

The impact of innovation on industry structure change

“A study on how the transition from ICE to EV vehicles impacts car dealerships in the Dutch automotive industry”

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Preface

Dear reader,

Before you lies the master thesis “the impact of innovation on industry structure change” This thesis is written for the Master of Science in Business Administration with specialisation in Strategic Management at Radboud University in Nijmegen. I was engaged in researching and writing this thesis from January to June 2022.

Because of my interests and work experience in the automotive industry, I decided to research the topic of this thesis in this environment. The automotive industry was suited for this research as it is currently undergoing a transition because of an innovation (the electric vehicle).

I got more excited for this research when listening to the podcast of Emeritus Professor Doctor Maarten van Rossem. In this podcast the subject of disruptive technologies was mentioned. It was stated that all industries are dealing with disruptive technologies except for the automotive industry, but that will come. To which Emeritus prof. dr. van Rossem answered: 'That is the electric vehicle, isn't it?' (van Rossem, 2021). This made me curious about the change to an electric vehicle automotive industry and whether this innovation is a disruptive innovation or not.

Two years ago, I wrote my last thesis at the Higher Vocational Education. This thesis was my first thesis at university level. Therefore, writing this thesis was more challenging for me as I was not used to write a scientific thesis.

I could not have written this thesis without help from others. Firstly, I would like to thank dr. ir. Gerrit Willem Ziggers for guiding me in the process and giving me useful feedback and advise. Secondly, I would like to thank my thesis circle group. They also gave useful feedback and advise while writing this thesis. I would also like to thank my connections in the automotive industry. These connections helped me to reach the desired target group for conducting interviews. Lastly, I would like to thank the interview participants for participating in this research, without their participation I would not have been able to conduct this research.

I hope you enjoy your reading.

Casper van Swam

Gassel, June 10, 2022

Abstract

Environmental requirements set for changes and innovations in various sectors. The Dutch government has set a target to achieve a carbon dioxide emission reduction of 49%. To be able to achieve this target different industries have to innovate. One of the industries that has to innovate according to this target is the Dutch automotive industry. The automotive industry is currently experiencing innovation because of the transition from ICE vehicles to electric vehicles. This research therefore examined the impact of this innovation on the industry structure and the changes it entails.

The necessary data for this research was collected by conducting semi-structured interviews at different car dealerships within the Dutch automotive industry. The expected outcome of this research was that the extent of innovation has an impact in the extent of industry structure change. Hypothesised was that companies that experience a greater extent of innovation, also experience a greater extent of industry structure change.’ This change in industry structure was mapped by changes in core activities and core assets.

The findings of this research show that the extent of innovation has an impact on the extent of industry structure change in the automotive industry. A higher extent of innovation leads to a higher extent of industry structure change. Car dealerships that experience little extent of innovation also experience little extent of change and companies that experience a high extent of innovation also experience a higher extent of change. This higher extent of change can be seen as these car dealerships need to restructure their core activities because of threats for obsolescence. The difference in extent of innovation can be explained by a difference in adaptability to innovation. Car dealerships that have already experienced a high extent of innovation have adapted to innovation earlier and are therefore ahead in transition compared to car dealerships that have experienced little innovation in the transition to an EV automotive industry.

This research contributed to the knowledge on how industry structures change by stating that not only the type of innovation (McGahan, 2004) defines the extent of industry structure change, but that the extent of innovation also has an impact on the extent of industry structure change.

Keywords: innovation, change trajectories, industry structure, automotive industry, adaptability

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1. Introduction

In 2016, State Secretary Dijksma signed the UN Climate Agreement in Paris on behalf of the 28 member states of the European Union (Ministerie van Infrastructuur en Waterstaat, n.d.). The target of this agreement is to limit the global temperature rise to well below 2 degrees Celsius. In the Netherlands, measures are being taken that prepare for a 49 percent carbon dioxide reduction by 2030. In the Dutch Coalition Agreement of 2017, the coalition decided that carbon dioxide reduction in the transport sector must be achieved through: ‘more economical tires’, ‘European standards’, ‘electric cars’, ‘biofuels’ and ‘measures in cities’ (VVD, CDA, D66, & ChristenUnie, 2017). In this Coalition Agreement, the Dutch government has decided that car dealerships are only allowed to sell new emission free (electric) vehicles from 2030 on and only sell emission free vehicles (new and used) from 2050 on. This causes disruption in the automotive industry, as car dealerships are no longer allowed to sell new vehicles with an internal combustion engine (ICE). Therefore, the number of ICE vehicles will decrease and the number of electric vehicles will increase. The major research agencies (Bloomberg, Internationale Energie Agentschap, PwC, McKinsey and for the Dutch market Rabobank, ING and Ecofys) are almost unanimous of the opinion that the electric vehicle will completely replace the traditional vehicle with combustion engine (VMS Insight, 2018).

Since this transition has not yet been completed and is ongoing today, it remains a relevant topic for research. The automotive industry is impacted by this transition because of the need to change in the period between 2017 and 2050. Despite the fact that the transition to an electric automotive industry is currently very relevant, research on this transition is not new. Previous studies have focused on how car manufacturers are responding to the transition from ICE vehicles to electric vehicles. An example is the paper of Aggeri, Elmquist & Pohl (2009) ‘Managing learning in the automotive industry – the innovation race for electric vehicles’. In this article the authors describe how electrification (the main focus for most car manufacturers) implies large changes both in terms of vehicle changes and usage of business models. Additionally, the authors describe how literature on discontinuous innovation (disruptive) proposes learning as a crucial capability and describe there are few empirical studies on how this actually happens in firms. The paper of Aggeri et al. (2009) contributes to understanding how automotive companies deal with innovations. Because little research is conducted on how car dealerships are impacted by innovations, it is still relevant to research this topic in that research context.

In order to be able to conduct research on the impact of innovations, knowledge must be gained about different types of innovation and the effect they have on industries. The popular work by Christensen (1997) on disruptive technology serves as a springboard to examine key issues concerning the effect of technological change on firms and industries (Danneels, 2004). Christensen's work on disruptive technology has been cited extensively by scholars working in diverse disciplines and topic areas, including new product development (NPD), marketing, strategy, management, technology management, and so forth. However, despite how widespread Christensen's work on disruptive innovation has become in business circles (Danneels, 2004), little research has been conducted on different innovation change trajectories in the management literature (McGahan, 2004).

In addition to the research of Christensen, Raynor & McDonald (2015) on disruptive and sustaining types of innovations, McGahan (2004) describes how different types of innovation have different effects on industry structure changes. When an industry is faced with a disruptive innovation, core assets and core activities within this industry will be threatened with obsolescence. These threats for obsolescence lead to a radical change trajectory. Within this radical change trajectory core assets and core activities in an industry need to be restructured. When an industry is faced with a sustaining innovation, core assets and core activities within this industry will not be threatened with obsolescence. This leads to a progressive change trajectory. Within a progressive change trajectory there is no need for core assets and core activity restructuring within this industry.

In recent years research has been conducted on different types of innovations (Christensen et al., 2015), the impact of different types of innovations on industry structure change (McGahan, 2004) and how innovations in the automotive industry imply large changes (Aggeri et al., 2009). However, there is a gap in literature as no research has been conducted on how the extent of innovation impacts the extent of industry structure change. This research aims to address this gap in literature by studying innovation and industry structure change within the transition in the automotive industry and examining whether there is a possible link between the extent innovation and the extent of industry structure change.

The objective of this paper is to gain insight in how the extent of innovation impacts the extent of industry structure change. A firm's strategy cannot succeed unless it is aligned with the industry's change trajectory (McGahan, 2004). When the extent of innovation has an impact of the extent of industry structure change, companies can take this into account when aligning their strategy with the industry structure change process. The variables that are being studied in

this research are: ‘innovation’ and ‘industry structure change’. The variable industry structure change is measured by: ‘changes in core assets’ and ‘change in core activities’. These variables will be examined in the context of the Dutch automotive industry. As the Dutch automotive industry does not have any large-scale car manufacturers, this research focuses on car dealerships. The setting in which these variables will be examined is how car dealerships are impacted by the transition from ICE vehicles to electric vehicles. This research contributes to the understanding how industry structures change when impacted by innovation.

Based on the above described objective and variables, the following research question arises:

How do innovation changes in core-assets and core-activities impact the structure of the automotive industry?

The variables in this study are ‘innovation’ and ‘industry structure change’. To get insight in the variables and the role they have in the research, the following sub questions are formulated:

1. *What is the automotive industry structure?*
2. *What is innovation change (transition)?*
3. *How does innovation change impact the automotive industry structure?*

In chapter 2 ‘theoretical background’ the theoretical concepts of this paper will be discussed. The concepts that will be discussed are: ‘the automotive industry structure, ‘innovation’ and ‘innovation change trajectories’. These concepts will give provide some theoretical background information needed to be able to answer the research question and sub-questions. In the final sub-chapter of chapter 2, the conceptual model of this paper is visualised. In chapter 3, the research methodology of this paper will be discussed. This chapter starts with describing the chosen research method and research context. After this the used data sources will be discussed. The operationalisation of the concepts within this research and data analysis procedure will be discussed next. This chapter ends by discussing the research ethics of this paper. In chapter 4 the results of the research are shown. The results are backed up by quotes of interviewed professionals in the automotive industry. In the fifth chapter, conclusions are drawn based on the results of the research. In the final chapter, ‘discussion’, the results of the study are interpreted. After this the contribution to theory and the practical implications of this study will be discussed. This chapter ends by discussing some research limitations and by mentioning some directions for further research.

2. Theoretical background

In this chapter an outline of the relevant theories will be further explained. Key concepts in this paper will be explained and their relationships will be clarified. First, this chapter will define the automotive industry structure, followed by the concept of innovation including types of innovation change. Next, industry structure change will be clarified in relation to core asset restructuring and core activity restructuring. Finally, this chapter provides a visual representation of the conceptual model of this research.

2.1 The automotive industry structure

Industry structure can be defined as the basic, underlying characteristics that shape the competitive strategy for a group of firms producing products that are close substitutes for each other (Porter, 1986). Industry structure is constantly undergoing modest adjustments and can occasionally change abruptly (Porter, 2007). These shifts in industry structure can sometimes come from outside an industry due to technological, environmental, customer or other developments. Shifts in industry structure can also come from within an industry. In these cases, choices made, or innovation can lead to a new developed industry structure.

2.1.1 Automotive industry value chain

In the article *Globalisation of the automotive industry: main features and trends*, Sturgeon, Memedovic, Biesebroek & Gereffi (2009) define the value chain of the automotive industry. This value chain starts with lead firms in the automotive industry (Sturgeon et al., 2009). These lead firms are known as car manufacturers or original equipment manufacturers. At these lead firms most aspects of product design, production of most engines and transmissions and nearly all vehicle assembly take place within their own facilities. These lead firms have substantial coordination and buying power within the value chain (Sturgeon et al., 2009). Lead firms are involved in five of seven levels within the automotive value chain. These levels are: 'design/ product development', 'raw materials', 'OEM (original equipment manufacturer) parts', 'OEM assembly' and 'marketing'. The first two levels: 'design/ product development' and 'raw materials' take place before production of the vehicles. In these levels vehicles are designed and developed and raw materials are sourced for production. The next level within the automotive value chain is 'OEM parts'. At this level parts of vehicles are produced. These parts include for example: 'bodies', 'electronics', 'mechanical components' and 'replacement parts'. The parts are used in the next level within the automotive value chain 'OEM assembly' where these parts are used to assemble vehicles. After assembly of vehicles, a marketing level within the automotive value chain creates national, regional, and local

marketing strategies. These marketing strategies are co-created with car dealerships who eventually distribute the vehicles to the end-users in the value chain. Car dealerships include the final three levels of the automotive value chain. As mentioned before they are co-creating marketing strategies with lead firms, they take care of distribution and sales and finally provide after sales service. This final level in the value chain ‘after sales service’ defines how dealers stay in touch with their customers after the vehicles are sold and distributed. This component includes for example repairs and services to vehicles.

2.1.2 Defining core assets

According to Aaker (1989) the assets and skills of a business, which are the basis of competition, provide the foundation for a sustainable competitive advantage (SCA) and long-term performance. An asset is something a firm possesses, such as a brand name or retail location that is superior to the competition. A skill is something that a firm does better than competitors, such as advertising or efficient manufacturing. Possessing the right assets and skills can provide the needed barriers to competitor thrusts that make the SCA persist over time. Anderson, Havila & Salmi (2001) describe business relationships with customers and suppliers as core assets of companies. In these business relationships there are always two actors involved. They cannot be created by a unilateral decision and therefore business relationships are rarely constructed, but evolve over time. According to Gupta & Lehmann (2003) customers are important intangible assets of a firm. Customers and brands are critical intangible assets that should be valued and managed. However, these intangible assets are, by definition, hard to see and even harder to fix a precise value for.

2.1.3 Defining core activities

According to Tiunov (2011) business activities can be divided in three categories. The first category includes all core activities, the essential defining activities of an organisation. If an organisation would decide to sell these activities to an external party, it would be creating a competitor or would dissolve itself. The next category of activities are non-core but critical activities. If these activities are not performed exceptionally well, they could place an organisation at a competitive disadvantage or create organisational risk. The last category of activities are non-core, non-critical activities. These activities supply no competitive advantage. Even if these activities are performed poorly, they are unlikely to seriously harm an organisation in the short term. In the Marketing Report Automotive Branche 2019 (Van Es Marketing Services, 2019) the core activities of Dutch car dealerships are defined. These core activities

are: 'sales' (new and used vehicles), 'repair and maintenance', 'damage repair', 'sales parts' and 'leasing and rental'.

2.2 Innovation

Innovation can be described as three different things: innovation is an outcome, innovation is a process and innovation is a mindset (Kahn, 2018). Innovation as an outcome describes what output is sought. This output could be: product innovation, business model innovation, supply chain innovation, organisational innovation, process innovation, and marketing innovation. Innovation as a process describes how innovation should be organised in order to make the results of the innovation flourish. This includes the overall innovation process and a product development process. The third part of innovation is innovation as a mindset. This describes how innovation initiatives within an organisation are supported by an organisational structure that helps to let the innovation flourish.

Kahn (2018) describes a way to manage innovation by linking new product considerations to an organisation's marketing strategy. By characterising the market to be served and the technology to be offered as current or new, four types of innovation strategies can be described: market penetration (current market, current technology), product development (current market, new technology), market development (new market, current technology) and diversification (new market, new technology). The main objective of the market penetration strategy is to increase market share and/or increase the product usage. Within this strategy the current customer base is pursued with no major changes to the current product technology. A market penetration strategy is characterised by cost improvements and product improvements. Within this strategy the current market is attracted to new products through lower prices, more features and/or improved features. The product development strategy aims to drive sales volume by capitalising on new product technology (Kahn, 2018). Organisations with a more diverse product line can offer more product options to connect with the current customer base. Organisations with a market development strategy aim to extend sales volumes of current product through new markets (Kahn, 2018). This market development strategy includes geographic expansions into international markets and targeting new segments. Within this strategy there is no interest in pursuing technological changes. Diversification occurs when an organisation wishes to grow by expanding its business into organisation-related and organisation-unrelated business opportunities (Kahn, 2018). The aim of this diversification strategy is to enter into new categories and introduce new products to the world.

2.2.1 Transition

When talking about the innovation concerning electric vehicles in the automotive industry, most people name this innovation a starting point of a “transition” in the automotive industry. This transition concerns the change from ICE vehicles to electric vehicles within the automotive industry. Widespread use of the word ‘transition’ suggest that it is an important concept (Kralik, Visentin & van Loon, 2006). Kralik et al. (2006) define transition as ‘the way people or organisations respond to change over time’. Transition happens when adaptation is needed to new situations or circumstances. According to the Oxford Advanced Learner’s Dictionary (Hornby et al., 2010) a transition is: ‘the process or a period of changing from one state or condition to another’. The change from ICE to an EV automotive industry in the Netherlands was initiated by the Dutch government in 2017 (VVD et al., 2017) and has set goals to only sell new emission free (electric) vehicles in 2030 and only sell emission free vehicles in 2050. Therefore, the change from an ICE to an EV automotive industry can be defined as a transition in the period 2017-2050.

2.2.2 Types of innovation

The popular work by Christensen (1997) and colleagues on disruptive technology serves as a springboard to examine key issues concerning the effect of technological change on firms and industries (Danneels, 2004). In the paper ‘What is Disruptive Innovation?’ Christensen et al. (2015) describe two types of innovation: ‘disruptive innovation and ‘sustaining innovation’. Christensen’s work on disruptive technology has been cited extensively by scholars working in diverse disciplines and topic areas, including new product development (NPD), marketing, strategy, management, technology management, and so forth (Danneels, 2004). Bower & Christensen (1995) define disruptive innovation as: ‘a process by which a product or service takes root initially in simple applications at the bottom of a market and then relentlessly moves up market, eventually displacing established competitors’. According to Christensen et al. (2015) entrants that prove disruptive begin by targeting overlooked segments, gaining a foothold by delivering more suitable functionality, frequently at a lower price. Incumbents, chasing higher profitability in more-demanding segments, tend not to respond vigorously. The second type of innovation that Christensen et al. (2015) describe is called ‘sustaining innovation. Sustaining innovation occurs when innovations make good products better in the eyes of an incumbent’s existing customers. These innovations can be incremental advances or major breakthroughs, but they all enable firms to sell more products to their most profitable customers. However, despite how widespread Christensen’s work on disruptive innovation has become in business circles (Danneels, 2004), little research has been conducted on different

change trajectories as other change trajectories have been neglected in the management literature (McGahan, 2004).

2.3 Industry structure change

In the article: 'How Industries Change' (2004), McGahan describes different change trajectories that industries follow in periods of change. Industries follow distinct change trajectories. Investments in innovation are more likely to pay off if these change trajectories are taken into account. The need to understand change in an industry might seem obvious, but such knowledge is not always easy to come by. A firm's strategy cannot succeed unless it is aligned with the industry's change trajectory. According to McGahan (2004), there are four distinct trajectories along which industries evolve. These trajectories are: 'radical', 'progressive', 'creative' and 'intermediating'. These four trajectories set boundaries on what will generate profits in a business. Many companies have incurred severe losses because they tried to innovate outside of those boundaries (McGahan, 2004).

McGahan (2004) describes two directions in by which industry structure can change. These industry structures change according to two types of threats for obsolescence to an industry's core assets and core activities. A threat to an industry's core activities means that activities that have historically generated profits in the industry are threatened with obsolescence. These activities are threatened when they become less relevant to customers and suppliers, because of some new alternative. The second threat is a threat to the industry's core assets. These are the resources, brand capital and knowledge that have historically made the organisation unique. These assets are threatened if they fail to generate value as they once did.

The first change trajectory described is the 'radical change'. This type of change occurs when an industry's core assets and core activities are both threatened with obsolescence. Radical change is closest to the concept of 'disruptive innovation' that Harvard's Christensen discusses in his book: 'The Innovator's Dilemma (1997)'. When an industry faces radical change the relevance of established capabilities and resources is diminished by some outside alternative, relationships with buyers and suppliers are under attack and companies are eventually thrown in crisis (McGahan, 2004). Radical industry change is relatively unusual. McGahan (2004) argues that it normally occurs following the mass introduction of some new technology, regulatory changes or because of changes in taste. An industry on a radical change trajectory is entirely transformed and usually takes decades for change to become clear and pay out. The end result of radical change is a completely reconfigured (usually diminished) industry. The next change trajectory occurs when neither the core assets nor the core activities are

threatened. This type of change is described as ‘progressive change’. This has been by far the most common change trajectory. Progressive change is most similar to the concept of ‘sustaining innovation’ that Christensen (1997) discusses. According to McGahan (2004) progressive change does not mean that change is minor or even that it is slow. Over time, incremental changes can lead to major changes and improvements. Companies facing progressive change do not have to put large amounts of capital at risk before learning whether an innovation creates value, their performance depends on their quick responses to feedback.

According to McGahan (2004), the other two change trajectories (creative change and intermediating change) have been neglected in management literature, possibly because of their nuances. The third change trajectory described is the ‘creative change’. This type of change occurs when core assets are under threat, but core activities are stable. ‘Intermediating change’ is the fourth described change trajectory. This type of change occurs when core activities are threatened with obsolescence while core assets remain their capacity to create value (McGahan, 2004). Intermediating change typically occurs when buyers and suppliers have new options because they have gained unprecedented access to information. Industries facing intermediating change have their core activities threatened, while the core assets retain most of their value (if used in new ways). Of the four industry change trajectories mentioned by McGahan (2004), the intermediating change trajectory is the most challenging. This because companies must simultaneously preserve their valuable assets and restructure their key relationships.

Identifying what type of evolutionary trajectory an industry is in is difficult. McGahan (2004) describes four steps for an industry to identify what type of change trajectory it is in. The first step is defining the industry. This start by identifying the companies in the industry that share common buyers and suppliers. When a group of companies intend to rely on the same supplier and appeal to the same buyers, there is additional evidence that they are direct competitors. When companies use similar technologies to create value, it is likely that they qualify as direct competitors. The second step that McGahan describes is to define the industry’s core assets and core activities. To test whether something is core McGahan describes: ‘If it were eradicated today, would profits be lower a year from now, despite efforts to work around what is missing? If the answer is yes, then it definitely qualifies’. After the core assets and activities are defined, the third step is to determine whether the core assets and activities are threatened with obsolescence. For assets and activities to be threatened with obsolescence, the threat must make core assets and activities potentially irrelevant for profitability. When you know whether a company’s core assets and activities are threatened, it is possible to identify

which of the four described change trajectories applies to the industry. The final step that McGahan describes is to evaluate the phase of the evolution trajectory. This helps an industry understand the phase that the evolution trajectory is in.

Understanding industry change can do more than help a company avoid making mistakes. The change trajectories can help companies forecast early on how change will occur in the industry and help to determine how to exploit change as it occurs. According to McGahan (2004) firms which core assets are threatened should restructure their core assets. These core assets are the durable resources, including intangibles that make a company more efficient at performing core activities. Firms which core activities are threatened should restructure their core activities. These core activities are the recurring actions that a company performs that attract and retain suppliers and buyers. Companies may diversify by entering a new business or even a new industry. Or they might sell off assets or services to former competitors.

2.3.1 Restructuring core assets

The essence of strategic management is the development, restructuring or maintenance of meaningful assets and skills (Aaker, 1989). By doing this, the assets and skills can form SCA's. Assets and skills that provide SCA's should affect performance over time. Therefore, businesses that differ with respect to performance over time, should also differ with respect to their skills and assets. Changing industry conditions can undercut strategies and the assets and skills upon which they are based (Aaker, 1989). It is therefore important to anticipate what assets and skills will be needed as industry conditions evolve. Superior performers in an industry will usually have developed, restructured, and maintained key assets and skills that have been the basis for their performance. Weaknesses in different assets and skills relevant to an industry should visibly contribute to inferior performance over time of the weak competitors.

When a firm decides to restructure its assets and skills, there is little point to investing resources into assets and skills that can be easily neutralised by competitor's strategy (Aaker, 1989). The task of protecting the environment and the needed assets and skills is therefore not easy. Different emerging trends from analyses of the customers, competitors, distribution channels, technology, and the industry environment need to be identified, monitored, and analysed. To be able to manage for the long term, the firm should focus on the assets and skills that provide the foundation for sustainable competitive advantage. Aaker (1989) describes three steps for managing assets and skills. The first step is the identification of relevant assets and skills. In the second step, different assets and skills are selected to support a strategy that will provide an advantage over competitors: be feasible, be relevant to the market, be sustainable,

and be appropriate to the future. The third and final step is to develop and implement programs and procedures to enhance, protect, develop, or restructure assets and skills.

2.3.2 Restructuring core activities

When firms are dealing with negative earnings and economic downturns, operational restructuring is often initiated as a rescue tool (Lin, Lee & Gibbs, 2008). Operational restructuring is often seen as necessary for improving efficiency, controlling costs, and coping with changing business environment. Restructuring often occurs as a response to major changes in the business climate and surroundings. Examples are technological or product innovations, changes in tax laws, deregulations, and foreign competition. Changes in market demand and customer expectations can cause a firm to find out that it is offering the wrong products or services or that it pursues the wrong business model (Lin et al., 2008). In their article ‘governance structure, corporate restructuring and performance’, Alias, Yaacob & Jaffar (2017) describe there are several reasons for undertaking restructuring exercise. Examples are: poor and declining profits and low-performing divisions (Ravenscraft & Scherer, 1991), financial distress (Wruck, 1990), to increase market share, realign corporate strategy (Markides, 1992), to reduce financial burden and generate cash proceed (Gibbs, 1993).

Activity restructuring efforts can take on a couple of forms (Lin et al., 2008). Often management takes steps to contain costs, but in other situations drastic changes such as business diversification occur. Corporate restructuring often involves refocusing or eliminating non-core businesses. Furthermore, a firm may find its needs in shifting its product or service focus to stay competitive in a market. According to McGahan (2004) some of the most exciting opportunities in industry evolution relate to diversification across industries. Restructuring is an ongoing process in which managers adjust their restructuring strategy as a firm’s operating performance evolves (Lin et al., 2008).

2.4 Conceptual model

This research aims to add to the theory by McGahan (2004) on how industries change. McGahan (2004) describes how industries follow different change trajectories in periods of change. These industries change according to threats of obsolescence to an industries core assets and core activities. In the article 'How Industries Change' (2004) McGahan describes how industries facing sustaining innovation (Christensen et al., 2015) end up in a progressive change trajectory and how industries facing disruptive innovation (Christensen et al., 2015) end up in a radical change trajectory. Within a progressive change trajectory an industries core assets and core activities are not threatened with obsolescence and therefore there will be little change in core assets and core activities. When a company is facing a radical change trajectory its core assets and core activities are threatened with obsolescence. These industries face a disruptive innovation and therefore will have to restructure its core assets and core activities.

It is expected that when a company experiences a higher extent of innovation, its core assets core activities will be more threatened with obsolescence. As a result, the company will have to restructure these assets and activities according to the innovation resulting in more industry structure change. It is expected that researching the extent of innovation can add a nuance to the theory of McGahan (2004). The expectation is that if an organisation experiences little degree of innovation, its core assets and core activities will not be threatened with obsolescence and therefore the industry structure will not change much (progressive change). As an organisation experiences a higher extent of innovation, there will be a greater need to restructure its core assets and core activities Therefore, this higher extent of innovation will lead to more changes in industry structure. This could lead to other change trajectories mentioned by McGahan (2004).

To visualise the relations between the concepts in this research a conceptual model is created. In this conceptual model the extent of innovation is shown to have an expected impact on an industries extent of structure change. This innovation can impact company assets and/or company activities in such ways that these need to be restructured to be able to deal with innovation. It is expected that car dealerships facing little extent of innovation also experience little extent of industry structure change as core assets and core activities are not threatened with obsolescence. As car dealerships experience a higher extent of innovation, their core assets and core activities will be increasingly threatened with obsolescence. As a result, these car dealerships will have to adapt to the innovation, restructuring their core assets and core activities, resulting in more industry structure change. When these threats for obsolescence are

mapped, it is possible to determine what type of innovative change trajectory the car dealerships are going through. When this change trajectory is determined, car dealerships can exploit change as it arises. This could result in the need for core asset restructuring and/or core activity restructuring (or neither).

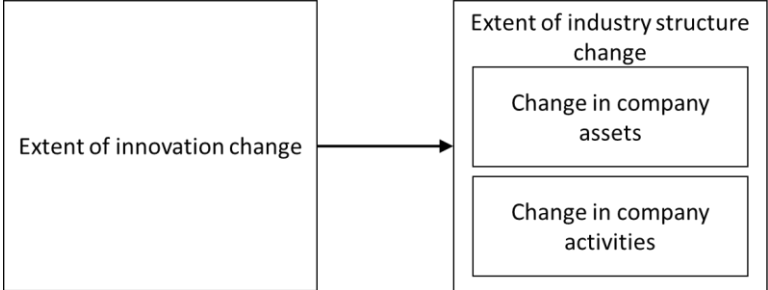


Figure 1. Conceptual model research

3. Methodology

In this chapter, the research approach of the thesis will be discussed. This chapter includes the chosen research method, the research context, the data sources to be used, operationalisation of this research and an intended data analysis procedure. Finally, this chapter will indicate how ethic issues will be addressed during the research.

3.1 Research method

Qualitative research will be conducted to get insight on how innovation impacts industry structure change. Qualitative, or interpretative research, focuses primarily on the meaning that people attribute to the situations and events (Vennix, 2019). One important characteristic of qualitative research is that phenomena are studied in their natural environment and not in isolation from it. Qualitative research is applicable when small scale research is conducted and focuses on giving meaning to, and describing of, a certain situation or case (Vennix, 2019).

Several criteria are used to assess the quality of the research. These criteria are internal validity, reliability, and external validity (Blijenbergh, 2015). These criteria are the most classic and fit within a positivist research approach and deductive research (Baarda, de Goede & Teunissen, 2009). Internal validity is the most important criterion in assessing qualitative research in an organisation (Blijenbergh, 2015). This implicates that you actually measure what you want to research. The criterion reliability is somewhat less important in qualitative research. This indicates that research findings should not be biased by chance deviations. In quantitative research there is always a smaller number of observation units, therefore it is difficult to rule out the criterion reliability. It is possible to compensate for this by making longer observations and limiting statements to the domain you have researched (Blijenbergh, 2015). A qualitative researcher will often replace reliability with verifiability of the data collection. By providing insight into the made choices during the selection of respondents and by carefully recording the data in interviews and transcripts, this process can be followed by others. External validity (or generalisability of results) refers to the criterion that your findings must be generalisable to a larger population. As this research has been conducted in a relatively short period, only a limited number of professionals in the automotive industry could be interviewed. Therefore, the external validity of this research is possibly low.

3.2 Research context

This research takes place in the Dutch automotive industry. However, as the Dutch automotive industry does not have any major car manufacturers, this research takes place in at car dealerships in the automotive industry. There are approximately 400 dealer companies active in the Dutch automotive industry (van Velzen, 2018). At these car dealerships cars are sold and serviced. According to Sturgeon et al. (2009) car dealerships include three of the seven components of the automotive industry. These components are: 'marketing', 'distribution and sales' and 'after sales service'. The component marketing defines how OEM and dealerships work together to create marketing strategies (national, regional, and local). The distribution and sales component concerns sales of vehicles and their distribution to customers. The third component 'after sales service' defines how dealers stay in touch with their customers after the vehicles are sold and distributed. This component includes for example repairs and services to vehicles. According to VNO-NCW (2017) there are approximately 40,000 people working in the Dutch automotive industry.

3.3 Data sources

Within this research the necessary data is collected by conducting interviews. These interviews are held at car dealerships that are currently experiencing innovation because of the transition from ICE to EV vehicles. Interviewing people who work in organisations or people who deal with organisations, is an important form of data collection in qualitative research (Blijenbergh, 2015). By asking people open questions about their role within the organisation and how they experience the organisation, it is possible to get this information in their own words. Interviews provide participants flexibility for explaining issues based on how well they know them (Adhabi & Anozie, 2017). This is important for the researcher as the central issue in qualitative research is to justify the occurrence of a phenomenon. According to Blijenbergh (2015) a qualitative interview provides rich and detailed information about what people do or experience within an organisation and in which way they experience this. To make effective use of this information for the research, the semi-structured interviews are recorded. In semi-structured interviews, the formulation of the questions is determined in advance (Blijenbergh, 2015). The order of the questions is sometimes fixed but can change resulting the course of the conversation. The asked questions are open-ended so that the respondents can formulate answers in their own words. An advantage of pre-structuring questions is that the researcher can steer which information will be discussed during the conversation, without pinning the respondent to a specific wording. In addition, pre-structured questions ensure that all respondents are presented the same questions. This increases the reliability of the data collection

(Blijenbergh, 2015). A disadvantage is that the pre-structuring steers the conversation in a certain direction. Unexpected matters can be discussed to some extent, but the space to explore them in depth is somewhat limited compared to an unstructured interview. This can negatively affect the validity of the research.

These interviews were held at car dealerships that are currently experiencing the transition in the automotive industry. The respondents in this research are all managers or directors at different car dealerships in the Netherlands. To show their expertise and experience in the automotive industry a column ‘years active in the automotive industry’ is added in table 1. By adding this column, it can be shown that the appropriate representatives of the automotive industry were contacted to gain relevant information for the research. Because of many years of experience in the automotive industry, all respondents have become accustomed to the current transition in this industry.

Table 1: Respondents thesis research

Respondent	Function	Years active in the automotive industry
Resp_1	Sales manager	29
Resp_2	Sales manager	15
Resp_3	Store manager	20
Resp_4	Commercial director occasions	30
Resp_5	Sales manager	24
Resp_6	Store manager	22
Resp_7	Service manager	17,5
Resp_8	Store manager	35
Resp_9	Store manager	33

3.4 Operationalisation

The two main concepts that are examined in this research are: ‘innovation’ and ‘industry structure change’. The first concept innovation is operationalised based on Kahn (2018). In the article ‘Understanding innovation’ Kahn describes three dimensions of the concept innovation. These dimensions are: ‘innovation as an outcome’, ‘innovation as a process’ and ‘innovation as a mindset’. The indicators are based on Kahn (2018) and are descriptions how the defined dimensions can be observed.

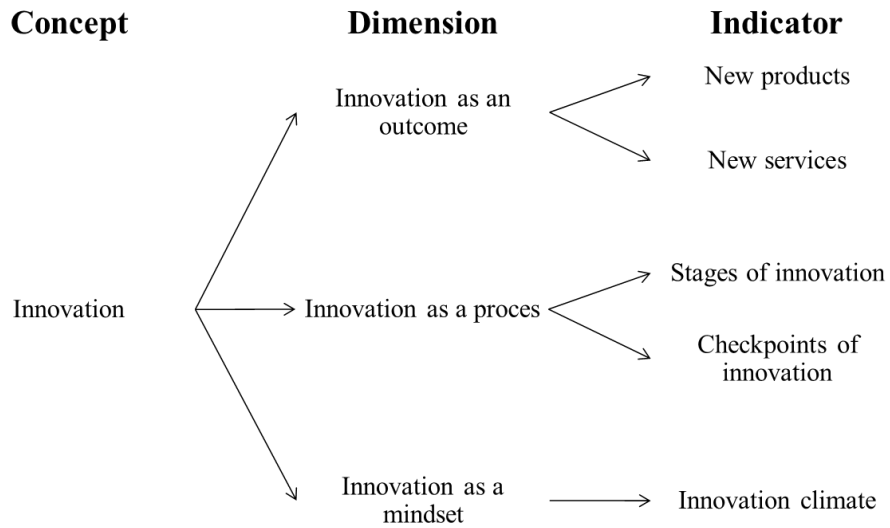


Figure 2. Operationalisation concept innovation

The second concept industry structure change is operationalised according to the article ‘How industries change’ (2004). In this article McGahan describes two dimensions in which industry structure changes when faced with threats of obsolescence. These dimensions are: ‘change in company assets’ and ‘change in company activities’. Indicators for the dimension change in company assets are based on Aaker (1989) and Anderson et al. (2001). The indicators for the dimension ‘change in company activities’ are based on examples of observable restructuring activities as named by Ravenscraft & Scherer (1991), Markides (1992), Kahn (2018) and Lin et al. (2008).

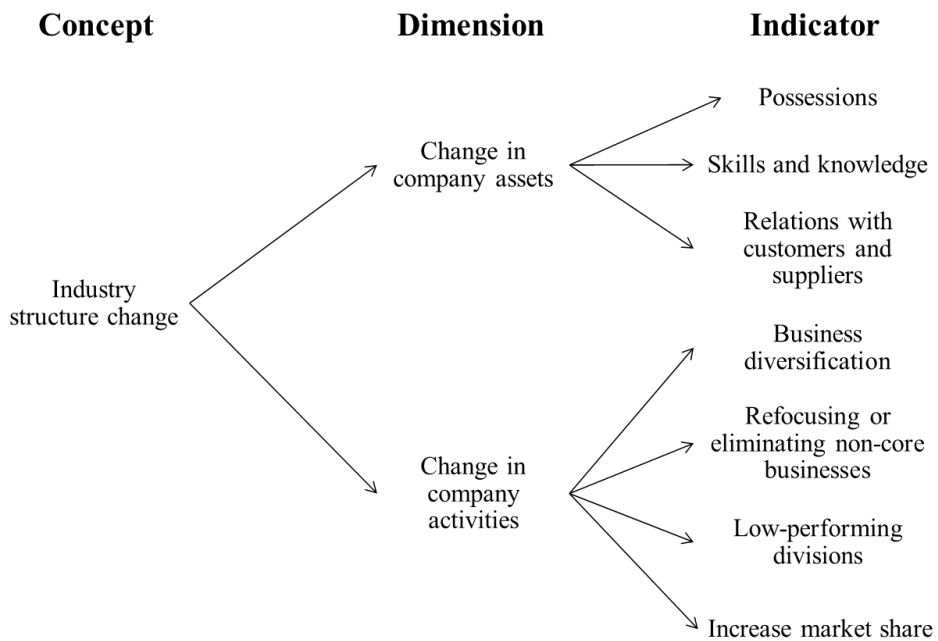


Figure 3. Operationalisation concept change

3.5 Data analysis procedure

After the interviews, a transcript of the interviews will be written. According to Blijenbergh (2015) it is preferable to make a verbatim transcript of the conversation that took place. By doing this, not only the content, but also the social interaction that took place during the interview is recorded as careful as possible. This increases the quality of the material that will be analysed and ensures that the data collection process is easily controllable for others. An alternative to a verbatim transcript is the conversation report (Blijenbergh, 2015). This is a suitable alternative to verbatim transcripts when conducting interviews about politically or strategically sensitive information. Whilst conducting the interview, extensive notes are written down. After the interviews, a transcript of the different interviews will be made. This transcript will be sent to the participants so they can check how the researcher has interpreted their answers. This gives the participating interviewees an opportunity to further explain the given information if the researcher has interpreted their answers in an incorrect matter. This ‘member check’ allows the researcher to stay close to the object of research and increases the validity of the report (Vennix, 2019).

After the interviews have been prepared for analysis through transcription, these transcriptions will get coded. This ensures that the analysis can be conducted in a narrower sense (Vennix, 2019). To be able to use deductive coding, a tree structure is created (chapter 3.4). The research has a deductive setup as a theoretical framework is based on existing literature (Blijenbergh, 2015). This theoretical framework will be used to create a tree structure to be able to use deductive coding. Coding means assigning ‘keywords’ to the obtained material (Vennix, 2019). These keywords are derived from the theoretical framework of the research. The given codes therefore provide a clear link between the collected empirical material and the theoretical framework. Coding is an iterative process: the researcher starts by reading some of the collected empirical material and making an initial attempt to interpret the material based on the theoretical framework. This iterative process consists of different steps: ‘selecting material’, ‘reading and interpreting’, ‘reflecting’, ‘selecting new material’ and so on (Vennix, 2019) The purpose of this iterative process is to identify patterns in the collected empirical material.

All the relevant quotes by respondents will be colour coded and will be visualised in a codebook. This codebook can be found in the separate Appendix Document. This codebook visualises the results from the conducted interviews. This is done by coding the quotes from transcribed interviews according to the research dimensions and indicators. Visualising the

quotes and coding these accordingly makes it possible to compare the answers given by respondents.

3.6 Research ethics

Because interviews will be conducted at competing companies, it is important to process the obtained information anonymously. This is conducted by omission of the names of the participating companies and interviewees. The anonymised will only be shared with the thesis supervisor, the second examiner and with the interview participants. Finally, a research integrity form, provided by Radboud University (called Research Integrity Form – Master thesis), will be signed by the student and the thesis supervisor. This research integrity form ensures: ‘original work or proper use of references’, ‘providing appropriate information to all involved in this study’, ‘requesting informed consent from participants’, ‘transparency in the way data is processed and represented’, ‘confidentially in the storage and use of data’.

To instruct interviewees before conducting the interview, an interview consent form is made (appendix 2). This consent form is based on the Consent form participants > 18 year (v.2 English) as provided by Radboud University (n.d.). In this form the interviewees are instructed what the research project is about and the duration of the interviews. The consent form further provides information of the confidentiality of the research data and the voluntary participation on the research. Finally, the consent form gives interviewees contact information on who to contact with questions about the research or when interviewees have any complaints regarding the research. If the interviewees agree to participate in the research, the consent form is signed.

4. Results

In this chapter the results of the conducted interviews are presented. The chapter starts by describing the automotive industry structure. After this the innovation that car dealerships experience in the automotive industry is described. Followed by the impact of this innovation on industry structure change. All concepts described in this chapter are discussed based on the dimensions that are operationalised in the theoretical background chapter. To support the results presented here, different quotes from the interviews are presented. These quotes are translated to English, as the interviews were conducted in Dutch. The original Dutch quotes can be found in appendix 3.

4.1 What is the automotive industry structure?

4.1.1 Core assets

Possessions

All the interviewed car dealerships have multiple subsidiaries. The reason for these dealerships to have multiple subsidiaries is to be able to sell and service different car brands in certain areas, for example East Netherlands or certain provinces, for example Gelderland.

“██████ in general has 14 car dealerships and two Vakgarages in ██████ and ██████ and 14 damage repair shops.” (Resp_1)

Next to multiple subsidiaries, all the interviewed car dealerships have many employees. Generally, these car dealerships have hundreds of employees. These employees are spread over several locations and work in different business divisions.

“There are about 15 employees working at this location. And group-wide about 700 people spread over 32 locations.” (Resp_6)

The respondents indicate that there are several older technicians working at the various subsidiaries. The respondents noticed that these mechanics find it difficult to work on modern cars. The respondents also wondered whether these mechanics would be open for gaining new knowledge in order to be able to work with new vehicles in the future.

“But the question is to what extent is the older guard open to adopting this knowledge? There is still quite a challenge for the future. We have a fairly young club, but there are also 3 older mechanics who: 'have grown up with grease'. In that sense I find it challenging and exciting. (Resp_7)

Several respondents indicated that there is currently a personnel problem in the Netherlands. This makes it very difficult for car dealerships to find suitable new employees. To recruit new employees, car dealerships are currently performing additional activities aimed at attracting potential employees.

“We currently have a personnel problem in the Netherlands. In fact, we forgot to think about this five years ago. So we are now trying to catch up. How can we make [REDACTED] an interesting employer for people who are about to graduate?” (Resp_9)

Skills and knowledge

Car dealerships are specialised in selling and servicing cars from a specific brand (or brands). These dealerships have specialised skills and knowledge concerning these brands because of brand-specific trainings. This provides these dealerships with an advantage over regular car companies.

“That is where the specialism lies, there are people who have completed the right training and who know what they are talking about.” (Resp_6)

Relations with customers and suppliers

As mentioned before (chapter 3.2), car dealerships are responsible for the main part of the Dutch automotive industry value chain. However, looking at the value chain of the global the automotive industry, car dealerships are only a small part of the chain. They are dependent on the products they receive from their suppliers. This was also mentioned by Respondent 9 who mentioned that car dealerships are franchisee of a lead firm (car manufacturer).

“You remain a part of the distribution chain. We are franchisee of a factory. As a result, you remain dependent on the products that are presented to you.” (Resp_9)

The suppliers of the car dealerships are lead firms in the automotive industry that produce vehicles (OEM assembly) and parts (OEM parts). These lead firms produce brand specific parts that can not be bought at wholesalers. Because car dealerships are connected to a specific car brand (or brands) these car dealerships are the only companies that can buy and sell these brand specific parts. A regular car company (non-brand specific) can only buy parts from the car dealerships or from wholesalers.

“As a car dealership you buy many parts from the importer. You can often not avoid that because these are brand specific parts. Tires and brakes are things that you can buy universally, but you will have to get most parts through your importer. Because of this the importer does have a strong dominant position in this process.” (Resp_6)

Some parts however are non-brand specific. Examples are tires, brakes, and oil. These parts can be bought from lead firms, however for these parts car dealerships can divert to wholesalers when lead firms cope with delivery problems.

“We are dealing with the importer, the importer is currently also having some problems with the delivery of electronics due to Corona. But usually it works just fine.” (Resp_7)

“With certain parts we can still divert to wholesalers.” (Resp_7)

The customers of the car dealerships are private individuals and companies such as leasing companies. To be able to guarantee a good customer relationship, the car dealerships work with CRM systems. The purpose of this is to bind customers to the company as best as possible by providing the service desired by the customer.

“We have a nice CRM system and we certainly think about it (customer relations). The customer orientates on the internet and knows almost everything before purchasing a vehicle in the showroom. After this purchase, the customer receives a thank you letter and a video from the management to thank them.” (Resp_4)

4.1.2 Core activities

Core businesses

The interviewed car dealerships are active in different business within the automotive industry. The two core business activities of the car dealerships are traditionally sales and service of vehicles. Within these business activities new and used cars are sold and service is provided to be able to maintain and repair these vehicles.

“Maintenance and sales are the main components of [REDACTED]. In addition, they also have the group [REDACTED], they are active in the damage repair world and they are also growing considerably. But they are also very active in car rental and these activities are only increasing.” (Resp_7)

However, as mentioned before (chapter 2.1.1), the car dealerships are strongly dependent on lead firms that provide them with products to sell. To be less dependent on these lead firms, car dealerships become active in other sectors of the automotive industry. Examples of this are damage repair divisions and lease and rental division.

“Furthermore, the company is looking at multiple legs to be less dependent on those brands. On the one hand selling cars and everything that goes with it, on the other hand repairing cars with damage. Those two most important legs are therefore the car sales & service division and the damage repair division. The third leg, which we are currently very busy with, is the lease and rental branch.” (Resp_9)

Some respondents mentioned that they are always developing new business activities and that they are providing mobility in its widest sense. Not only selling and servicing cars but also providing customers with additional types of mobility.

“Everything that has to do with mobility, that is actually what it is increasingly about. Mobility in a wider sense, so selling cars is of course the most well-known division. But of course also think of repair, rental, leasing, and damage repair divisions. We are increasingly covering mobility, for example, offering bicycles. Mobility in the widest sense of the word.” (Resp_2)

4.2 What is innovation change (transition)?

The outcome of innovation

The main outcome of the innovation ‘transition to an electric vehicle automotive industry’ is of course the electric vehicle itself. This is a product innovation as the current product (ICE vehicle) is innovated to meet changing governmental demands. All respondents indicate that current electric vehicles are significantly more expensive compared to ICE vehicles. Due to this, these electric vehicles are not available for all customers.

“This is also due to the fact that electric cars are currently significantly more expensive than cars with internal combustion engines.” (Resp_9)

The respondents indicate that a higher purchase price compared to ICE vehicles is partly accounted for because electric vehicles offer better performance in several areas. An important advantage is that an electric vehicle has no carbon dioxide emissions. As a result, these vehicles are exempt from road taxes and purchase tax (BPM) in the Netherlands. Another important

advantage of the electric vehicle is that the fuel (electricity) used per driven kilometre is significantly cheaper compared to fossil fuels.

“Electric vehicles are certainly not increase in price and the fuel component for an average car quickly saves 150 to 200 euros that a company can save by driving an electric vehicle. Therefore, the electric vehicle may well be a bit more expensive, you will still have a difference.” (Resp_8)

There were two main responses to the question which outcome the innovation electric vehicles brought for the respondents. Most respondents have been working with electric vehicles for several years and started working with these vehicles in the period 2011-2014. At this moment these companies have different range of models of electric vehicles for sale and service. These companies have therefore experienced a high extent of innovation (HEI).

“As of approximately 2011, we already have a lot of experience with both [REDACTED] and [REDACTED]. These are two pioneers in the field of electric vehicles. Perhaps they have stood still a bit more in recent years. They have been overtaken by competition a bit more, but it is part of the range we have had for years.” (Resp_6)

However, some respondents have only been working with electric vehicles since 2020 and have only one electric vehicle in their product range. Therefore, these respondents experience little innovation in the automotive industry (LEI). An example of this is visible in a quote from Respondent 3:

“Our first EV car that we have is only available from 2020. Two years now. For maintenance the first people are now trickling in. There are actually always customers who come with questions concerning maintenance for EV’s. But we have only just come into contact with electric cars, that is not a very long period.” (Resp_3)

The innovation process

In the Dutch Coalition Agreement of 2017, goals were set to reduce carbon dioxide emission by transitioning the automotive industry from ICE vehicles to emission free (electric) vehicles. This coalition agreement brought two targets. The first target is to only sell new emission free (electric) vehicles in 2030. The second target is to only sell emission free (electric) vehicles in 2050. Therefore, the transition to an EV automotive industry has an end date of the 1st of January 2050.

As mentioned before there are two types of car dealerships that are experiencing the transition from ICE vehicles to electric vehicles. At the first type of car dealerships the innovation process for started in the period 2011-2014. These HEI dealerships are experiencing the product innovation from ICE vehicles to electric vehicles for a longer period. Because they have more experience with electric vehicles, these car dealerships are further in the transition to an EV automotive industry. This can be seen as these dealerships are selling and servicing different electric vehicles. Respondent 1 gave a good example to show how far the company he works for has proceeded in the innovation process.

“We got our first electric vehicle, the ██████ in 2011. So, we have many years of experience with electric vehicles. Thanks to this experience, new models have been added over the years. For example, the new ██████ was introduced in 2018 and a 62-kWh version was added in 2019. Because ██████ already has a lot of knowledge of electric vehicles, this is also spread over all other models. For example, soon we will get the ██████, the ██████ and the ██████. At the end of the year, I expect that all models will be electrified.” (Resp_1)

The second type of car dealerships have only a few years to no experience with electric vehicles (LEI). These car dealerships only have limited electric models for sale and have no to little experience with servicing these vehicles. These car dealerships have not proceeded much in the innovation process.

The respondents indicate that the innovation will only come to fruition when the electric vehicle is made financially attractive by the government, for example through subsidies on electric vehicles, or extra taxes on ICE vehicles. This because most respondents indicate that a higher price compared to ICE vehicles is the main factor that hinders the innovation process.

“Everything is technically possible, but everything comes at a price. The price of EV’s is what holds the transition back. You see very clearly that if the government stops subsidising, a dip in EV sales occurs. And when the new subsidy pots open again, more electric cars are suddenly sold. This is also due to the fact that electric cars are currently significantly more expensive than cars with internal combustion engines. The ones that turn the knobs determine how fast the transition happens. When the knobs are opened completely, we will have a fully electric automotive industry within two years.” (Resp_9)

The innovation mindset

The innovation mindset is the third part of innovation (Kahn, 2018). This innovation mindset has been examined in the interviews by asking questions whether respondents have experienced many innovations in the automotive industry, and whether they see the automotive industry as innovative. Finally, the respondents were questioned whether car dealerships have targets for electric vehicles, additional to the targets set by the government. All the respondents see the automotive industry as an innovative industry, while also stating that the car itself is a very traditional product. The respondents mentioned that because of their experience in the automotive industry, they have experienced many innovations in this industry. The interviews show that a large part of these innovations arise from technical developments or from new governmental legislations and regulations. A quote that summarises the innovation mindset in the automotive industry was stated by Respondent 5:

“Yes, extremely flexible and innovative. Which I had not expected since the car (and industry) is a traditional thing. It can be clearly seen that the automotive industry is flexible in responding to agreements made in the field of emissions.” (Resp_5)

In the conducted interviews the respondents were asked the question whether their companies have targets regarding electric vehicles. The answers given were quite similar. The respondents stated that their companies do not have additional targets for electric vehicles. However, at most car dealerships the salesmen are rewarded with bonuses when selling more electric vehicles. The only targets that the companies pursue are the targets set by the government. In the Netherlands these targets are defined in the Coalition Agreement of 2017: car dealerships are only allowed to sell new emission-free cars from 2030 and only emission-free cars (new and used) from 2050 (VVD et al., 2017). In the following quote, Respondent 7 described the targets of the company he works for concerning electric vehicles:

“Sales wise I do not know, I do not think so. We do not have a target for electric cars in the workshop. The company follows the government's objectives that the newly sold cars should be emission-free by 2030. We are working hard to be able to realise that goal.” (Resp_7)

4.3 How does innovation change impact the automotive industry structure?

4.3.1 Changes in company core assets

Possessions

The interviews conducted show that various possessions of dealerships in the Dutch automotive industry are not threatened with obsolescence. First the possession of 'staff' was discussed. Dealerships that already frequently work with electric vehicles are experiencing a decrease in workshop activity. This could mean that there are too many technicians for the available work. However, the interviewees indicate that they are currently doing everything they can to continue to fill the workshop. As a result, the interviewees believe that they do not have too many staff members. This was also confirmed by Respondent 5.

“Due to the decrease of work in the workshop, we do not yet see that we have too many employees. This is also because we do everything we can to retain the customer and thereby retain work.” (Resp_5)

In addition to filling the workshop, the recruitment of mechanics ensures that the 'staff' is not threatened with obsolescence. At the moment there are only a limited number of new mechanics, which means that the number of mechanics that the dealerships have is up to par with the work available in the workshop.

“It is in itself a good thing if you are talking about the recruitment of new mechanics. Since this is relatively limited. The number of technicians you need is now up to standard with the work offer that is available.” (Resp_1)

In addition to the asset of 'personnel', the interviewees were also asked whether the asset 'locations' is threatened with obsolescence by the entry of electric vehicles into the Dutch automotive industry. Most respondents gave similar answers, indicating that due to the introduction of the electric vehicles, customers will probably visit the dealership less often. As a result, the respondents find it important that customers know the locations of dealerships when they require their services and products. Because of this, the respondents indicate that the locations of the dealerships are not threatened with obsolescence.

“Locations, I don't think these are threatened. It is important that people know where to find you when something is wrong with the car.” (Resp_7)

When looking at the tools used in the workshop, the respondents do not expect that they will be threatened with obsolescence. Since the ICE vehicles have to be maintained for the time being, these tools will remain important for the workshops. The respondents indicate that this existing amount of tools must be supplemented with tools that are specifically aimed at maintaining electric vehicles.

“The workshop must be grounded, special suits, you name it. Eventually you will also need special tools, for example to be able to remove the batteries from the vehicle.”
(Resp_7)

Skills and knowledge

All respondents answered that existing skills and knowledge in the automotive industry are not threatened with obsolescence. The respondents indicate that the ICE vehicle will be sold until 2050 and that these vehicles still need to be maintained in the period after that. Existing knowledge and skills of ICE vehicles will therefore still be useful in the next decades, and even after 2050.

“Current knowledge will not be lost. But above all, extra knowledge should be acquired to be able to work with electric vehicles in a correct matter. And if you don't know your products, you won't get anywhere. That is why you also have to maintain and develop knowledge of ICE vehicles. That's so important, by doing this you can differentiate yourself from competitors.” (Resp_3)

During the interviews, the respondents were also asked what additional knowledge is necessary to be able to work correctly with electric vehicles. The respondents indicated that most of the new knowledge must be acquired in the workshop. This because this department is most influenced by the entry of electric vehicles into the Dutch car industry.

“Well look, working on an electric vehicle is a specialism. That includes certifications, and that includes training. So I don't see it as a threat to the existing knowledge, but you will have to acquire other knowledge to be able to work with electric vehicles in the right way in the workshop.” (Resp_6)

In addition to extra knowledge needed in the workshop, the respondents indicate that the other departments must acquire additional knowledge in order to be able to work with electric vehicles. For example, the sales department must be able to advise customers on electric vehicles and new topics that electric vehicles bring to the automotive industry.

“The necessary knowledge is indeed mainly needed in the workshop, yes. But the sales division also has to keep up with what is happening, because a customer also comes up with questions about new topics such as vehicle to the grid and vehicle to home. Both sales and after-sales must be aware of this.” (Resp_1)

Relations with customers and suppliers

In the interviews the respondents were asked whether relations with customers and suppliers have changed according to the transition to an EV automotive industry. All the given answers were again quite similar. When looking at customers, the respondents don't think that relations will fundamentally change. All the respondents mentioned that the customers come up with new questions regarding electric vehicles, but that this does not change relations with customers. A good explanation of this was described by Respondent 8:

“Basically, the game remains the same, but you have to involve the customer more in the process. The customer also becomes somewhat dependent on you because the ICE car has actually been the same for 100 years. The electric car is a completely different product, which customers also have to get used to again. So I think it will be more fun for us.” (Resp_8)

When asking the respondents whether relations with suppliers are changing according to the transition to an EV automotive industry, again the respondents did answer quite similar. The interviews were conducted at car dealerships, these car dealerships are attached to OEM's (Original Equipment Manufacturers), for example Renault, BMW, and Mazda. Therefore, the dealerships are obligated to buy parts from these suppliers (for EV and ICE vehicles). Besides these suppliers, most car dealerships acquire universal parts from other suppliers such as for example Brezan.

“Of course we have different suppliers for parts. Here we see that we are going to buy other things from them. For example, we buy less oil, but for example all cars need windshield washer fluid and tires, electric vehicles or not. So you're not going to divest such a Brezan-esque company. Relationships with suppliers therefore remain the same, but there is a difference in the products purchased from these suppliers.” (Resp_1)

The respondents emphasised the importance of building relationships with suppliers. Most of the time these relationships are built over many years and therefore the dealerships want to preserve these valuable relationships. This was also mentioned by Respondent 2:

“Because of the electric car other products have to be purchased. I don't think that supplier relationships will come under pressure, but that you should use your suppliers in a different way. You have to be careful with your relationships and always stay in touch with them, that is very important.” (Resp_2)

4.3.2 Changes in company core activities

Business diversification

As a company's activities are threatened with obsolescence, activity restructuring efforts can take place in different forms (Lin et al., 2008). One example of this is business diversification. Some of the respondents answered that the companies they work for pursue business diversification strategies. Some of these diversifications are related to the current ICE automotive industry. Examples of these diversification initiatives are starting the 'Vakgarage concept' and expanding renting activities, by diversification to truck rental. This was mentioned by Respondent 4.

“We also have lease branch [REDACTED] leasing company, in addition to a large car rental branch where, I estimate, about 800 to 900 cars are currently driving around. Besides that, quite recently, a commercial vehicle truck rental company was acquired in the [REDACTED]. And a large division within our group is also the car damage branch of [REDACTED], which now also has 15/16 subsidiaries. That has been growing really fast lately. A large area, say from Arnhem/Nijmegen to Groningen.” (Resp_4)

Some other diversification efforts are related to opportunities of the EV automotive industry. These diversification efforts are focused at providing extra services for customers owning an electric vehicle. Examples of this are diversification into the industry of EV charging stations and opening special Battery Repair Centra. These diversification efforts were also mentioned by Respondent 1 and Respondent 6.

“Yes we have those too. We now have a company that we work with that offers charging solutions (charging stations) for electric cars. So that the customer can charge the car at the dealer and we can add this as a service, for example when performing maintenance to the car. That is quite an expansion and a company that we are now working with, which is great because we can also advise customers who want a charging box about this.” (Resp_1)

“We are in [REDACTED] as [REDACTED] we have opened a Battery Repair Centre there. There, batteries are repaired and battery cells are replaced. That is also an opportunity we have, in which we can also grow. There are opportunities to increase turnover, because there are currently 3 Battery Repair Centra in the Netherlands, including [REDACTED] in [REDACTED].” (Resp_6)

A few respondents also mentioned diversification strategies unrelated to the automotive industry. These unrelated business diversifications are focused on providing customers additional types of mobility.

“You have to look for other opportunities, otherwise you will lose your right to exist. We are now fully engaged in expanding damage repair, rental, and leasing activities. To make sure we can maintain volume. And we will have to come up with other concepts to continue to bind customers. For example, selling and maintaining bicycles, in addition to cars. I think we will also get mobility in the form of a subscription. Not only Ben and Vodafone, but also [REDACTED]. That development started in the supermarkets. The grocer disappeared, the butcher disappeared, and it all came together in one shell. And you can now see that the car industry is also looking for that. You can already see this development at Pon (automotive holding), who have bought Gazelle (a bicycle manufacturer). [REDACTED] as a company has to continue in the Netherlands.” (Resp_9)

Refocusing or eliminating non-core businesses

The interviews show that the HEI car dealerships are shifting their focus away from non-core businesses. Due to a decrease in turnover in the workshop, their focus is often shifted to other divisions, such as the rental, leasing, or damage repair divisions, because these divisions are more profitable.

“Look, it is true that in the past the main return was mainly earned in the workshop, that is no longer the case. As a result, you see a shift in focus from the workshop to sales and rental. The sales division make a very good contribution (must make a good contribution) to keep the car dealership profitable. We also see this in the increase in rental: short lease, where you for example can rent a car for six months, we are currently pursuing this opportunity.” (Resp_1)

LEI car dealerships do not yet see a need to shift their focus from a particular division, as they have not yet experienced a decrease in turnover. This was also mentioned by Respondent 2.

“Because the turnover of the workshop is not yet influenced by the entry of electric cars, we do not experience a shift of focus in our business activities. The workshop remains an important part of our business model.” (Resp_2)

When looking at the eliminating of non-core businesses, both HEI and LEI car dealerships answered quite similarly. They all acknowledge that the EV negatively affects (or will affect) the turnover in the workshop. Furthermore, the respondents mentioned that cars will always need maintenance and repair. Therefore, they are certain that the workshop division will not be eliminated, because of the entry of the EV into the Dutch automotive industry.

“I don't see us eliminating the workshop division yet. I am looking at [REDACTED] itself now, but we will always continue to carry out repairs and maintenance. Service intervals will always exist because you also have to calibrate an electric vehicle. Only changing oil, for example, that will no longer take place.” (Resp_5)

Low-performing divisions

A possible effect of change in company activities is that some business divisions are low-performing (Ravenscraft & Scherer, 1991). All the car dealerships where interviews took place, consist of different business divisions. For example: sales, maintenance, rent, damage repair and leasing. Most respondents state that the workshop of the car dealerships is threatened by obsolescence because of the electric vehicle. All respondents state that the electric vehicle requires less maintenance compared to ICE vehicles. Because electric vehicles require less maintenance, most car dealerships experience turnover losses in the workshops. As the number of electric vehicles keeps increasing, the turnover in the workshops keeps declining. The respondents stated that this decline in workshop turnover was due to the fact that electric cars for instance do not need oil. Currently this is an important margin maker for car dealerships.

“In particular the workshop turnover. At this moment there are different margin makers such as oil, for example. If you don't have to change oil anymore, you will lose a very important margin maker. Look, a litre of oil costs [REDACTED] in bulk and I sell it for [REDACTED], so that is a margin maker and you lose it completely with the electric car. Compensation must be sought for this in the form of selling by-products or other services that you are

going to add. So the workshop will be most affected by this transition in the coming years.” (Resp_9)

Not all interviewees mentioned that their company experienced low-performing divisions. The LEI car dealerships do not experience losses in workshop turnover.

“Our workshop has not yet been affected by the decrease in oil turnover, because we only have one electric model, the [REDACTED]. That may soon change, but for the time being only the [REDACTED] is in our offering and we hardly notice any consequences for the workshop.” (Resp_3)

Increase market share

Just like low-performing divisions, an increase in market share is a possible effect of change in company activities (Markides, 1992). Respondents working at car dealerships that have been working with electric vehicles for several years, all answered that the companies they work for increase market share in divisions of the automotive industry. These increases in market share mainly take place at rental, leasing, and damage repair divisions. As these companies lose turnover because of the electric vehicles, they start expanding profitable business divisions to achieve economies of scale. Most respondents stated that the car dealerships achieve this increase in market share by mergers and acquisitions of smaller companies.

“In particular, you see the fleets of the rental companies growing. They need more cars to meet the demand. [REDACTED] has acquired a rental company [REDACTED]. As a result, they now have a fleet of approximately 800 cars. There is enormous growth there. [REDACTED] also develops in this area to keep up with demand and seeks development and growth in this area.” (Resp_6)

“We are now fully engaged in extending damage repair divisions and expanding rental and leasing activities. This to ensure that we can maintain volume and achieve economies of scale.” (Resp_9)

LEI car dealerships do not experience increases in market share. As these dealerships do not experience turnover losses because of electric vehicles, they do not experience a need to increase market share in other divisions.

5. Conclusion

This research focused on the influence of innovation on industry structure change. This has been investigated in the Dutch automotive industry as this industry is currently experiencing innovation in the transition from ICE vehicles to electric vehicles. It was hypothesised that innovation would play a role in the industry structure change and that this might change due to changes in assets and activities within this industry. It was expected that car dealerships facing little extent of innovation also experience little extent of structure change as core assets and core activities are not threatened with obsolescence. Car dealerships facing a higher extent of innovation were expected to also experience a higher extent of structure change as core assets and core activities are threatened with obsolescence. To investigate this, the following research question was formulated:

How do innovation changes in core-assets and core-activities impact the structure of the automotive industry?

Car dealerships are responsible for the main part of the Dutch automotive industry value chain. However, looking at the value chain of the global automotive industry, car dealerships are only a small part of the chain. Car dealerships depend on the products of their suppliers, this makes car dealerships franchisers of lead firms (car manufacturer). Suppliers of the car dealerships are lead firms in the automotive industry that produce vehicles (OEM assembly) and parts (OEM parts). These lead firms produce brand specific parts that cannot be bought at wholesalers. Because car dealerships are connected to a specific car brand (or brands) these car dealerships are the only companies that can buy and sell these brand specific parts. A regular car company (non-brand specific) can only buy parts from the car dealerships or from wholesalers. All the interviewed car dealerships have multiple subsidiaries, to be able to sell and service different car brands in certain areas. Car dealerships are specialised in selling and servicing cars from a specific brand (or brands). These dealerships have specialised skills and knowledge concerning these brands because of brand-specific trainings. This provides these dealerships with a competitive advantage over regular car companies.

The innovation that car dealerships are facing is a sustaining innovation, due to a product development. ICE Vehicles are replaced by electric vehicles, improved with new technologies. Because of these new technologies the electric vehicle is more expensive compared to an ICE vehicle. The electric vehicle offers better performance in different areas in comparison to ICE vehicles, for example no carbon dioxide emission.

When looking at the extent of innovation, two groups can be defined. The first group consists of car dealerships that already have experienced a high extent of innovation (HEI) and therefore have a range of electric models for sale and service. The second group consists of car dealerships that have experienced only little extent of innovation (LEI) and therefore have only limited electric models for sale and service. The innovation process started in 2016 with the UN Climate Agreement in Paris. The Dutch automotive industry was impacted with this innovation since the Dutch coalition agreement of 2017. Respondents indicate that the pace of this innovation process is determined by governmental subsidies for electric vehicles. The automotive industry has an innovative mindset. All the respondents identify the automotive industry as an innovative industry and therefore it is experiencing many innovation changes. Many of these innovations are based on technological development or governmental regulations. The innovative mindset however is not translated in additional goals concerning electric vehicles. The respondents indicate that the goals in the coalition agreement are severe enough.

Both type of car dealerships (high and little extent of innovation) experience no threat for obsolescence in company assets. Possessions are not threatened because the transition to an electric vehicle automotive industry does not lead to: less staff members needed and less locations needed. Also current skills and knowledge are not threatened with obsolescence. As ICE vehicles are still around in 2050, these vehicles also need servicing, therefore skills and knowledge how to work with these vehicles will remain relevant. Respondents state that existing skills and knowledge are not threatened, but need to be enhanced with skills and knowledge concerning electric vehicles. All the respondents mentioned that current relations with customers and suppliers are not threatened with obsolescence when transitioning to an EV automotive industry. The respondents mention that customers must be included in the innovation process, so they can understand why the transition is happening. Also relations with suppliers are not threatened with obsolescence. Car dealerships are attached to OEM suppliers and are obligated to buy parts from these suppliers, whether this is for EV or ICE vehicles. The respondents mentioned that most relations with suppliers are built over many years and therefore the respondents are keen to preserve these valuable relationships.

HEI Car dealerships do experience changes in company activities because of the transition to an EV automotive industry. Electric vehicles do not require as much maintenance compared to ICE vehicles. Therefore, these dealerships experience severe turnover losses in the workshop division. LEI Car dealerships on the other hand do not experience changes in company activities. Because they do not service many electric vehicles, they do not experience turnover losses in the workshop division. Dealerships that experience these turnover losses try different ways to compromise for these turnover losses. One possible way to compromise is business diversification. These diversifications can be ICE vehicle related (for example opening a truck-rent division), EV related (by for example selling vehicle charging solutions or not related to the automotive-industry. An example of a non-related diversification is selling and servicing electric bicycles. These non-automotive industry-related diversification initiatives are focussed on offering customers extra ways of mobility. As HEI car dealerships experience turnover losses in the workshop, these dealerships start shifting their focus: from the workshop to another division (for example sales, rent or leasing). However, these dealerships do not start with eliminating non-core businesses. Respondents indicate that the workshop will remain a relevant division as ICE vehicles will need to be services for many years to come. Therefore, the workshops at car dealerships will remain, probably on a smaller scale. Diversification is one way in which car dealerships try to compromise for the workshop turnover losses. Another way is by creating economies of scale in other business divisions. By growing and increasing market share, these dealerships create economies of scale. These growth efforts can be seen in different mergers and acquisitions in the automotive industry in the last years. Many respondents indicated mergers and acquisitions in rental, leasing, and damage repair divisions.

The results of this research show that innovation has a serious impact on the industry structure change. The more innovation a car dealership experiences (further in the transition process), the more industry structure change this dealership experiences. This confirms the hypotheses as stated in chapter 2.4. The transition to an electric vehicle automotive industry has an important impact on the structure of the automotive industry. LEI Car dealerships, have little experience with electric vehicles and therefore do not experience many changes in the automotive industry structure. As both their core assets and core activities are currently not threatened with obsolescence, they feel no need to change these according to the transition to an electric vehicle automotive industry. However, HEI car dealerships, already have more experience with electric vehicles. Because of this these dealerships experience changes in the structure of the automotive industry. As these car dealerships' core activities (the workshop)

are threatened with obsolescence, because of the transition to an EV automotive industry, these dealerships experience many restructuring activities to remain relevant to their customers. The workshops lose relevance for their customers and therefore the focus of dealerships shifts to other (more profitable) divisions. As a result of this these car dealerships try to create economies of scale in current business divisions or diversify into other business segments.

6. Discussion

This final chapter starts by interpreting the results of the research. After the results are interpreted, the contribution to theory will be discussed. The practical implications of this research will be presented next. This chapter ends with some limitation of this research and some suggestions for future research.

6.1 Interpretation of the results

For this research interviews are conducted to test whether the extent of innovation has an impact on the extent of change within an industry. This was tested in the automotive industry as it is currently experiencing innovation because of the transition from an ICE automotive industry to an EV automotive industry.

Although the electric vehicle may seem a disruptive innovation, as Emeritus prof. dr. van Rossem thought (van Rossem, 2021), it is a sustaining innovation. A sustaining innovation targets high-end customers with better performance than previously available, whether this performance is an incremental improvement or a break (Christensen & Raynor, 2013). The electric vehicle offers better performance at a higher price compared to ICE vehicles (Harvard Business Review, 2015). Therefore, the Dutch automotive industry is facing a sustaining innovation and should therefore be on a progressive change trajectory.

The result of the research however shows that car dealerships in the automotive industry that experience little extent of innovation (LEI) also experience little extent of industry structure change and car dealerships that experience a high extent of innovation (HEI) experience a high extent of structure change. These HEI car dealerships' core activities are threatened with obsolescence and therefore require restructuring to remain relevant to their customers. However, the core assets of these HEI car dealerships are not impacted by the innovation and are therefore not threatened with obsolescence. This means that instead of being on a progressive change trajectory these HEI car dealerships are on an intermediating change trajectory. At the LEI car dealerships neither the core assets nor core activities are threatened with obsolescence because of the innovation. Therefore, these car dealerships are on a progressive change trajectory. This means that not only the type of innovation impacts industry structure change (as mentioned by McGahan, 2004), but also the extent of innovation.

6.2 Contribution to theory

This research adds to the theory by McGahan (2004) on how industries change. McGahan (2004) describes how industries follow different change trajectories in periods of change. These industries change according to threats for obsolescence to an industries core assets and core activities. The article 'How Industries Change' describes how industries facing sustaining innovation end up in a progressive change trajectory, because core assets and core activities are not threatened with obsolescence. This was confirmed in this study. As mentioned before the transition in the automotive industry is a sustaining innovation. Car dealerships facing little extent of innovation (LEI) therefore experience no threats for obsolescence in core assets and activities and are therefore on a progressive change trajectory. However, car dealerships facing a high extent of innovation (HEI) experience a threat for obsolescence in core activities. Therefore, these car dealerships are on an intermediating change trajectory. This proves not only the type of innovation impacts industry structure, but that the extent of innovation also impacts the industry structure change.

This difference in industry structure change can be explained by a difference in adaptability. This adds to the article of Aggeri et al. (2009) by adding that not only learning (and adaptability) is a crucial capability to be able to deal with disruptive innovation, but also to be able to deal with sustaining innovation. According to Smith & Webster (2018) adaptation is an important driver of innovation. Pulakos, Arad, Donovan & Plamondon (2000) define adaptability as one's propensity to solve problems creatively and deal with situations through innovative means. For someone to innovate, he must first be able to adapt (Smith & Webster, 2018) Adaptation requires motivated action, which means not only the ability to adapt, but also the willingness to take the risk. Car dealerships with a better adaptability started the transition to electric vehicles earlier (even before this was legally stipulated). As a result, these HEI car dealerships have experienced more of the transition, have more knowledge and experience with electric vehicles and have adapted their core activities accordingly. These HEI car dealerships -because of a better adaptability to innovation- are ten years ahead of LEI car dealerships in the transition to an EV automotive industry. Reeves & Deimler (2011) describe how sustainable competitive advantage no longer arises exclusively from position, scale, and first-order capabilities in producing or delivering an offering as these are essentially static. More and more managers are finding that sustainable competitive advantage stems from 'second-order' organisational capabilities that foster rapid adaptation. Companies must be really good at learning how to do new things instead of being really good at going some particular thing.

Companies that eventually thrive are quick to react and act on signals of change. These companies have worked out how to experiment rapidly, frequently, and economically. Because of this these companies do not only experiment with products and services but also with processes, strategies, and business models. For a company to adapt, it must receive signals of change from the external environment, decode these signals, and quickly act to refine its business model and even reshape the landscape of its industry.

6.3 Practical implications

In the article 'How Industries Change', McGahan (2004) describes that a firm's strategy cannot succeed unless it is aligned with the industry's change trajectory. Investments in innovation are more likely to pay off if these change trajectories are taken into account. Many companies have incurred severe losses because they tried to innovate outside of those boundaries (McGahan, 2004). This research has established that it is not only the type of innovation that determines which change trajectory a company ends up in, but also the extent of innovation that a company experiences. When determining a strategy, it is important for companies to consider not only the type of innovation, but also the extent of innovation that the company will experience, and the extent to which the company can adapt to this innovation. When this is considered, it is possible for these companies to align their strategy with the industry change process, so that innovation can be better imprinted in this strategy and therefore has a better chance of success.

As the HEI car dealerships have experienced more innovation compared to LEI car dealerships, they have restructured their core activities according to the transition to an EV automotive industry. Because of their higher level of adaptability competences, the HEI car dealerships started the transition years before the LEI car dealerships. Therefore, managers at LEI car dealerships can learn from managers of these HEI car dealerships. They can learn how to deal with the transition to an EV automotive industry, because HEI car dealerships are already at a certain level within the transition that LEI car dealerships will experience in the future. The past HEI car dealership experience could indicate the LEI car dealerships what to expect in the future. To be able to create a sustainable competitive advantage, LEI car dealerships should also develop organisational capabilities that foster rapid adaptation of innovation. This enables these dealerships to quickly react and act to signals of change.

6.4 Research limitations

This research has a few limitations that should be addressed. As this research is conducted in the automotive industry, the results of this research are only interpretable in this industry. The extent of innovation in the automotive industry has an impact on the industry structure change in the automotive industry. The results of this research can therefore not be generalised across different industries. Therefore, the external validity of this research is limited.

Another possible limitation of this research for the external validity is the number of respondents. Since the thesis had to be completed in a relatively short period of time, there was little time available to interview many respondents in the automotive industry. According to VNO-NCW (2017) there are approximately 40,000 people working in the Dutch automotive industry. For this research nine professionals in the automotive industry were interviewed. This is a relatively small sample of the total automotive industry.

Because I am active in the automotive industry myself, I might be biased on certain aspects. Therefore, I could have taken some aspects of the research as 'obvious'. These matters however could have an influence on the research and results and might not have been included in this research. This could potentially impact the reliability and validity of this research.

6.5 Future research

As this research is situated in the Dutch automotive industry it solely focused on some levels of the automotive industry value chain. Future research could take place in another country, for example Germany. When conducting the same research in another context this could confirm or reject the conclusions from this research. Conducting this research in Germany makes it possible to say something about what the effects of innovation change are on the whole automotive industry value chain. This because the German automotive industry consists of lead firms (car manufacturers) and car dealerships.

Future research could also take place within a different industry. A suggestion for further research is therefore to look at the impact of innovation on other types of industries. For example, for innovations within the energy sector, agricultural sector, or the food sector. How are these industries structures impacted by innovation? Is there a difference between disruptive or sustaining innovations within these industries? These questions are interesting for further research on the impact of innovation on industry structure change within different industries.

This research has shown that a difference in adaptability ensures that some companies adapt more quickly to innovation than others and can therefore lead the way in a transition. Reeves & Deimler (2011) describe that this adaptability is necessary to achieve a sustainable competitive advantage. Therefore, it is important to investigate what drives a company to adapt to innovation? What characteristics determine a company's adaptability? For companies that experience little extend of innovation and have little adaptability it is also important to research how these companies can develop their adaptability competencies.

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Appendix 1 Interview guide

Introduction

First of all I would like to thank you for your willingness to participate in this thesis research. This research is part of the master Strategic Management at Radboud University. The research is about the impact of innovation on the extent to which an industry structure changes. I specifically focus on the transition of the Dutch automotive industry from cars with internal combustion engines to electric cars.

I would like to ask you some questions to gain a better understanding in this transition and what its effects are on the automotive industry. In order to process the results of this interview as well as possible, I would like to record this interview. Do you agree with this? This interview will further be processed anonymously.

General questions

1. What is your current job title?
 - a. Could you describe your job title?
2. How long have you been active in the automotive industry?
3. How many subsidiaries and how many employees does the company you work for have?
4. In which business activities is the company you work for active?

Questions change

5. Have there been many changes in the automotive industry during the period that you have been active in this industry?
 - a. Can you give an example of this?
 - b. Do you consider the automotive industry to be an innovative industry?
6. How do you experience the current (2017-2030) transition in the automotive industry from ICE to EV cars?
 - a. What new products and services does this transition bring?
7. Do you consider this transition to be a radical change in the automotive industry?
 - a. Why?
 - b. How do you notice this?
8. What services does the company you work for offer for EV cars?
 - a. How long has the company been working with electric vehicles?

9. What are the goals of the company you work for regarding electric vehicles? (For example selling only new electric vehicles in 2030 and selling only electric vehicles in 2050)
 - a. Does the company only follow the European goals or does the company have its own objectives?

Business activities

10. Are certain business activities in the car industry threatened because of the entry of EV cars on the Dutch car market?
11. In which business activities is a decline in activity visible?
 - a. How is this decline visible? (For example by diversification, restructuring, divestment of industries)
12. In which business activities is an increase in activity visible?
 - a. How is this increase visible? (For example by acquisitions or collaborations)

Business assets and knowledge

13. Are certain business assets in the Dutch automotive industry threatened by the entry of EV cars? (For example locations, employees)
 - a. Which assets are no longer/ less needed?
 - b. Which assets are additionally needed?
14. What knowledge is needed to be able to deal with the entry of EV cars in the Dutch automotive industry? (For example in maintenance, sales, damage repair)
 - a. What knowledge is required?
 - b. What knowledge is no longer necessary?
15. Has the relationship with customers and suppliers changed since the entry of EV cars on the Dutch automotive industry?
 - a. How does this relation change? (For example a transfer from private ownership to leasing)

Questions about the future (transition 2030-2050)

16. How do you expect the transition from ICE to EV cars to proceed in the future?
17. Do you expect certain business activities to become more important or less important as a result of the transition?
18. Do you expect certain company assets to become more important or less important as a result of the transition?

19. How do you expect customer and supplier relationships with the dealership to change as a result of the transition?

Closing

This was my final question. Do you have any questions or any additions to this research? I would like to thank you for taking the time to contribute to this research. I will send you the transcript of the interview, so you can check whether the results of this interview are represented correctly. Would you mind if I contact you again later, if I have any follow-up questions for you? Thank you again for participating in this research.

Appendix 2 Consent form

INFORMATION AND CONSENT FORM

You are invited to participate in a research project in which the impact of innovation on the extent to which an industry structure changes is researched. This research project is being conducted by Casper van Swam of Radboud University.

The procedure involves being interviewed. The interview will take approximately 30 minutes. The interview will be audiotaped. Your contact data will be securely stored by the main researcher.

Confidentiality of the research data

The research data will be made anonymous and safely stored according to the research data management guidelines of Radboud University and conform General Data Protection Regulation. As soon as possible, any personal data will be deleted. The researcher involved in this study, will use the research data for academic publications and presentations. The anonymous data may become available in the context of Open Science so that other researchers can refer to and reuse it. For research integrity purposes, the research data will be accessible to the academic community for a period of at least 10 years.

Voluntary participation

Your participation in this research is voluntary. This means that you can withdraw your participation and consent at any time during the data collection period, without giving a reason. Even up to six weeks after participating you can have your research data /personal data/ contact data removed, by sending a request to casper.vanswam@ru.nl.

More information

Do you have any questions about this research, now or in future, please contact Casper van Swam (telephone: +316 50568607; email: casper.vanswam@ru.nl).

Should you have any complaints regarding this research, please contact the researcher or Contact the confidential Advisors Academic Integrity via email: vertrouwenspersonen@ru.nl Or Contact the Committee Scientific Integrity of Radboud University. The committee's secretary is mr. M. Steenbergen, (m.steenbergen@bjz.ru.nl or 024 3611578) Executive and Legal Affairs.

More information on the Committee Scientific Integrity can be found here:

<https://www.ru.nl/english/research/other-research/academic-integrity/>

CONSENT: Please select your choice below.

Signing this form indicates that:

- you have taken note of and you understand this information
- you voluntarily agree to participate
- you are at least 18 years of age

If you do not wish to participate in the research study, please decline participation by not signing this form.

Date, name & signature

Appendix 3 Quotes respondents

What is the automotive industry structure?

Core assets

█ als algemeen heeft 14 autobedrijven en twee Vakgarages in █ en █ en 14 schadebedrijven. (Resp_1)

Binnen de vestiging werken er een stuk of 15 medewerkers. En groepsbreed ongeveer 700 mensen verdeeld over 32 vestigingen. (Resp_6)

Maar de vraag is in hoeverre staat de oudere garde ervoor open om deze kennis nog over te nemen? Daar ligt nog wel een behoorlijke uitdaging voor de toekomst. We hebben een redelijk jonge club, maar er lopen ook 3 oudere monteurs bij die: ‘met smeer groot zijn geworden’. Dat vind ik in die zin wel een uitdaging en wel spannend. (Resp_7)

We hebben op dit moment een personeelsprobleem in Nederland. Eigenlijk hebben wij hier vijf jaar geleden al vergeten over na te denken. Dus we zijn nu een inhaalslag aan het maken. Hoe kunnen wij █ een interessante werkgever maken voor mensen die dadelijk gaan afstuderen? (Resp_9)

Daar zit het specialisme, daar zitten mensen die de juiste opleidingen gedaan hebben en weten waar ze het over hebben. (Resp_6)

Je blijft een deel in de distributieketen. Wij zijn franchisenemer van een fabriek. Daardoor blijf je afhankelijk van de producten die je voorgeschoteld krijgt. (Resp_9)

Als dealer zijnde koop je veel onderdelen bij de importeur. Daar kun je vaak niet onderuit omdat het merk specifieke onderdelen zijn. Banden en remmen zijn dingen die je wel universeel kan doen, maar het meeste zul je wel via je importeur moeten halen. De importeur heeft daarin wel een sterke machtspositie. (Resp_6)

Wij hebben te maken met de importeur, de importeur heeft momenteel met Corona ook wel wat problemen met het leveren van elektronica. Maar in de regel gaat dat gewoon goed. (Resp_7)

We kunnen nu nog uitwijken, met bepaalde onderdelen, naar grossiers. (Resp_7)

Wij hebben een mooi CRM systeem en denken er zeker over na. De klant orienteert zich op het internet en weet alles voordat deze de showroom binnenkomt, doet hier de aankoop. Wat hierna gebeurt komt ook een bedankbrief, een filmpje erbij van de directie om te bedanken. (Resp_4)

Core activities

Onderhoud en verkoop zijn wel de hoofdmoten van [REDACTED]. Daarnaast hebben ze met de partij [REDACTED] ook, zijn ze actief in de schadewereld en zijn ze ook flink groeiende. Maar ook in de autoverhuur zijn ze erg actief en worden de activiteiten alleen maar meer. (Resp_7)

Verder kijkt het bedrijf om minder afhankelijk te zijn van die merken naar meerdere poten. Enerzijds het verkopen van auto's en alles wat daarbij hoort, aan de andere kant het repareren van auto's met schade. Die twee belangrijkste poten zijn dus autobedrijf en schadebedrijf. Als derde poot, daar zijn we nu heel erg mee bezig, is de leasetak en verhuurtak. (Resp_9)

Alles wat met mobiliteit te maken heeft, dat is eigenlijk waar het steeds meer om draait. Mobiliteit in een bredere vorm, dus auto's het verkopen ervan is natuurlijk het meest bekend. Maar natuurlijk ook denk aan reparatie, denk aan verhuur, denk aan lease, denk aan schade. Maar ook dat wij steeds breder aan mobiliteit gaan deken in bijvoorbeeld een fiets. Mobiliteit in de breedste zin van het woord. (Resp_2)

What is innovation change (transition)?

Innovation

Dat heeft er ook mee te maken dat elektrische auto's momenteel significant duurder zijn dan auto's met verbrandingsmotoren. (Resp_9)

De elektrische auto's gaan zeker niet in prijs omhoog en de brandstofcomponent scheelt bij een gemiddelde auto al snel 150 tot 200 euro dat een bedrijf kan besparen door elektrische te rijden. Dan mag de elektrische auto best wat duurder zijn, dan heb je toch nog een verschil. (Resp_8)

Vanaf 2011 ongeveer. Wij hebben er al veel ervaring me zowel met [REDACTED] als [REDACTED]. Dat zijn twee pioniers op het gebied van elektrische auto's. Hebben misschien de laatste jaren wat meer stilgestaan. Ze zijn wat meer ingehaald door concurrentie, maar het is onderdeel van het gamma dat je al jaren hebt. (Resp_6)

Onze eerste auto die wij elektrisch hebben is er eigenlijk pas vanaf 2020. Dik twee jaar. Eigenlijk voor onderhoud komen nu pas de eerste mensen binnendruppelen. Daar zijn eigenlijk altijd wel klanten die met vragen daarover komen. Maar wij hebben eigenlijk nog maar net contact met elektrische auto's, dat is nog niet zo lang. (Resp_3)

Wij kregen onze eerste elektrische auto, de [REDACTED] in 2011. Dus wij hebben nu al vele jaren ervaring met de elektrische auto. Door deze ervaring zijn er door de jaren heen ook nieuwe

modellen bij gekomen. Zo kwam de nieuwe ██████ in 2018 en kwam daar vanaf 2019 een 62 kWh versie bij. Omdat ██████ al veel kennis heeft, wordt dit ook uitgesmeerd over alle andere modellen. Zo komt er straks de ██████, de ██████ en de ██████. Aan het eind van het jaar verwacht ik daarom ook dat alle modellen geëlektrificeerd zullen zijn. (Resp_1)

Technisch is alles mogelijk, maar alles heeft een prijskaartje. De prijs is wat het tegenhoudt. Je ziet ook heel erg dat als de regering stopt met subsidiëren, dat er een dip komt in de verkoop. En op het moment dat de nieuwe subsidiepoten weer opengaan dat er ineens weer meer elektrische auto's worden verkocht. Dat heeft er ook mee te maken dat elektrische auto's momenteel significant duurder zijn dan auto's met verbrandingsmotoren. Degene die aan de knoppen draaien bepalen hoe snel de transitie gebeurt. Als de knoppen volledig opengaan dan hebben wij over twee jaar alles elektrisch. (Resp_9)

Ja, enorm flexibel en innovatief. Wat ik niet gedacht had, aangezien de auto (en industrie) wel een traditioneel iets is. Je ziet duidelijk wel dat als er afspraken gemaakt worden op het gebied van uitstoot, hoe flexibel dan de auto-industrie is om dat juist te doen. (Resp_5)

Verkoop technisch weet ik niet, volgens mij niet. In de werkplaats hebben wij daar ook geen doelstelling voor, voor elektrische auto's. Het bedrijf volgt daarbij de doelstellingen vanuit de overheid dat de nieuw verkochte auto's in 2030 uitstootvrij zijn. Daar zijn wij wel volop mee bezig om dat te realiseren. (Resp_7)

How does innovation change impact the automotive industry structure?

Change in company core assets

Je ziet door de afname in werk in de werkplaats nog niet dat we personeel te veel hebben. Dat komt ook omdat wij er alles voor doen om de klant te behouden en daardoor werk te behouden. (Resp_5)

Het komt op zich goed uit als je het hebt over de aanwas van nieuwe monteurs. Aangezien die relatief beperkt is. Het aantal monteurs wat je nodig hebt is nu op peil met het werkaanbod wat er is. (Resp_1)

Locaties, denk ik toch niet dat je daarop bedreigd wordt. Het is wel belangrijk dat mensen je weten te vinden op het moment dat er iets mis is met de auto. (Resp_7)

De werkplaats moet geaard zijn, speciale pakken, noem het allemaal maar op. Uiteindelijk zul je ook speciaal gereedschap nodig hebben, om bijvoorbeeld de accu's uit de auto te kunnen halen. (Resp_7)

De huidige kennis zal niet verloren gaan. Maar er zal vooral extra kennis opgedaan moeten worden om op een juiste manier met elektrische auto's te kunnen werken. En als je geen kennis hebt van je producten kom je natuurlijk nergens. En daarom moet je kennis van ICE-auto's ook behouden en ontwikkelen. Dat is zo belangrijk, en daarmee kun je onderscheiden. (Resp_3)

Nouja kijk, het werk aan een elektrisch voertuig is een specialisme. Daar horen certificeringen bij, daar horen opleidingen bij. Dus ik zie het niet zozeer als een bedreiging voor de bestaande kennis, maar je zult wel andere kennis op moeten doen om in de werkplaats op een juiste manier met elektrische voertuigen te kunnen werken. (Resp_6)

De benodigde kennis is inderdaad voornamelijk nodig in de werkplaats, ja. Maar sales moet helemaal blijven met wat er gebeurt, want een klant komt ook met vragen over nieuwe onderwerpen zoals vehicle to the grid, en vehicle to home. Daar moeten zowel sales als aftersales van op de hoogte zijn. (Resp_1)

In de basis blijft het spelletje hetzelfde, maar je moet de klant meer meenemen in het proces. De klant wordt ook iets afhankelijke van je omdat de ICE-auto die is eigenlijk al 100 jaar hetzelfde. Bij een elektrische auto dat is een heel ander product, waarbij de klanten ook opnieuw moeten wennen. Dus ik denk dat het voor ons leuker wordt. (Resp_8)

We hebben natuurlijk verschillende toeleveranciers voor onderdelen. Daar zien we dat we andere dingen gaan inkopen. We kopen bijvoorbeeld minder olie, maar bijvoorbeeld ruitensproeiervloeistof en banden hebben alle auto's nodig, elektrisch of niet. Dus je gaat niet zo'n Brezan-achtig bedrijf afstoten. Relaties met leveranciers blijven dus hetzelfde, maar er zit wel verschil in de soorten producten die bij deze leveranciers afgenomen worden. (Resp_1)

Door de elektrische auto moeten andere producten ingekocht worden. Ik denk niet dat relaties met leveranciers onder druk komen te staan, maar dat je op een andere manier gebruik moet maken van je leveranciers. Je moet zuinig zijn op je relaties, daar altijd mee in contact blijven en dat is heel belangrijk. (Resp_2)

Change in company core activities

We hebben nog een leasetak [REDACTED]-leasebedrijf, daarnaast nog een grote autoverhuurtak waar momenteel, zo schat ik ongeveer, 800 tot 900 auto's rondrijden. En daarnaast nog, vrij recent, een bedrijfswagen truck rental maatschappij overgenomen in de [REDACTED], [REDACTED]. En een grote club binnen onze groep is ook nog de autoschade tak van [REDACTED], met inmiddels ook 15/16 vestigingen. Dat gaat de laatste tijd heel hard. Een grote vlek, zeg maar vanaf een beetje Arnhem/Nijmegen tot aan Groningen toe. (Resp_4)

Ja die hebben wij ook. Wij hebben nu een bedrijf waar wij mee samenwerken die de laadoplossingen (laadpalen) voor elektrische auto's aanbiedt. Zodat de klant bij de dealer de auto kan opladen en wij dit als service, bijvoorbeeld bij het uitvoeren van een beurt, kunnen toevoegen. Dat is een hele uitbreiding en een bedrijf waar wij nu mee samenwerken, en dat is fijn want wij kunnen daardoor ook de particulier die een laadbox wil hebben hierover adviseren. (Resp_1)

We zijn in [REDACTED] als [REDACTED] hebben wij daar een batterij repair centrum geopend. Daar worden batterijen gerepareerd en worden accucellen vervangen. Dat is ook een kans die we hebben, waar wij ook in kunnen groeien. Daar zitten kansen om omzet te vergroten in, omdat er momenteel 3 batterij repair centrum zijn in Nederland, waaronder [REDACTED] in [REDACTED]. (Resp_6)

Die moet je gaan zoeken, anders raak je je bestaansrecht kwijt. We zijn nu wel volop bezig met uitbreiding van schade, uitbreiding van verhuuractiviteiten en lease. Om toch te zorgen dat we volume vast te kunnen houden. En zullen wij met andere concepten moeten komen om klanten te blijven binden. Bijvoorbeeld het verkopen en onderhouden van fietsen, naast auto's. Ik denk dat wij ook mobiliteit zullen gaan krijgen in abonnementsvorm. Niet alleen Ben en Vodafone, maar ook [REDACTED]. Die ontwikkeling begon in de supermarkten. De kruidenier verdween, de slager verdween en dat werd allemaal samengebracht in één omhulsel. En je ziet nu een beetje dat de autobranche daar ook naar opzoek is. Je ziet die ontwikkeling ook al bij Pon (de automotive holding) die hebben Gazelle (de fietsenfabrikant) gekocht. [REDACTED] als bedrijf zijnde moet in Nederland wel veder. (Resp_9)

Kijk het is wel zo dat het rendement was in het verleden vanuit de werkplaats, dat is nu niet meer zo. Daardoor zie je een focusverschuiving van de werkplaats naar verkoop en verhuur. De verkoop levert een hele goede bijdrage (moet een goede bijdrage leveren) om het autobedrijf rendabel te houden. Dat zien we ook in de toename van verhuur: shortlease, waarbij je

bijvoorbeeld voor zes maanden een auto kan huren, daar spelen we momenteel erg veel op in. (Resp_1)

Doordat de omzet van de werkplaats nog niet beïnvloed wordt door de toetreding van elektrische auto's ervaren wij geen focusverschuiving van onze bedrijfsactiviteiten. De werkplaats blijft een belangrijk onderdeel van ons businessmodel. (Resp_2)

Dat we de werkplaats gaan afstoten, zie ik nog niet gebeuren. Ik kijk nu even naar [REDACTED] zelf, maar we zullen altijd reparatie en onderhoud blijven uitvoeren. Service intervallen zullen altijd blijven bestaan, omdat je bij een elektrisch voertuig natuurlijk ook moet kalibreren. Alleen olie wisselen bijvoorbeeld, dat vindt niet meer plaats. (Resp_5)

Met name de werkplaatsomzet. Je hebt nu een aantal margemakers zoals bijvoorbeeld olie. Als je straks geen olie meer hoeft te verversen dan ben je een hele belangrijke margemaker kwijt. Kijk een liter olie kost grootinkoop [REDACTED] en verkoop ik voor [REDACTED], dus dat is wel een marge maker en die raak je volledig kwijt met de elektrische auto. Daar moet wel compensatie voor gezocht worden in de vorm van bijproducten of andere services die je gaat toevoegen. Dus de werkplaats die gaat de komende jaren het meest merken van die transitie. (Resp_9)

Bij ons is de werkplaats nog niet beïnvloed door de afname in olieomzet, doordat wij nog maar één model de [REDACTED] hebben. Dat zal dadelijk misschien nog wel gaan veranderen, maar voorsnog is alleen de [REDACTED] maar bij ons in beeld en merken daar nauwelijks de gevolgen van. (Resp_3)

Je ziet met name de wagenparken van de verhuurmaatschappijen groeien. Ze hebben meer auto's nodig om aan de vraag te kunnen voldoen. [REDACTED] heeft een verhuurbedrijf overgenomen [REDACTED]. Daardoor hebben ze nu een wagenpark van ongeveer 800 auto's. Daar zit wel enorme groei in. [REDACTED] ontwikkelt daar ook in om bij te blijven en zoekt ontwikkeling en groei daarin. (Resp_6)

We zijn nu wel volop bezig met uitbreiding van schade, uitbreiding van verhuuractiviteiten en lease. Om toch te zorgen dat we volume vast te kunnen houden en schaalvoordelen kunnen behalen. (Resp_9)

Appendix 4 Results table

In this appendix an overview of the results of the research are given. This results table is based on the operationalisation as mentioned in (chapter 3.4). In this table the similarities and differences between LEI car dealerships and HEI car dealerships are given. To clearly indicate the differences, these differences are shown in red.

		Little extent of innovation (LEI)	High extent of innovation (HEI)
<u>Innovation outcome</u>	New products	- Product development - At least one electric vehicle	- Product development - Multiple electric vehicles
	New services	- No new services	- Recharging electric vehicles service
<u>Innovation process</u>	Stages of innovation	- First electric vehicles in period 2020-2022	- First electric vehicles in period 2011-2014
	Checkpoints of innovation	- Goals 2030, 2050 - Electric vehicle subsidised	- Goals 2030, 2050 - Electric vehicle subsidised
<u>Innovation mindset</u>	Innovation climate	- Innovative industry, technical developments & governmental regulations - No additional goals	- Innovative industry, technical developments & governmental regulations - No additional goals
<u>Change in company assts</u>	Possessions	- No threats for obsolescence	- No threats for obsolescence
	Skills and knowledge	- Existing skills and knowledge are not threatened with obsolescence - Extra training necessary	- Existing skills and knowledge are not threatened with obsolescence - Extra training necessary
	Relations with customers and suppliers	- Relations are not threatened with obsolescence	- Relations are not threatened with obsolescence

		- Maintaining relations is important	- Maintaining relations is important
<u>Change in company activities</u>	Business diversification	- No need for business diversification	- Different diversifications related to the ICE automotive industry, the EV automotive industry or unrelated to the automotive industry
	Refocusing or eliminating non-core businesses	- No need for refocusing non-core businesses - No need for eliminating non-core businesses	- Shift in focus from workshops to other divisions (rent, lease, damage repair) - No need for eliminating non-core businesses
	Low-performing divisions	- No low performing divisions because of the transition	- Workshop is a low performing division because of the transition
	Increase market share	- No need to increase market share	- Need to increase market share to create economies of scale - Increase by mergers and acquisitions