



Sales Funnel Process – Development of a Price-steering Model Based on Customer Data in Electromobility

Masterarbeit

zur Erlangung des akademischen Grades „Master of Science (M.Sc.)“ im Studiengang Wirtschaftswissenschaften der Wirtschaftswissenschaftlichen Fakultät der Leibniz Universität Hannover

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Hannover, den 04.03.2019

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1. Introduction

1.1 Relevance and Motivation

“Before Google, and long before Facebook, Bezos had realized that the greatest value of an online company lay in the customer data it collected.”¹

George Packer, The New Yorker

Data is the new oil. Experts from business and science agree on this. Apple, Amazon, Google, Microsoft and Facebook are the most valuable companies of today.² The recipe for success of these companies: Digital business models that are geared to the needs of the customer. Only those who are close to their customers will be able to quickly and sustainably adapt and further develop their own products and services as well as realize new ideas immediately and thus survive in future competition.³ Quotes from Steve Jobs "you have to start with the customer experience and work back towards the technology - not the other way around"⁴ and Jeff Bezos "if you're competitor-focused, you have to wait until there is a competitor doing something. Being customer-focused allows you to be more pioneering"⁵ show that customer orientation and customer experience play the most central role in these companies and thus trigger a revolution in the design of business models. The dominance of Amazon is driving this revolution forward and the resounding success shows that data must guide every decision within the customer-oriented company. Since its inception, Amazon has used every single piece of buyer information to strategize its next steps to best serve its customers, from innovative new offerings to fulfillment programs to market-moving acquisitions. Every business decision is data-based and contributes to a seamless, consistent and valuable end-to-end customer experience.⁶ From a business perspective, customer data is the key resource, along with customer centricity.

According to McKinsey, customer data should be seen as a strategic element. According to studies, companies that use customer data for analysis have a sales growth of up to 85% and a gross margin increase of over 25%.⁷ McKinsey names three key areas in which customer data and its analysis lead to optimization: First, the personalization of the customer approach and the associated recognition of the real customer needs. According to studies, personalization

¹ George Packer (2014), The New Yorker: Cheap Words, <https://www.newyorker.com/magazine/2014/02/17/cheap-words> (20.02.2019)

² The Economist (2017): The world's most valuable resource is no longer oil, but data, <https://www.economist.com/leaders/2017/05/06/the-worlds-most-valuable-resource-is-no-longer-oil-but-data> (20.02.2018)

³ Handelsblatt (2018): Wie digitale Geschäftsmodelle Unternehmen zum Erfolg verhelfen, <https://unternehmen.handelsblatt.com/digitale-geschaeftsmodelle.html> (20.02.2019)

⁴ Steve Jobs (1997), World Wide Developers Conference

⁵ Jeff Bezos (2008)

⁶ Mike Sands (2018), Forbes: How Amazon is Minting A New Generation Of Customer-Data-Obsessed Companies, <https://www.forbes.com/sites/mikesands/2018/03/02/how-amazon-is-minting-a-new-generation-of-customer-data-obsessed-companies/> (20.02.2019)

⁷ McKinsey (2017): Capturing value you're your customer data, <https://www.mckinsey.com/~media/McKinsey/Business%20Functions/McKinsey%20Analytics/Our%20Insights/Capturing%20value%20from%20your%20customer%20data/Capturing-value-from-your-customer-data.ashx> (20.02.2019)

enables a five to eightfold Return-on-Investment for marketing expenses and a potential increase in sales of more than 10 percent. Secondly, data-driven decision making for the re-allocation of marketing expenses based on the identification of the customer journey. Here, too, studies show that the efficiency of marketing alone can be increased by 10 to 15% and that up to 80% of the digital marketing budget can still be reallocated. Thirdly, the decision on pricing and price control. Here, too, studies show that data-based pricing has increased profit margins by an average of 3 to 8 percent across all industries.⁸

Amazon also uses customer data as part of Big Data Analytics to optimize price control. In addition to customer data, competition data, product data, profit expectations and other relevant data are analyzed and prices are changed in only 10 minutes. With this dynamic pricing Amazon typically offers discounts on best-selling items and earns more on read-popular items. Overall, dynamic pricing at Amazon leads to an average annual profit growth of 25%.⁹ Other companies such as Ryanair also use dynamic pricing to optimize price control. The question here is how marketing and sales can be controlled on a data-based basis and how optimization potential can be achieved.

Digital sales funnel is an instrument in the area of marketing and sales. The sales funnel is a visual representation of the customer journey from the first contact with a potential customer to a completed purchase.¹⁰ For marketing and sales, the sales funnel instrument means that by converting customers and providing customer-specific data, digital KPIs can be measured and used to make data-based optimization decisions. Thus, sales funnel as an instrument enables the identification of customers and thus the potentials of personalization, data-based decision making and price control as demonstrated by McKinsey.

The Gartner Hype Cycle for digital marketing and advertising also shows that the analysis of customer journey, customer data platforms and the predictive analytics function made possible on this basis are currently at the peak of exaggerated expectations, with productivity being achieved within the next two to five years.¹¹ It becomes clear that customer data and the use of the sales funnel tool mean a multitude of potentials for companies. Nevertheless, studies show that so far about 68% of companies do not use sales funnel or do not use it to its full potential.¹²

A similar picture emerges in the automotive industry. Dr. Dieter Zetsche, Chairman of the Board of Management of Daimler AG, has clear words to say: "Without change, we are done

⁸ McKinsey (2015): Marketing & Sales Big Data, Analytics and the Future of Marketing & Sales, <https://www.mckinsey.com/~media/McKinsey/Business%20Functions/Marketing%20and%20Sales/Our%20Insights/EBook%20Big%20data%20analytics%20and%20the%20future%20of%20marketing%20sales/Big-Data-eBook.ashx> (20.02.2019)

⁹ Jennifer Wills (2018): 7 Ways Amazon Uses Big Data to Stalk You, <https://www.investopedia.com/articles/insights/090716/7-ways-amazon-uses-big-data-stalk-you-amzn.asp> (20.02.2019)

¹⁰ Pipedrive Blog, <https://www.pipedrive.com/en/blog/sales-funnel> (20.02.2019)

¹¹ Gartner (2018): Gartner Hype Cycle for Digital Marketing and Advertising (see Appendix I), https://blogs.gartner.com/smarterwithgartner/files/2018/11/PR_051_554925_3_Insights_From_Gartner_Hype_Cycle_for_Digital_Marketing_and_Advertising_2018.png (20.02.2019)

¹² Pipedrive Blog, <https://www.pipedrive.com/en/blog/sales-funnel> (20.02.2019)

for.”¹³ Zetsche refers to the transformation of the automotive industry, in which car manufacturers have to transform from a pure car manufacturer to a mobility provider due to the future fields of connectivity, autonomous driving, shared mobility and electromobility. In this transformation, the customer and the needs of the customer are at the forefront. The aim is to offer the customer a digital ecosystem in which mobility is offered as a service. As with Amazon, Apple, Google, etc., the focus is always on the customer and the customer experience. The business models will also be adapted in this process, although the sale of a vehicle will initially continue to be in the foreground, mobility services will become more and more relevant.

Looking at today's automobile sales, a disruptive change is also imminent here. Customers are increasingly using the Internet to obtain information instead of going to a dealer. A study showed that 88% of respondents no longer trust the traditional distribution channels of the automotive industry to be suitable for future growth.¹⁴ Automobile manufacturers have recognized the dangers and digitalization is taking hold in car dealerships. Digital products are built up, online presences of dealers and companies are created, but there is a lack of a consistent IT concept, especially across the different sales levels. Although the sales funnel instrument has been recognized, much remains in the dark today when it comes to processing the sales funnel. The integration of the customer journey via digital and physical channels, the identification of customers and the measurement of conversion rates via the sales levels is not taking place. There is no data-based control, no dynamic adjustment of prices, no data-based analysis of customers and no determination of willingness to pay.¹⁵ Compared to customer-centric and digital business models and the use of sales funnel instruments such as Amazon, there are significant differences. Differences that can be countered in the newly emerging business areas of electromobility.

The boom in electromobility and the market ramp-up of the first purely electric vehicles in conjunction with the digital ecosystem offer a new opportunity for automobile manufacturers to exploit the potential of digitization. In order to meet new customers and their requirements, the use of digital products and services is required. Tesla can be mentioned as a pioneer in the market ramp-up of electric mobility, but the Tesla strategy has also made some progress in controlling sales funnel. Tesla was the first car manufacturer to introduce a distribution system based exclusively on direct sales, both online and in the physical world. Recently, Tesla has announced that the full distribution of Tesla vehicles will take place exclusively via the Internet and that no physical dealer structure will be available.¹⁶ Tesla has also changed the way cars are purchased by setting up a registration and pre-order function for their vehicles, where customers

¹³ Manager Magazin (2019): „Ohne Wandel sind wir erledigt“, <http://www.manager-magazin.de/digitales/it/dieter-zetsche-ohne-wandel-sind-wir-erledigt-a-1255195.html> (27.02.2019)

¹⁴ EY (2015): Future of automotive retail, <https://www.ey.com/de/de/industries/automotive/ey-automobilhandelder-zukunft> (20.02.2019)

¹⁵ Deloitte (2015): Automotive digital: Das Rennen gewinnen, www.deloitte.com/de/connected-car-2015 (20.02.2019)

¹⁶ Manuela Imre (2019), Handelsblatt: Tesla verlagert alle Verkäufe ins Internet, <https://www.handelsblatt.com/unternehmen/industrie/autobauer-tesla-verlagert-alle-verkaeufe-ins-internet/24053770.html> (01.03.2019)

can deposit a down payment for a vehicle when making a purchase request.¹⁷ German car manufacturers, such as Audi and Daimler, have also introduced the online registration function.¹⁸ The primary goal here is to collect data on potential customers, following the example of digital companies, and to use this data to control and optimize marketing and sales using the sales funnel tool. It remains to be seen how the generation of customer data can be used in the automotive industry and which potentials can be exploited.

This is precisely where the relevance and motivation of this work lie. Within the scope of this work, concepts and models are developed that provide an answer to the question of how customer data can be used in the automotive industry, especially in the new field of electromobility, to optimize marketing and sales, and what influence customer data has on the company. To this end, the areas of personalization, data-driven decision-making and price control in the context of electromobility will be investigated.

1.2 Research Objective, Question and Structure

The aim of this thesis is to develop concrete approaches for the digitalization of marketing and sales in the automotive industry in order to transfer successful models and advantages of digital business models to automotive manufacturers. The (digital) sales funnel is regarded as an instrument for digitization and optimization. As shown above, the field of electromobility offers a great opportunity for automobile manufacturers. New customer requirements, digital ecosystems, new products as well as new technology- and innovation-oriented customer segments enable and require the adaptation of marketing and sales processes. In addition, the market ramp-up of electric vehicles is currently in its infancy. This means that it is not yet possible to fully exploit the production potential of automobile manufacturers to produce electric vehicles in volumes similar to those of conventional combustion vehicles. As a result, supply bottlenecks are expected at the time of market launch, as customer demand is significantly higher than the number of vehicles that can be produced.¹⁹ From a marketing perspective, it is all the more important that the right customers are supplied with a vehicle, thus creating customer satisfaction, which is generally regarded as a success factor for the introduction of new products. From the sales perspective, it is also helpful to serve customers who are more willing to pay and thus increase sales. The key to success can be the analysis of customer data, as in the model of digital business models such as Amazon. The digital sales funnel is a good basis for generating customer data. But not only the digital sales funnel can be used as a source for customer data in the automotive industry; existing customer relationship management systems already have customer and vehicle data. However, questions remain unanswered as to which characteristics the customers suitable for electric vehicles have, how

¹⁷ Lukas Bay (2017), Handelsblatt: Querköpfe erobern die Autoindustrie, <https://www.handelsblatt.com/unternehmen/industrie/elektromobilitaet-direktvertrieb-statt-haendlernetz/20384450-3.html> (20.02.2019)

¹⁸ Audi: <https://www.audi.de/de/brand/de/kampagnen/e-tron-erleben.html> (20.02.2019) and Daimler: <https://mercedes-benz-eqc.de/registrierung/> (20.02.2019)

¹⁹ Autohaus (2019): Zetsche sagt Lieferengpass voraus, <https://www.autohaus.de/nachrichten/mercedes-eqc-zetsche-sagt-lieferengpass-voraus-2261346.html> (20.02.2019)

the right customers can be identified and how the customer data can be specifically used to optimize marketing and sales. From this, the first research question to be answered as part of this work can be derived as follows:

How to identify the relevant customers for electric vehicles and how to optimize digital sales funnel process based on this identification?

Digital companies such as Amazon use customer data as the key to success. This work also uses customer data to answer the first research question. Relevant customers are to be identified first and foremost and then used to optimize marketing and sales. Amazon goes one step further. Customer data is also used for price control within the framework of dynamic pricing, thereby increasing profits. In the automotive industry, customer data is not currently used in price control. From the examples of digital companies, however, it becomes clear that data-based price control reveals considerable potential for increasing sales and profits. Since customer data within the automotive industry has largely not been analyzed to date, it remains to be seen how customer data can affect price control in this environment. In the context of this work, these effects are to be investigated using the example of electric vehicles, from which the second research question of this work can be derived as follows:

How can customer data influence the price control of electric vehicles and which potentials can be realized with this data?

These defined research questions will be answered in the nine chapters of this thesis. First, chapter two presents the theoretical foundations of data-based business models, sales funnel, sales channels and price control methods. It is important to understand the customer in order to achieve a customer-centric view and orientation of the process. Therefore, in chapter three requirements and theoretical characteristics of customers of electromobility, as well as differences to customer groups of conventional drive technologies and the relevance of electromobility for the German automotive industry are elaborated. Furthermore, chapter four shows the influence of customer data on the business value on the basis of theoretical considerations and presents models for the analysis of customer data and for data-driven decision-making out of literature. In chapter five, the fundamentals of the Mercedes-Benz EQ application case on which this thesis is based are first presented and the decision criteria for customer data analysis are established. Based on this, the data sources and data sets generated for analysis in this thesis are presented and prepared for analysis. Using the established decision criteria, algorithms for data analysis are then developed and, finally, the analysis results will be evaluated, recommendations for action will be derived and the results will be validated. In chapter six, the analysis results are used to set up various models for optimizing the digital sales funnel. A framework is developed, which enables data-driven decision-making regarding the optimization of the sales funnel process on the basis of customer data. Chapter seven also uses the results of the customer data analysis to develop a reference model for the price control of electric vehicles. The different sales levels of the sales structures in the automotive industry are taken into account and the results of the modelling are validated on the basis of the customer data analysis. Since only data from Mercedes-Benz EQ, in particular for the vehicle EQC, are

available for this thesis, a generalization approach of the developed models will be presented in chapter eight. This will ensure a transferability of the customer data analysis and the models for the optimization of the sales funnel and for price control to further application cases. Finally, chapter nine summarizes and discusses the results of this thesis, identifies the limitations of the work and gives an outlook on future developments and further research needs.

9. Conclusion

9.1 Summary and Discussion

The objective of this work is to optimize the entire control of digital sales funnel up to price control of a product on the basis of customer data. First of all, the field of electromobility was considered a limitation. The results obtained are summarized and discussed briefly below.

First, the theoretical basics of data-based business models, digital sales funnel, sales models and price control models were presented. It became clear that in the future sales world, data-driven decisions in almost all areas are a basic prerequisite for the competitiveness of a company. This applies in particular to the future orientation of the automotive industry. Based on these findings, facts in the field of electric mobility were presented and the potential focus customer group of electric vehicles was characterized on the basis of the literature. Furthermore, the theoretical influence of customer data on the value of a company was worked out. Methods for the analysis of customer data as well as derivations with regard to data-driven decision making in the areas of marketing, sales and controlling, in particular for investment decisions in digital sales funnel, were examined in detail. The basics were then used to develop concrete concepts and models for customer data analysis and, based on this, for controlling the digital sales funnel and price control in the field of electromobility.

Based on the theoretical characterization of the electric vehicle-specific target customers, decision criteria for a data-based segmentation of customers were developed in Chapter 5. Since the data available in the context of this work refer to the application case of Mercedes-Benz EQ and the first purely electric vehicle, the EQC, the general decision criteria were set in connection with vehicle-specific parameters of the EQC. The resulting decision parameters were used to analyze customer data from two different sources. Data from the Mercedes-Benz CRM systems on the one hand and data from an online registration function specifically for the EQC from six different markets on the other were available as a database. To analyze this customer data, two algorithms were developed which divide the customers into three different segments according to a scoring procedure. The customer data were enriched with external data, analyzed based on algorithms and subsequently interpreted. In parallel to insights into the various market characteristics of the markets studied, potential customers for the purchase of an EQC in the various markets and CRM systems were identified. In addition to the identification and classification of potential customers, it was also examined where the customers with the highest scoring value should be located via the usage of heatmaps. Overall, the analysis resulted in a large number of recommendations for action for the different markets in the areas of marketing and sales. Furthermore, an initial validation was carried out in order to link the online registration data with the offline CRM data.

The selection of criteria for the development of decision variables and their weighting factors must be questioned. Since there has been little experience of the real target customer in the context of electromobility to date, the decision variables are mainly based on the information in the literature. These can be regarded as very general and cannot undoubtedly be applied to

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the application case of the EQC. For application it is recommended to verify the decision variables. However, a verification of the decision variables is only possible when the first vehicles are sold and conclusions can be drawn about the accuracy of the scoring procedure. Since the EQC is due to go on sale in the future at the time this thesis is written, no validations of the scoring procedure can yet be carried out. This means for the meaningfulness of the scoring value for each customer that this value cannot initially be classified as a purchase probability. It is therefore questionable whether the customer data analysis using the developed algorithms will also identify those customers who will actually buy a vehicle. Nevertheless, the decision criteria in the field of electromobility should be regarded as generally valid. Low daily mileage, charging possibilities, willingness to pay for mobility and income levels are general indicators of the suitability and interest in electromobility and thus also useful as decision variables of the algorithms. It remains open, however, which additional factors and which weighting of the individual parameters are decisive for the purchase of an EQC by customers. Therefore, the algorithms do not primarily serve to derive purchase probabilities but offer a first possibility to get an overview of the complex automotive market from the company perspective. The segmentation into three customer groups therefore appears to make sense in order to reduce complexity. The results of the data-based segmentation are mainly used to increase efficiencies in marketing and sales. With the production restrictions on which this work is based, a focused customer approach can be made possible and thus costs and resources can be saved in the end. In addition, the algorithms were developed in such a way that the use of machine learning concepts can be made possible after the integration of a customer's real purchase data, thus creating further potential for increasing efficiency. With regard to the customer data, the quality of the data must also be questioned. While reliable time-related customer data is analyzed within the CRM systems, the online registration data is not used to filter for the serious interest of a customer. Only the confidence for the degree of completion of the online survey is determined but is largely not taken into account for the analysis. It is therefore recommended to develop a filtering mechanism from a sales point of view that only takes into account registrations that are of serious buying interest. Furthermore, the analyses for the data sources of the registration and the CRM systems are carried out separately. The analysis results are not linked. In the context of this work, a first approach to linking was developed, but for the future development of the scoring procedure, close linking of the data sources is of great importance in order to gain an even better knowledge of the individual customer. Another point to be discussed is the exchange of information between the different sales levels. So far, only data made available within the framework of pilot projects at dealer or market level have been analyzed. The online registration data is only available at headquarters and market level. As long as online direct sales are not possible, the only way for the customer to buy an EQC is via a physical dealer in the Mercedes-Benz EQ distribution network. Since the knowledge about the customer generated by the customer data analysis not only generates advantages in market cultivation at the market level, but also in direct contact with the customers, it is imperative that information exchange of customer data and analysis results be made possible across all sales levels. Restrictions concerning the data property, the data transfer and the data processing, which are placed by the GDPR, are to be considered thereby. Therefore, it is to be paid attention to the fact that a data protection agreement with the customers is met that their data may be processed for analysis purposes within the company. Overall, the analyses carried out

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nevertheless show that the goal of reducing complexity for the markets and identifying relevant customers has been achieved and that data-based recommendations for action in the areas of marketing and sales have been generated. In addition, dashboards were developed to visualize the results of the online registrations and thus support the decision-making process. The first research question to be investigated in the context of this work can thus be answered by the developed concept for customer data analysis. For the optimization of the digital sales funnel this concept is not sufficient however yet. So far, the analysis only considers the identification of the right customers, the customer journey is not considered. Therefore, a framework for the holistic optimization of the digital sales funnel was developed, whose approaches are briefly summarized in the following.

In chapter 6, a layer model was developed that supports the overall optimization of the digital sales funnel. The levels developed for this purpose provide data-based recommendations for action for these optimizations. While on the first level the conversions of the customers between the digital products within the digital sales funnel are used to measure the business impact of the digital products, on the second and third level the customer journeys of the customers are analyzed and optimization decisions are derived. While the second level focuses on IT-technical optimizations, the third level provides data-based recommendations regarding customer acquisition costs (marketing) and lead value (sales). By means of these levels, on the one hand the consideration of the optimal customer journey and on the other hand data-based investment decisions into the digital products are made possible. This enables targeted investment in digital products and thus even more efficient customer guidance through the digital sales funnel. In order to analyze the digital sales funnel, KPIs were also developed that enable an evaluation of the digital products. Furthermore, the first level for determining the business impact of digital products is based on mathematical models, so that it can be transferred to other applications. Overall, the developed framework provides a holistic approach to optimize the digital sales funnel based on the identification of the right customers in such a way that customers are kept within the sales funnel and efficiently led to the purchase of the product.

In general, it can be questioned which approach of optimization can be classified as more suitable. On the one hand, optimization could only refer to an aggregated level, i.e. the macro perspective, and on the other hand, optimization could be triggered by considering the micro funnel. The developed framework includes both approaches, whereby the macro level view is rather used as a controlling function and the optimization is implemented on the basis of micro funnel views of the individual digital products. The consideration of the micro funnel perspective allows a more detailed understanding of the customer journey. The consideration of the customer journey ranges from the acquisition of the customer through various advertising measures to the purchase of the product. Thus, not only can the customer journey be optimized within the sales funnel, but conclusions can also be drawn for the control of marketing campaigns. The measurement of conversion rates supports this and enables the use of targeted next best actions within the sales funnel on the one hand and the measurement of the efficiency of marketing campaigns according to the number of acquired hot leads on the other hand. Among other things, this is supported by the insights gained from the analysis of customer data. Here too, however, no real sales of an EQC have taken place so far, so that the model developed

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has not yet been validated. Nevertheless, the level model as a whole makes a contribution to the improved orientation of digital products and initially enables a holistic understanding of the digital sales funnel. The developed KPIs, such as the conversion rates between the channels, the customer acquisition cost and the lead value, are used to measure the processes. Although the literature supports an application of these digital KPIs, the definition of KPIs is broad. In the context of this work, therefore, narrower definitions of the KPIs were developed, which must be examined when applying the model in practice. It is not yet possible to say whether the KPIs in digital sales funnel are the right ones or which target values apply to the KPIs, since the empirical values are lacking both in the literature and in practice. Overall, the model developed is essentially based on the measurement of conversion rates. To date, it has not been possible to measure conversion rates holistically from a data protection perspective. In order to apply this model, it is therefore first necessary to find a solution to these restrictions. If these conditions are fulfilled, the level model provides, in addition to the approaches for content optimization of the digital sales funnel, a possibility for data-based investment decisions and the evaluation of the business impact of digital products. Some attempts have already been made in the literature to assess the business impact of digital products. A generally accepted solution has not yet been found. The model developed here provides a first approach for determining the business impact of digital products based on the detailed measurement of conversion rates. Contrary to the previous definitions in the literature, the conversion rates between each individual feature of a product were modelled. As soon as real sales data are available, it must therefore be validated whether the data-based recommendations for action can be implemented with the developed model and whether the desired optimization effects can continue to be achieved. Overall, the level model developed for the holistic optimization of digital sales funnel provides a further answer to the first research question that was examined in the context of this thesis. The data-based analyses both in the area of customer data and in the area of the digital sales funnel jointly provide a solution for identifying the right customers in the area of electric mobility and continue to provide the basis for efficiently guiding both the right customers and new customers through the digital sales funnel. It remains to be seen how the results of the analyses can be used not only to optimize the sales funnel, but also to increase the company's profits. For this reason, the influence of customer data on price control in the field of electric mobility was investigated. The results of the investigations are briefly summarized in the following.

On the basis of new dealer contracts in the case of Mercedes-Benz EQ, it was determined that 5% of the dealer margin is deducted by the dealers to control discounts. From the company's perspective, the goal is to control the 5% so efficiently that the dealers neither experience a decrease in sales due to a lack of customers, nor are the entire 5% spent on customer acquisition in order to enable profit potential. Within the scope of this work, two models were developed on the basis of existing concepts for data-based decision making, which enable a control of the discount level on the one hand on the market level and on the other hand on the individual customer level or the retail level. Both models are based on the analysis of customer data carried out in the previous chapters. While the analysis results of the online registration data were used to control the market level, the data from the pilot project at the Mercedes-Benz branch in Munich were used for the individual customer level. Overall, the analyses in both cases show

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a positive influence of the customer data analysis on price control. This means that in both cases, the inclusion of customer data analysis as a decision variable for data-based decision-making reduced the discount level and thus generated profit potential from the point of view of the company. The models also showed that further potentials could be made possible by increasing efficiency in volume planning using customer data analysis. However, a monetary evaluation of these potentials was not carried out.

The question of the extent to which the developed models can be implemented in practice remains unanswered. The models developed here are mainly based on the Mercedes-Benz EQ dealer contract. However, if other companies or Mercedes-Benz extend the discount control to other applications, these models could be applied. The models were constructed mathematically in such a way that the value of the decision variable can be determined independently of the calculation. Due to data protection restrictions, no restrictions are to be expected, at least for control at market level, so that implementation is possible. However, it must be questioned to what extent the strong dependence of the scoring procedure can be evaluated as meaningful. The discussion of the analysis procedure for customer data has revealed a number of open points, so that it is currently not advisable to implement the model for price control. Although there are still six different markets available for the analysis, the number of registrations in relation to the planned sales volume can be classified as very low, which may limit the informative value of the analyses. Furthermore, the linking of online and offline data as well as the further development of the scoring procedure and the decision criteria should be advanced so that the scoring value can actually be interpreted as a purchase probability. Nevertheless, the discount control model provides a statement that potentials can be generated by integrating the variable of the customer data analysis. In addition to the discount control, the variable of the customer data analysis already provides a possibility for the reallocation of vehicle volumes for the individual markets and thus an optimization possibility for the sales control. On the individual customer level, the implementation of the discount control developed here is questionable for several reasons. On the one hand, the data protection situation is unclear, since according to the current status, no customer data at the retail level may be passed on to the headquarters. This hurdle could be avoided by developing a tool that the retailer could use voluntarily. On the other hand, customer acceptance is questionable. Individual price control would mean that customers would receive different prices for the same vehicles.

In terms of transparency, this is certainly not desirable for customers. On the other hand, dynamic pricing procedures have long been established in the economy, so that no major customer fears are to be expected here either. The lack of transparency in price control can be compensated by the targeted discounts determined by customer data analysis. The individual premiums could continue to be a component of the tool to be developed, so that an overall flow of information up to the touchpoint with the customer can be achieved. Overall, with the model for customer-specific price control, a first approach on the way to individual dynamic pricing, which is successfully applied in the aviation industry, can be achieved. However, the customer lifetime value, which is not included in the developed model, is not considered. If this integration takes place, the holistic view of a customer and his individual data can lead to an efficient price control. On the basis of the analyses carried out, however, a clear potential for

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profit increase can also be revealed at the retail level through customer-specific price control. Furthermore, the analysis results also lead to efficient resource planning for the sales partners here and the customer experience can be increased by offering customer-specific premiums, which are determined by the customer data analysis. In summary, the analysis of the two models for price control at the various sales levels shows a number of potentials, which is why the integration of customer data as control parameters can be recommended. Thus, the analysis continues to provide an answer to the second research question within the scope of this work. With the reference models it could be proven that customer data has a positive influence on price control.

Finally, an approach to the possibility of generalizing the models was developed within the framework of this work. In summary it can be said that due to the common basis of the models, the scoring procedure of the customer data, a generalization is possible as soon as the decision variables of the scoring procedure are changed. This means that if further vehicles or their potential customers are to be analyzed using the developed models, only the decision parameters have to be changed at the beginning of the algorithm-based analysis and all analyses aim at the desired vehicle. Not only further electric vehicles can be investigated, but also the transferability to other drive concepts is theoretically given, but a fundamental revision of the segmentation logic would be necessary.

9.2 Limitation

Based on the analyses of this work and the discussion of the results in the above chapter, some relevant limitations can be found for this work. In the following, therefore, all limitations concerning the results of this work are compiled.

From the literature, as well as from best practice approaches of other branches of industry, it becomes clear that the digitization of marketing and sales offers clear potentials for companies. Digital products and the digital sales funnel, which offer special optimization potentials with regard to data-driven decisions for companies, are examined in detail. In the literature, however, there is a lack of concrete recommendations for action for the automotive industry, especially with regard to the challenges in the field of electromobility. For this reason, the present thesis and the data from Mercedes-Benz EQ have been used to develop approaches that contribute to research in the field of digitization of the automotive industry.

First, it can be generally stated that the procedure developed for customer data analysis forms the basis for all further models. There is therefore a high dependency on the results of the customer data analysis. Although data from Mercedes-Benz CRM systems as well as data from Mercedes-Benz EQ's online registration were available as part of this work, it was not possible to link these data, which is the first limitation of this work. Furthermore, the decision variables of the algorithms for customer data analysis and subsequent segmentation are based on the one hand on the literature and on the other hand on practical assumptions. Both forms of decision variables were not sufficiently validated, so that the scoring value determined for the customer

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cannot easily be evaluated as a purchase probability, which is a further limitation of this work. Overall, this is also due to the fact that no vehicle has yet been sold for validation. Data-based conclusions are only possible after the official sales launch, so that the approaches and models developed here can be regarded as preparatory measures for the market launch of the electric vehicle. It must also be explained that the segmentation of customers is only carried out in three segments. Due to the rather superficial decision factors of the algorithms, which in turn is due to the insufficient validation of the decision factors, the algorithms initially serve to reduce the complexity of the market conditions. Since it is not yet possible to draw conclusions about the real customers who buy a vehicle, segmentation can, however, lead to data-based and more efficient market cultivation. However, this is another limitation of this work. Although customer data is available for analysis, there are limitations due to data protection aspects that currently restrict a continuous flow of information across all levels within the existing sales structure, which represents a further limitation in the context of the data protection of this work.

The issue of data protection also represents a limitation for the other models developed within the framework of this work. For this reason, only one model could be developed for measuring conversion rates, which could only be validated on the basis of assumptions due to data protection restrictions. It can therefore be stated that the model for optimising digital sales funnel and for deriving data-driven investment decisions is based on assumptions that have to be verified in the complex practical environment. It is therefore questionable whether the recommendations for action to be derived also lead to the desired optimizations in practice. Furthermore, the developed model is customer-centric, other areas within a company with the exception of marketing, sales and controlling were not considered. Nevertheless, the developed layer model provides an optimization approach for the data-based orientation of the sales funnel and thus for the digitization of marketing and sales.

In the seventh chapter, models were developed for price control at different sales levels that allow data-based price control and can thus be called the first step towards dynamic pricing. The focus was exclusively on the decision variable of the customer data and its effect was analyzed and validated. The interaction with the other decision parameters was not taken into account. The fact that only the variables of the customer data are considered therefore represents a further limitation of this work. In a global competitive environment, it must also be taken into account that different markets and regions are used for the analysis. In the context of this work, only data from European countries were considered. An analysis of further markets was not carried out due to limited data availability, so that, for example, American and Chinese markets, in which electric mobility also plays a major role and whose customers have different characteristics, were not included in the model developed. In any case, it is therefore advisable to extend the analysis with the help of global data. Furthermore, the assumptions of the developed models must be checked with regard to the control variable of the decision variable and the interval determination for price control on the basis of practical data. If one compares the approaches developed in the automotive industry with already existing airline industry solutions, it should also be noted that the factor of the customer lifetime value was not taken into account, but this is an important control parameter with regard to the purchase price of a product in the customer lifecycle.

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Overall, the present work can be further limited by the fact that the analysis and development of models are based exclusively on data from Mercedes-Benz EQ. In order to ensure general applicability and transferability, a generalization approach has been developed, the effect of which cannot yet be confirmed. A general transferability, however, is given due to the definition of control parameters, which depend directly on the results of the customer segmentation. After successful data-based customer segmentation, all models can be applied and data-based recommendations for action derived. These supports both the holistic optimization of the digital sales funnel and price control at the various sales levels and in online direct sales. Using the developed decision variables, the approaches to price control can be used both for determining the total price and for calculating leasing rates.

Finally, it can be stated that the considerations of this work relate to the use in the field of electromobility. Although the generalization approach also provides theoretical transferability, this requires a thorough revision of decision variables within customer segmentation. It is therefore recommended to conduct further research and analyses within the framework of the automotive industry to further validate the concepts of this thesis.

9.3 Outlook and Further Research Needs

The approaches and models developed within the scope of this work serve as a basis for the digitization of marketing and sales within the automotive industry. As essential implementation means the control of the digital sales funnel and the analysis of customer data can be mentioned. Since the results of this work provide the basis for further development, the following section provides an outlook on further possibilities and the research required for this.

First of all, it should be noted that the algorithms developed for customer data analysis and segmentation have already been prepared in such a way that the use of machine learning provides further insights and optimization potential. As soon as conclusions can be drawn about the customers who have actually bought a vehicle, the use of machine learning not only helps to identify the right customers, but also to filter out the essential decision parameters and, if necessary, to find further decision parameters. In order to identify the right customers, there is also a need for further research into the validation of decision variables.

In addition, an optimization is achieved as soon as the online and offline data can be linked with each other and an exchange of information about the individual customer across all sales levels can be ensured. From the point of view of data protection law, the development of a legally compliant data processing approval by the customers will help the company to achieve integrated data transfer and data processing. But even if the legal restrictions have been met, a concept must still be developed that ensures data linking and data provision in a global context and across all sales levels.

With the development of a holistic data processing consent and the consent of the customer, the tracking of the customer through the digital sales funnel is also made possible. The models

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developed within the scope of this work can thus be examined and a holistic control of the digital sales funnel made possible. From the company's point of view, this means that the individual customer journey of each customer can be known and thus an even better knowledge of the customer can be generated. However, further research is needed to validate these possibilities. The same applies if the digital products are not only used from information media that efficiently guide the customer through the sales funnel to the point of purchase, but the digital products are also used for direct monetization. Concepts and offers for direct monetization can, for example, be implemented using next best actions via the mobile application. The form and strategic orientation of monetization would have to be evaluated by further investigations.

Altogether the collection of data about the individual customer also offers the possibility to create a digital twin of the customer. From the company's point of view, this digital twin could be used to optimize the communication and the optimal offering logic of products and further information and services. But also, for the customer his personal digital twin offers the possibility to find out which possibilities he still has in the digital ecosystem. At the same time, the digital twin could provide a link to the scoring process. Today the score is calculated statically, so the customer has no possibility to improve his individual score. Even from the company's point of view it is not possible to determine whether the customer has made a development, for example through test drives or attending events, and whether this increases the probability of buying. The digital twin would capture this data, offering a dynamic scoring possibility and thus an advantage for customers and companies. So far, the concepts of the digital twin are only known from the technical field, so that there is a need for further research in the evaluation of the concept of the digital twin and its application in the marketing and sales environment.

A digital twin would also bring advantages for price control at the individual customer level, since the digital twin means transparency about the customer for the company by means of targeted and customer-specific offers similar to the premiums presented. But even without the digital twin, the use of machine learning offers potential for optimizing price control, especially with regard to online direct sales opportunities, which will also be used in the automotive industry in the coming years. The approaches developed in the context of this work show that customer data from the company perspective have a positive influence on price control and thus profit potentials are made possible. However, there is still a need for further research to put this into practice. So far, static calculations have tended to lead to data-based price control. It must be checked whether the decision variables or the assumptions that lead to profitability also apply in practice. At the same time, other variables such as the customer lifetime value can be included in price control. After successful validation of the approaches by further studies, the companies are given an instrument by means of which they operate an optimized price control on the basis of their customer data, thus avoiding unnecessary discounts, experiencing an increase in efficiency in the area of marketing and sales and ultimately becoming more profitable and thus asserting their position in the digital competitive environment.

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Since this work is essentially based on the data from Mercedes-Benz EQ and the sales control of the EQC, there is a need for further research into the possibility of generalization and thus transferability to other applications. A transferability within Mercedes-Benz EQ is possible due to the database in the field of electromobility. In order to generalize the concept and apply it to other data sources in other companies, it is recommended that further studies be carried out in this environment as well.

Overall, this work provides the basis for the data-driven optimization of marketing and sales, initially in the context of electromobility, for the automotive industry and thus continues to create the basis for the digital orientation of car manufacturers in order to survive in a strong competitive environment and to meet future challenges.