider the interplay (or alignment) of the different BM components. The research uses arises from a combination of experimental and simulation approach (stress test method), suitable to explore the contingencies and the model states spaced out from each other on a time frame.

## **5. ANALYSIS and EVALUATION**

### **5.1 The Business Model Adaptation and Innovation**

#### **Optimization, adaptation and Innovation of Business Models. Systems advise.**

A company's business model change (both adaptation and innovation) can also be assessed from a dynamic systems perspective. When managers initially think about apprehending rapid and dynamic changes in a systematic way our logic advises us

that we create some universal systemic function, reducing uncertainty and by addressing change and complexity with systemic formalization and structure. Schreyögg & Sydow (2010) reasonably argue that “*organizations can never fully understand their complex environment and therefore have to model uncertainty and complexity to a template on which members can act*”. It is essential that we consider the systematic response to change when looking at the system through its elements, interconnections, and feedback loops, and a function or purpose (Meadows 2009:11).

### **Business Model conditioning**

Managers watching for change effects in the complex systems setting or those rehearsing their business models should concentrate on the following phenomenon: positive and negative feedback loops, strange attractors and multi-objective optimization practices. Managers should also be careful of the critical points where disturbances in one node would distress the whole system (e.g. the whole supply chain network). Inherently fluid and absolutely adaptive systems reacting to their dynamic environment in a not patterned way would dissolve in such environments and lose their internal direction. That is inappropriate for a business organization, which relies on direction and strategy.

### **Positive feedback implications for BM change**

Low awareness of EV technology that is considered the one of EV proliferation barriers (National Academy of Sciences 2015:50) could be offset by positive feedback coming from the EV market growth, hence this factor can lose its relevance faster than the other barriers where the counteracting feedback loops are not observed. Positive feedback must be checked against not to produce the adverse effects. The question here is to look for possible strange attractors in among the business model factors.

*“In a dynamic system, strange attractors (a specific attractor or key control parameter in a system that changes its value by an amount three times greater than the value in the previous cycle) produce massive effects in all the other components in the system; small causes can have massive (nonlinear) system-wide effects.”* (Spencer & Carlan 2008:269).

Innovative business models could benefit from a system phenomenon of path dependence which is prevalent in positive feedback dominated systems (Sterman



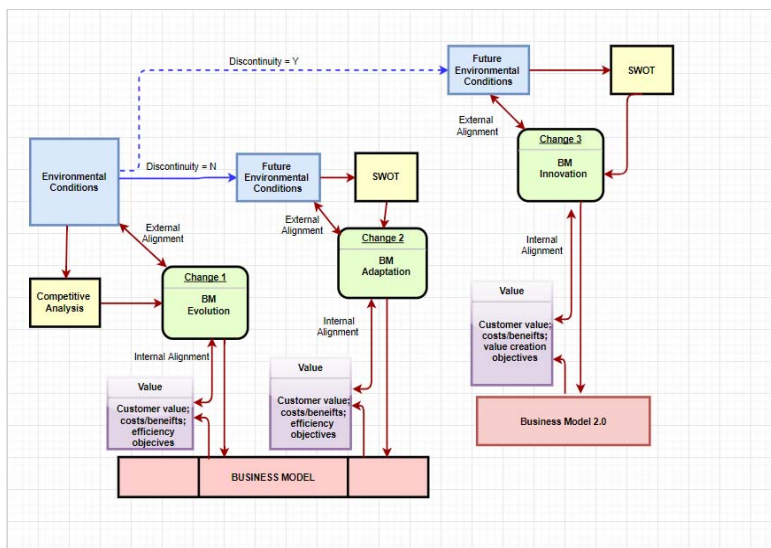
2000: 351). Setting the universal charging standard could be an example of *path dependence* for the EV manufacturer’s business model. The future growth of installations of that particular type would be contingent on that prior event.

### Negative feedback loops and BM change

In system theory, negative feedback loops in organizations are “internal control mechanisms which maintain systems in states of equilibrium”. (Spencer and Carlan 2008:279) The managerial task would be to find the such systemic state of equilibrium that is optimal for the given moment fitting with various internal and external alignments and coping with dynamic inputs.

### Other implications

Regulations and policies have an impact on BMs, especially on the markets where they have been identified as EV adoption factors (when they directly impact consumer attitudes and CPV of EVs) (Priessner et al. 2017:22). The following Figure 12 contains the visual summary of the proposed BM change methods (evolution, adaptation, and innovation):



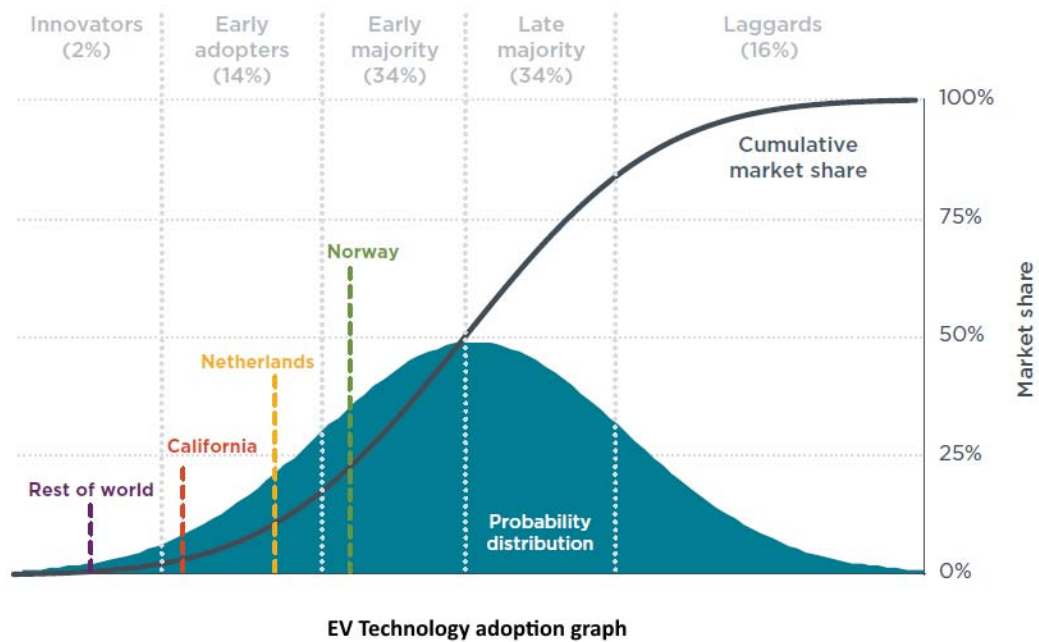
**Figure 12** Visualizations of BM Change Methods

## 5.2 Suggestions

### BM Component changes

The **value propositions** would include value assessment and cost-benefit comparison. The current value propositions (USP, and emotional appeal) are considered only partially fit for mass-adoption phase. The study by Hardman et al.

(2016) suggests the farthest CPV value deviations for brand, image look, and vehicle performance need to be adopted in a transition from the hi-end segment to mass market. Cost-conscious approach should be elaborated for the markets with early majority customers beyond the Early Adopters group. As it is depicted in the Figure 13 some regional markets are approaching Early Majority phase, hence the relevant components of the regional BMs must be adopted.



**Figure 13** EV Technology adoption graph (source: Slovik & Lutsey 2016:3)

This figure reflects the regular S-shaped market development. It can be applied as long as the innovative EV technology replaces ICE vehicles.

The **key activities** component should be amended with leasing. The leasing rates of Tesla are currently low compared to Nissan or Ford. Although it reflects the currently affluent customer base, in order to facilitate a trying customer mode without binding commitment in the next state the key partnership with a leasing company is proposed.

**Customer data** should be considered as the other **key resource** in the model state 2.0. As the number of sales (and direct relationships) grows, the customer data at scale would be helpful in additional value extraction.

A **retail channel** is only suggested if there is a risk of manufacturing overcapacity. If there are any volumes of Build-to-Stock (BTS) vehicles they can be sold over some designated dealers (or leasing companies). Assuming there is a long waiting list of reservations for Model 3 up to mid-2018 it should not be a problem for the short-term.

Tesla's core competition would be different for Model 3 compared to Model S or Model X. Those changes to **customer segments** (from luxury to premium sedan and small premium) have to be accommodated in the BM 2.0. The Table 12 provides an overview of the competitive offerings concerning Tesla Model 3.

#### TABLE 12 INSERT

With some measures taken to reduce the manufacturing complexity Tesla 3 currently has a limited number of configurations (less than 100 compared to over 1500 for Model S) (Electrek 2017). Eventually, this study perceives **more software personalization** and **less product customization** for Model 3 vehicles.

As for **revenue streams**, there are suggestions to expand with club membership payments and networking fees.

The highest gap in the mean scores for brand, image look, and vehicle performance between low-end and hi-end could be expressed graphically for better apprehension.

The changes in the BM state 2.0 are compared with the BM state 1.0 and the findings are summarized in the next **Table 13**.

|                    |   |   |   |                                    |
|--------------------|---|---|---|------------------------------------|
| <b>Product</b>     | <b>Key activities</b>   | a) Product R&D (EV)<br>b) EV Manufacturing<br>c) EV Sales d) Charging network | a, b, c, d + Leasing  |                                    |
|                    | <b>Value Propositions</b>                                     | USP, emotional appeal to early adopters, hi-end.                              | + cost-benefit comparison<br>+ value assessment             |                                    |
| <b>Environment</b> | <b>Key Partners</b>   | Panasonic, Borg-Warner  | + Leasing company   |                                    |
|                    | <b>Key Resources</b><br>Core Competencies<br>Strategic assets | Brand, Design, Customer base, Gigafactory, Webpage, Charging Network          | Customer data   |                                    |
| <b>Customers</b>   | <b>Channels</b>   | Prebooking, direct sales to end-users, global importers                       | Web, showrooms, service centers, Direct importers           | + retail                           |
|                    | <b>Customer segments</b>                                      | Individually segmented, Luxury  | Segmented, Premium sedan, Premium SUV                       | + Mid-size<br>+ SUV<br>Mass Market |
|                    | <b>Customer relationships</b>                                 | Personalization of EV, Toll-free, software                                    | Less product customization<br>More software personalization |                                    |
| <b>Finance</b>     | <b>Revenue streams</b>  | EV sales, battery storage, service, upgrades                                  | Club memberships payments, networking fees                  |                                    |
|                    | <b>Cost structure</b>   | Materials, Labor, Capex, R&D  |   |                                    |

**Table 13** Tesla Business Model 2.0

### 5.3 Interpretation and Discussion

*To rely on rustics and not prepare is the greatest of crimes; to be prepared beforehand for any contingency is the greatest of virtues” - Sun Tzu*

(McNeilly 1996:78)

After combining the theoretical framework and the research results this Thesis has derived with the following inferences. In order to sufficiently disrupt the automotive industry Tesla needs to shift to high volume, mass production, by attracting more new customers with their value concepts quite different from the current Tesla-loyal yearly EV adopter customer base. Hence, the Tesla’s current business model will be impacted.

*TH.1 The appropriate adaptive reactions type for a firm in a dynamic environment are: evolution, adaptation and innovation of the company’s business model.*

The Hypothesis 1 is confirmed. Changing business models via evolution, adaptation and innovation is a relevant method for achieving external alignment to the dynamic environment. The perpetrated alignment of a business models facilitates innovation and value appropriation especially in periods of change, high uncertainty and

volatility (Amit & Zott, 2010: 15). A specific BM change type depends on the planned outcome, the scope of change, the frequency of change, the degree of novelty and radicalness. (Saebi, 2014).

*RQ1. What if the automotive companies will be challenged by major disruptive changes in their competitive environment in the next 5 to 10 years, then how we can define the possible counteraction choices and their reflections in their BM components?*

Contemplating this research question the paper suggests a two-fold approach.

There are two generic options:

- a) To innovate its own disruptive business model;**
- b) To undermine the disruptor's business model.**

Assessment, deconstruction, analysis and innovation of the BM are those applicable tools for the first option (a). The innovative BM change is mediated through identification of the affected (stressed) and robust BM components. Modeling the innovative BM change response should address the customer needs, new activities and value configurations, revenue models rehearsal and new model alignment (Amit & Zott 2012:45).

As for the second alternative, to answer to a competitor's disruptive BM a firm could do a reliable assessment of the key BM components, initiate a BM stress-test and search for critical weaknesses in the competitor's business model. After that a company could induce some changes that targets the established weaknesses which could lead to fulfilling the second objective (b).

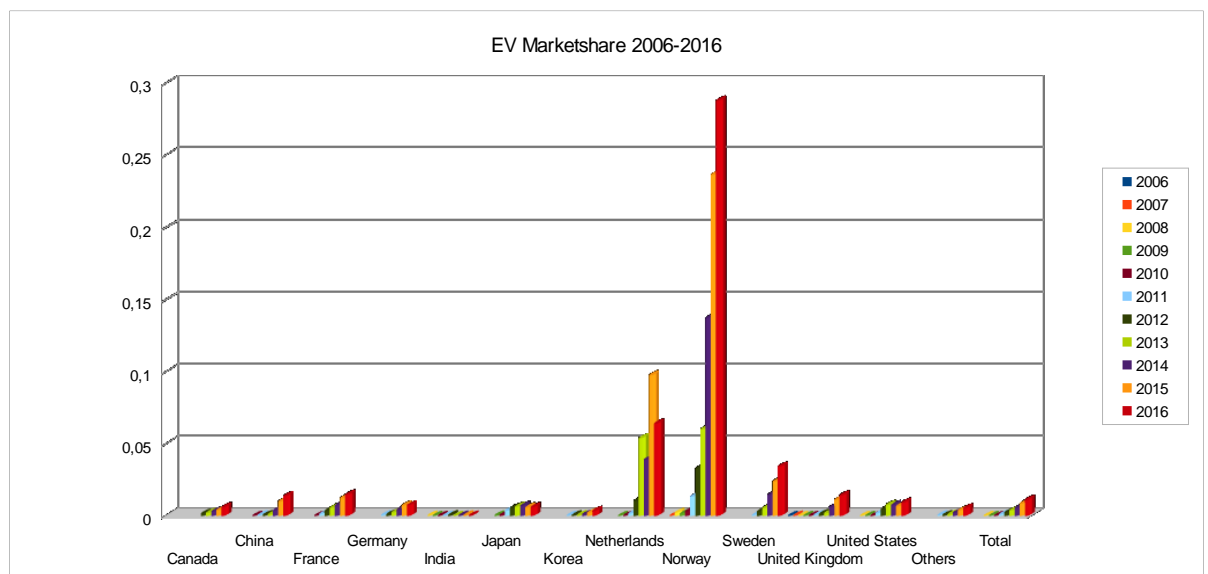
*RQ2. If we define the key managerial trade-off affected by change as a choice between:*

- a) **Exploitation** (productivity, cost focus, optimization & standardization pattern)*
- b) **Exploration** (value creation, growth and innovation pattern),*  
*which of the above patterns provide competitive advantage for the observed context (proliferation of EVs and related developments in the automotive industry)?*

As for the Research Question 2, it is shown that this key Exploitation-Exploration trade-off persists through many managerial choices. This problematic trade-off

between exploitation and exploration has the costs of choosing one option and also the costs of problem ignorance. There should be a change contingency assessment. If managers perceive some radical changes such as a discontinuity of the environment or customer value change they may opt for exploration mode.

Currently we see some clear signs of changing customer values and disruption in the automotive industry (the paradigm of mobility and ownership changes, the rapid EV market share growth and the demise of ICE technology). Both criterion call for explorative change. The regional differences in EV uptake have implications for the relevant business models.

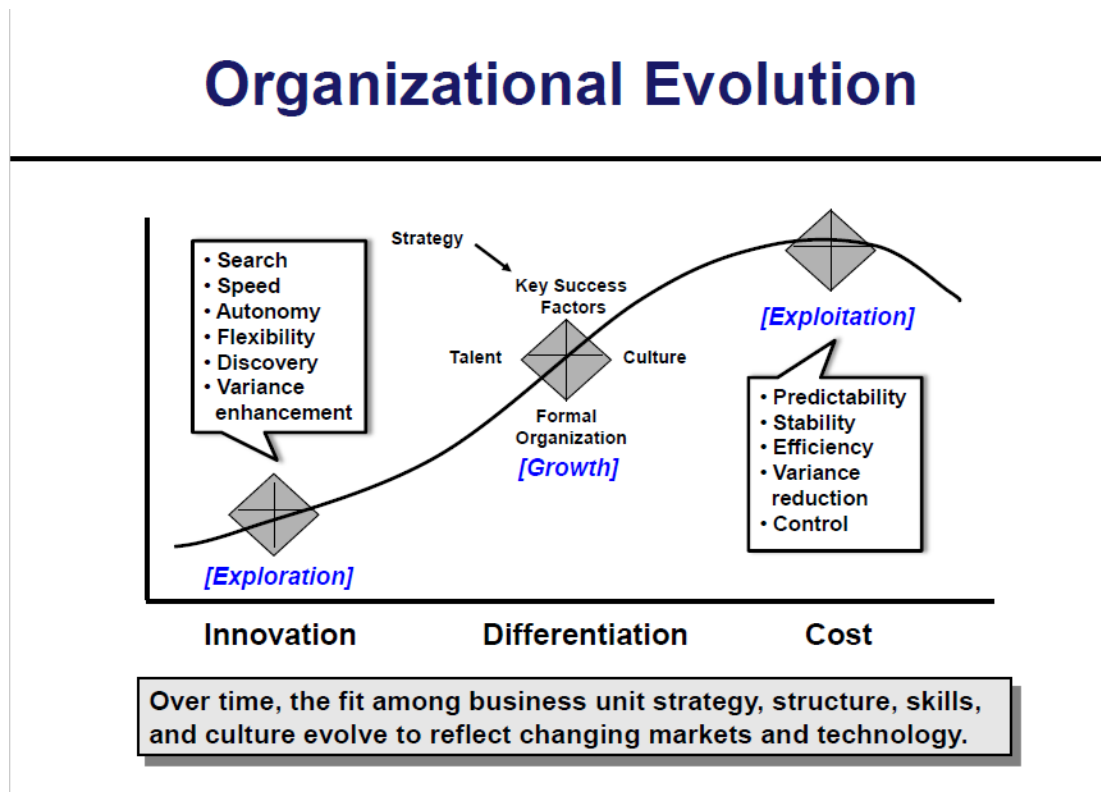


**Figure 14** Regional EV Market share 2006-2016

The EV manufacturer could identify the key markets based on the current EV market share, select the markets with the fastest rate of growth, or prepare the model to a possible EV technology diffusion on a large untapped market. The further development of EVs and the increasing number of EV body types logically increase competitiveness, but on the same time reduce customer dissatisfaction about the limited product variety and enable further customization. By using compassions or matrix techniques, we can identify the markets with the best potential either by the speed of change (the growth factors are in place – the EV growth should follow) or by the market size (see Accenture 2016 ‘best-in-class’) criteria that are fit for our explorative ventures.

There are qualitative and quotative indications that the global EV market is currently in its exploration phase with various deployment scenarios (International

Energy Agency 2017). As O'Reilly (2016) suggests (see Figure 12), variability, flexibility and innovation are the key factors for an organizational response at this stage. Alongside with the market growth and maturity that could be a transformation to differentiation focus and a final shift to exploitation/cost focus. Managers need to be constantly sensing the market characteristics to shift their focus in time. The next Figure 15 visualizes three different stages of the business alignment and can suggest the BM development path.



**Figure 15** Organizational Evolution (adopted from O'Reilly 2016)

When our EV market will progress with increased adoption and reaches its fast growth stage it would be essential for companies to differentiate activities and products with their business models. The particularly high regional EV adoption rates could indicate the advanced EV market development stage and hence necessitate a specific alignment and adaptation of a business model. The increasing instability and unpredictable environmental conditions provide more reasons for *innovation*. There are some available adaptive tools to counteract the market fluctuations (not trends), for example, a cost-conscious flexibility.

**RQ3** *When we identify two of the following optional responses to environmental change as **adaptation and innovation** (creation, emergence), which one fits the given complex, dynamic, and unpredictable environmental conditions better?*

Such environmental dynamics and a context uncertainty create conditions for the continuous rehearsal of the BM. The exact type of the BM change can be determined by the BM reassessment and other environmental appraisal tools (SWOT analysis, PESTEL). Specific threats to the core competences, or the discovered vulnerabilities in the BM advocate for innovation BM change.

## **6. CONCLUSION**

### **6.1 The Summary of Key Findings**

Essentially, managers must solve a dilemma (or a trade-off) between exploration and exploitation when adopting or innovating their business model. Some mechanisms of doing both (like ambidexterity) were proposed in the literature and have been tried in practice, though they have limitations.

This study proposes innovative change to a firm's BM (over BM evolution or adaptation) when there is an environmental discontinuity in the future, and hence the current BM would be certainly unfit to the next conditions. Special attention should be dedicated to competency destroying inventions. Companies must reconsider the familiar pattern of reference and their BM framework if the context changes. Fully informed reasoning and a cautious holistic approach with all the necessary regards to the established constraints (costs, value/quality and time) should be applied when choosing to implement changes to a company's business model.

### **6.2 Theoretical contributions**

When coping with change managers are confronted with reality that there is no single remedy solution, due to the variety of factors, environmental complexity and uncertainty, the degree and the speed of change. In such dynamic conditions an effective model could provide a frame of reference that encompasses value dimensions and enables comparisons and analysis. BM change model compliments the existing studies with the insights about BM adaptation and innovation and it has



practical use for the automotive industry and for the EV manufacturers. BM framework enables the managers with the choice contingencies, facilitates innovation, helping them to unwise synergies, utilize positive feedbacks, uncover hidden value. There is still a gap between the theoretical BM concepts, practical tools and managerial choices and this Thesis makes a step to close this gap. The larger goal of the BM change approach is the effective facilitation of the managers' decisions through purposeful alignment of all the model components and the encompassing value reference. This model reasoning could be scaled further and thereafter produce benefits for a wide range of companies. BM adaptations and innovation capabilities are especially useful for our growing global EV market with little historical data, much uncertainty and high potential.

The main outcomes of the successful and adapted business models should be:

- a) (a) *facilitation of managerial choices*;
- b) (an) *effective trade-offs resolution*.

### **6.3 Measurements and conditions**

Costs reflections are not very good story tellers. Analyzing the dynamic system change we should not rely merely on financials costs factors (R&D costs, investments) but put much effort for assessing customer value. Massive R&D spending could mean creating a new product, but the product's success on the market depends on many other factors including a strong BM. There should be some compensation for a time lag when managerial choices and their outcomes are spaced from each other in time. evolution or adaptation

There are specific indicators *when* managers need to solve this problem and should innovate their current BM:

- a) *Disruption of the environment* in which the company curtails its competitive advantage;
- b) *Customer value change* (when there is a formation of a new market segment; or when our customers want something different and drive forward inventions).

Another useful implication for the companies is to develop their abilities for sensing and analyzing value. There are several practical tools such as a graphic assessment of CPV deviations and the other customer value dimension changes. This work recommends the following applicable tools: an analysis of the conditions and interrelationships in a firm's environment, competitive evaluation (using Porter's Five-forces framework). Some indicative early warning of the potential BM vulnerabilities (BM stress-test) prerequisite is suggested.

#### **6.4 Practical contributions**

Based on the case study, business model change approach can be successfully applied to those companies operating in early stages of market development or for firms facing distraction (both preconditions effectively apply to the EV segment of the automotive industry). This would necessitate in reformulation of the company's value proposition and adapting or innovating the Tesla's current BM. Value propositions, distribution channels, customer segments are the main areas where those changes need to be adsorbed. Those currently successful automotive companies perfectly fit to the present environment relying on their previous business models without adapting them to the growing EV market demands might hold themselves hostages of their own inertia and rigidity.

#### **6.4 Study limitations**

At first, this work is focused on the adaptive response in the dynamically changing conditions and hence it has limited practical use for those perfectly fit companies in their stable and mature market environments. Secondly, there are limitations of the study due to the applied method and model design. It is hard to excerpt a single variable off the complete model alignment to test and replicate the results in a different business arrangement. The stress test method used in the practical part has been relatively novel for BM change simulations and the industry diffusion of the method for BM testing is scarce. The study was conducted from the EV

manufacturer's perspective and those discussed choice contingencies could be context-bound.

### **6.5 Future research**

The analysis of differences between the base and the adapted model states calls for a longitudinal research on the specific adaptive changes. Small incremental adaptive changes can be assessed only with a time lag. Data analysis and statistical confirmation of the BM change between the two states through dependent variables have more potential. Since the success of the business model is also contingent on the alignment of the BM elements future research should also elaborate on efficiency of their value creation and value seizing functions in two distinct settings: exploitative and explorative.

Additionally, it would be beneficial to directly study the relationship between the multiple elements of CPV/TEV (brand, appeal, costs) with the transaction platforms dimension and the coherence factors in the EV manufacturer's business model components.

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