Driving the future: The strategic reinvention of the DTM Group amidst market changes in the automotive industry. From core rigidities to dynamic capabilities.

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Abstract

This dissertation examines the strategic adaptation and market evolution of the DTM Group, a leading drivetrain manufacturer, amidst the dynamic changes and crises they experienced in the automotive industry. Initially, DTM exhibited core rigidities as it struggled to transition from its reliance on internal combustion engine components to embrace electric vehicle technology. These rigidities hindered the company's ability to pivot and adapt to rapidly changing market demands. It was only when the market changes severely impacted DTM's profitability that the company recognised the need for strategic reinvention. Using a comprehensive case study approach, this research examines DTM's strategic initiatives such as engineering transformation, cost reduction through outsourcing, strategic localisation and customer base diversification. The findings reveal how DTM has successfully leveraged its dynamic capabilities to innovate and remain competitive during market disruption. Key challenges and constraints are discussed, highlighting the need for continuous adaptation in the face of technological advances and market shifts. By transforming its rigid structures into dynamic capabilities, DTM has not only survived but also positioned itself as a forward-looking player in the EV market. The study provides valuable insights for strategic management in rapidly evolving industries, highlighting the critical role of dynamic capabilities in overcoming core rigidities and sustaining competitive advantage.

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Resumo

Esta dissertação examina a adaptação estratégica e a evolução do mercado do Grupo DTM, um dos principais fabricantes de sistemas de transmissão, no meio das mudanças dinâmicas e das crises que se verificaram na indústria automóvel. Inicialmente, DTM apresentava uma rigidez central à medida que se debatia com a transição da sua dependência dos componentes do motor de combustão interna para adotar a tecnologia dos veículos eléctricos. Esta rigidez prejudicou a capacidade da empresa de se adaptar às exigências do mercado em rápida mutação. Foi apenas quando as mudanças no mercado afectaram gravemente a rentabilidade da DTM que a empresa reconheceu a necessidade de reinvenção estratégica. Utilizando uma abordagem de estudo de caso abrangente, esta investigação examina as iniciativas estratégicas da DTM, tais como a transformação da engenharia, redução de custos através da externalização, localização estratégica e diversificação da base de clientes. Os resultados revelam a forma como DTM conseguiu tirar partido das suas capacidades dinâmicas para inovar e manter-se competitiva durante as perturbações do mercado. São discutidos os principais desafios e condicionalismos, salientando a necessidade de adaptação contínua face aos avanços tecnológicos e às mudanças do mercado. Ao transformar as suas estruturas rígidas em capacidades dinâmicas, DTM não só sobreviveu, como também se posicionou como um interveniente virado para o futuro no mercado dos veículos eléctricos. O estudo fornece informações valiosas para a gestão estratégica em sectores em rápida evolução, salientando o papel crítico das capacidades dinâmicas na superação da rigidez do núcleo e na manutenção da vantagem competitiva.

Título: Conduzir o futuro: A reinvenção estratégica do Grupo DTM face às mudanças do mercado na indústria automóvel. Da rigidez do núcleo às capacidades dinâmicas.

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Palavras-chave: Adaptação Estratégica, Evolução do Mercado, Fabricante de Trens de Força, Veículos Elétricos, Capacidades Dinâmicas, Indústria Automotiva, Inovação, Redução de Custos, Localização, Diversificação de Clientes

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List of Abbreviations

Abbreviation	Definition
APAC	Asia Pacific
CAGR	Compound Annual Growth Rate
DTM	Drive Train Manufacturer
EV	Electric Vehicle
HEV	Hybrid Electric Vehicle
ICE	Internal Combustion Engine
KPI	Key Performance Indicator
NVH	Noise, Vibration and Harshness
OEM	Original Equipment Manufacturer
PESTEL	Political, Economic, Social, Technological, Environmental, Legal (framework for analysis)
R&D	Research and Development
SWOT	Strengths, Weaknesses, Opportunities, Threats (framework for analysis)
TCO	Total Cost of Ownership

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1. Introduction

For over a century, the roar of the internal combustion engine has been the heartbeat of the automotive industry. Companies like the DTM Group[1] thrived by perfecting the design, engineering and manufacturing of drivetrain components - that transmit engine power to the wheels (Stark, 2024)- securing their place as indispensable suppliers to the automotive giants. However, the dawn of the 21st century has brought unprecedented challenges and changes that have begun to disrupt this long-standing equilibrium.

This thesis explores the strategic evolution of DTM Group, a leading manufacturer of propeller and half shafts, to address the transformative forces reshaping the automotive landscape. DTM's story is one of resilience and reinvention. From its roots as a leading supplier of drivetrain components for traditional internal combustion engine (ICE) vehicles to its current struggle and strategic pivots in response to the wave of electrification, DTM's journey reflects the wider industry's oscillation between stability and change.

By examining DTM's strategic responses through a comprehensive case study approach, this thesis aims to illuminate the adaptations, market foresight and strategic innovations that have enabled DTM to navigate its most challenging period to date. The study provides valuable insights into the dynamic capabilities and strategic agility required to thrive amidst the technological advances and environmental imperatives driving the shift to electric vehicles (EVs).

Divided into several key sections, the thesis begins with a detailed overview of the methodology employed, followed by a theoretical foundation that includes core concepts and frameworks essential to the analysis of strategic adaptation. The core of the thesis presents a detailed case study of DTM, exploring its historical development, key strategic decisions and adaptive strategies in the face of evolving market dynamics. The pedagogical implications are then discussed, highlighting how this case can be used to teach complex strategic management concepts. The study concludes with a reflection on the wider implications for the automotive industry and the limitations of the research.

In essence, this thesis is not just a study of DTM's strategic journey but a reflection on the larger narrative of an industry at a crossroads, facing its most significant evolution since the advent of the internal combustion engine.

[1] The name of the company has been anonymised for reasons of confidentiality.

2. Methodology

This study uses a qualitative research methodology to explore how the DTM Group has strategically adapted to the reduced demand for propeller shafts caused by the rise of electric vehicles. The research design combines primary data collection through semi-structured interviews with secondary data analysis of industry reports and company documents.

Data Collection: This study used a combination of primary and secondary data collection methods.

1. **Primary Data: Semi-Structured Interviews:** Eight semi-structured interviews were conducted to gain in-depth insights into DTM's strategic adaptation. These interviews included five members of DTM's strategy team and three external industry experts. Semi-structured interviews were chosen for their flexibility, allowing for in-depth exploration of various topics while providing a structured framework to ensure that key areas were covered (Adams, 2015, p. 493).

   The interviews were designed to assess the impact and effectiveness of the strategic changes implemented by the DTM. Each interview was conducted via video call and lasted approximately 45 to 60 minutes. Questions focused on strategic decision-making processes, market foresight, adaptation measures and the outcomes of these strategies.

   Once the interview data had been compiled, key interpretations were sent back to the respondents for confirmation. This process ensured the accuracy of the information and allowed respondents to clarify or expand on specific points.

Table 1: Anonymised Interview Overview

Interview #	Date and Time	Role of the Interviewee
1	April 12th, 2024, 16:00	Team Lead Operations Management
2	April 12th, 2024, 18:00	Team member Operations Management
3	April 16th, 2024, 10:30	Team Lead Strategy
4	April 18th, 2024, 9:00	Team member Strategy
5	April 18th, 2024, 13:30	Team member Strategy
6 (Expert)	April 19th, 2024, 9:00	University Professor: Automotive engineering
7 (Expert)	April 22nd, 2024, 9:30	Manager in specialised PE fund: Automotive suppliers
8 (Expert)	April 22nd, 2024, 13:00	Senior Manager from major client: Premium automotive

To ensure confidentiality and protect the privacy of participants, all interviews were anonymised. In addition, the identity of the company has been anonymised to avoid any potential competitive disadvantage and to minimize the digital footprint.

2. **Secondary Data: Document Analysis:** Secondary sources included industry reports, market analyses and internal company documents. These sources provided a rich context and supported the triangulation of findings from the interviews.

   Data on market trends, technological advances and competitive dynamics were obtained from reputable industry publications.

   Internal documents such as strategic plans, financial reports, consulting documents and meeting minutes provided insight into the decision-making processes within DTM. The follwing table gives a comprehensive overview of the used data sources, the amounts and the different formats.

Table 2: Overview of Data Sources

Data Source	**Amount**	**Format**
Interviews	8	DTM employees and automotive industry experts
Company Internal Documents	9	Reports, Internal Market Analysis, Operational Efficiency Reports, Meeting Minutes, Strategic Plans, Consulting Documents
Academic Articles	10	Journal Articles, Conference Papers
Industry Reports	18	Market Research Reports, Industry Analysis Reports, Government and Organization Reports, Whitepapers, Online Articles from Industry Websites
Books and Reference Material	6	Books, Book Chapters, Encyclopedic Entries, Technical Handbooks

Data Analysis: The data analysis process included several key steps to ensure the reliability and validity of the findings:

1. **Transcription and Summarisation:** Each interview was transcribed verbatim to capture detailed responses. The transcripts were then summarised to highlight key themes and insights related to DTM's strategic adaptation.
2. **Thematic analysis:** The summaries were categorised according to the questions and their themes. This categorisation facilitated a comprehensive understanding of how DTM's strategies were shaped by broader industry trends.

3. **Triangulation**: Triangulation was achieved by cross-referencing data from multiple sources - interviews, industry reports and company documents. This method helped to corroborate evidence from different angles, thereby increasing the credibility of the findings.
4. **Peer debriefing:** Drafts of the case study findings were regularly reviewed by peers and mentors. This peer debriefing process provided critical feedback and ensured that the analysis remained objective and thorough.
5. **Content validation:** Key findings were cross-checked with secondary data to validate the consistency and reliability of interpretations. This approach minimised potential bias and strengthened the overall robustness of the study.

Limitations: While the study provides valuable insights into DTM's strategic adaptation, certain limitations must be acknowledged. The use of a single organisation for the case study may limit the generalisability of the findings to the wider automotive industry. In addition, there is the potential for bias in the primary data collection process, as interview responses may reflect personal views or selective recall. To mitigate these biases, multiple data sources were used, and triangulation techniques were employed.

Overall, this methodological approach ensures a robust and nuanced understanding of the strategic dynamics at play in a rapidly evolving industry and provides valuable insights into the resilience and adaptability required to thrive in today's automotive sector.

3. Research Note

The research note includes the concepts and frameworks that students should ideally be taught before reading the case study. The concepts are essential for students to be able to answer the questions that are provided in the teaching notes. This chapter also briefly explains the differences between the three main types of engines used in a car: Internal Combustion, Electric and Hybrid. This knowledge is important for understanding the products DTM sells.

3.1. Strategic Adaption Concept

Strategic adaptation refers to the processes by which organisations adjust their strategies in response to changes in their external environment. Dynamic managerial capabilities and strategic response capabilities are essential for organisations to navigate and respond to rapid market and technological change. Adaptive capabilities enable organisations to perceive and respond effectively to opportunities and threats in their environment (Jennings, 2004). By integrating frameworks such as dynamic capabilities and the strategic fit between organisational structure and environmental demands, Andersen (2015) outlines a model of strategic adaptation that includes both centralised strategizing and

autonomous entrepreneurial behaviour. This dual approach enables organisations to remain flexible and responsive, ensuring that they continuously adjust and adapt their strategic actions to prevailing external conditions. Findings from Andersen's analysis suggest that strategic adaptation is not merely reactive but involves the proactive shaping of organisational capabilities and structures to anticipate and respond to emerging challenges. This model of strategic adaptation is critical to maintaining competitiveness and achieving sustainable organisational success in dynamically changing industries (Andersen, 2015).

3.2. Core Capabilities and Core Rigidities

Leonard-Barton (1992) identifies core capabilities as clusters of skills, technical systems, management systems and values that are deeply embedded in the firm. These capabilities are sources of competitive advantage that enable firms to achieve superior levels of performance in product development and delivery. However, Leonard-Barton also introduces the concept of core rigidities - the flip side of core capabilities - which highlights how these same strengths can become weaknesses. Core rigidities occur when the capabilities that once provided competitive advantage become barriers to change, particularly when the external environment changes dramatically. It is important for companies operating in rapidly evolving industries, to continually assess whether their core capabilities are becoming rigid and inhibiting adaptation and transformation. This means maintaining a balance between leveraging existing strengths and avoiding the inertia that can result from over-reliance on past success (Leonard, 1992).

3.2.1. Dynamic Capabilities

Building on the understanding of core capabilities and rigidities, the concept of dynamic capabilities, comes into play. Dynamic capabilities are a critical framework in strategic management, originally detailed by Teece, Pisano and Shuen (1997), that emphasises an organisation's ability to integrate, build and reconfigure internal and external capabilities to cope with rapidly changing environments. Teece's framework of dynamic capabilities highlights the importance of firm agility for business success. It outlines three critical capabilities:

- (1) the ability to sense and influence opportunities and threats,
- (2) the ability to seize opportunities, and
- (3) the ability to sustain competitiveness by improving, integrating, securing and, if necessary, transforming the firm's intangible and tangible assets (Teece et al., 1997).

Ilan Barreto (2010) extends the concept of dynamic capabilities by focusing on their strategic implications. He describes dynamic capabilities as the firm's potential to solve problems systematically through organised and purposeful processes. These capabilities are not just about adaptation, but fundamentally about creating new forms of competitive advantage over time, particularly through the identification, exploitation and transformation of opportunities. Understanding the interplay between

core capabilities, core rigidities and dynamic capabilities is crucial for firms, especially those operating in rapidly evolving industries. By harnessing dynamic capabilities, firms can transform core rigidities into strengths and ensure that they remain relevant and competitive (Barreto, 2010).

3.3. SWOT

The SWOT analysis framework "is one of the oldest and most widely adopted strategy tools worldwide" (Puyt et al., 2023). It is a cornerstone of strategic planning, providing organisations with a clear and systematic approach to assessing their competitive position. By breaking down internal and external factors into four quadrants - strengths, weaknesses, opportunities, and threats - organisations can gain a comprehensive view of their current situation and make informed decisions about future strategies. Strengths and weaknesses, categorised as internal factors, are attributes that an organisation can influence. Strengths are the unique resources, capabilities, or positions that an organisation can use to its advantage. Weaknesses, on the other hand, are internal elements that can detract from an organisation's value proposition or hinder its ability to achieve its goals. Opportunities and threats are external factors that reflect the landscape in which an organisation operates. Opportunities represent potential avenues for growth or improvement. Conversely, threats are external challenges that may pose risks to the organisation's performance (Gurl, 2017).

It is important that the SWOT analysis is not seen as a one-off activity, but as an ongoing process that forms a core part of strategic management. This continuous process involves monitoring the business environment to gather timely information for accurate decision making (Pickton & Wright, 1998, p. 102).

3.4. PESTEL Analysis

In order to create a competitive advantage, the top management of organisations must scan the environmental factors very carefully. Without an environmental scanning process, the organisation may be considered blind and deaf in an ecosystem that will definitely end in the cessation of activities (Akbalik & Çitilci, 2019, p. 336).

Macro environmental analysis involves reviewing the external environment to identify trends or changes that could affect an organisation's strategies, presenting both threats and opportunities. The PESTEL framework assesses these factors - political, economic, social, technological, environmental, and legal - to determine how external changes might affect business strategies and operations. PESTEL analysis provides a thorough understanding of the macro-environmental factors that could affect decision-making processes. It helps organisations anticipate challenges and opportunities, thereby increasing the resilience and adaptability of strategies. In addition, PESTEL provides managers with the necessary insights to manage the complexities of their external business environment proactively

rather than reactively. This analysis is critical to identifying potential risks and seizing opportunities in a dynamic business context (Rahman & Mishra, 2023).

3.5. Engine Types

A clear understanding of the different types of engines available in cars is needed to understand the market transition. The three main categories are the internal combustion engine (ICE), the hybrid engine and the electric engine. Each represents a different phase in automotive technology and market preference.

3.5.1. Internal Combustion Cngine (ICE) Vehicles

A car with an internal combustion engine works by converting the energy from the fuel into mechanical power that moves the car. At the heart of the car is the engine, which burns fuel to create small explosions. These explosions create motion in parts of the engine, which is then converted into rotational power. This power is managed and adjusted by the transmission, which acts like a gearbox, selecting the appropriate amount of power needed based on driving conditions, such as speed or climbing a hill. From the transmission, the power must be transferred to the wheels to make the car move (Ferrari et al., 2022, p. 3). This is where prop shafts and half shafts come into play. In rear-wheel drive or four-wheel drive cars, a long rod called a propeller shaft runs from the gearbox at the front or center of the car to the rear axle. It transmits power to the rear wheels. In front-wheel drive cars, however, this task is performed by half shafts. These are shorter and connect directly from the gearbox to each of the front wheels. Half shafts are unique because they need to be flexible to allow the wheels to move up and down with the car's suspension and to steer left or right (Rajput, 2008, pp. 505–509).

So, the engine provides the raw power, the transmission fine-tunes it, and the prop shafts or half shafts transmit that power to the wheels, allowing the car to move smoothly on the road. This basic concept applied to almost all cars in the world for decades.

3.5.2. Electric Vehicles (EV)

However, starting in the early and mid 2010s, electric vehicles (EVs) suddenly penetrated the market, as they became more and more suitable and accessible for the masses. EVs are distinctly different to ICEs, not only from the sort of power they use, but most importantly for an engineering viewpoint. EVs use electric motors that draw power from batteries, eliminating the need for traditional multi-speed gearboxes due to the motors' ability to operate efficiently across a wide range of speeds. This leads to a simplified drivetrain with fewer moving parts. EVs often use a single-speed transmission and may have wheel-mounted motors, which neglect the need for long prop shafts. In vehicles where the motors are

not wheel-mounted, short half shafts are used to transfer power from the motor to the wheels (Bansal, 2005, p. 57).

3.5.3. Hybrid Electric Vehicles (HEV)

In parallel, Hybrid Electric Vehicles (HEVs) bridge the gap between ICE and EV. These vehicles use both an internal combustion engine and electric motors powered by on-board batteries. Unlike EVs, Hybrids do not require an external power source for charging; instead, they recharge their batteries through regenerative braking and engine operation (Larminie & Lowry, 2012, pp. 19–21). This dual-system approach enables improved fuel efficiency and reduced emissions without sacrificing performance, further diversifying the automotive landscape (Sher et al., 2021, p. 1).

4. Case Study

4.1. Introduction

The car manufacturing industry stands as a colossal pillar of the global economy, boasting an impressive annual revenue exceeding $2.5 trillion. With over 61 million vehicles sold across the globe in 2023, it dwarfs the aviation industry by more than threefold in size (Carlier, 2023). This staggering output not only demonstrates the efficiency of the industry, but also highlights its central role in modern economies. But beneath the surface of this monumental industry lies a complex network of specialised component manufacturers, each contributing to the seamless operation of the automotive giants. In the midst of famous brands such as Mercedes and BMW, component suppliers such as the DTM Group play a vital but often overlooked role. DTM, a leading manufacturer of drivetrain components, has a rich history intertwined with the evolution of the automotive industry. For decades, DTM has thrived by mastering the production of propeller shafts - components integral to the performance of internal combustion engine (ICE) vehicles, securing its place as an essential partner to major car manufacturers. DTM's journey is a testament to its innovative spirit and engineering prowess, which has enabled it to forge strong partnerships with major car manufacturers and dominate its niche market. But the advent of electric vehicles (EVs) marked a turning point. The very landscape that had allowed DTM to flourish began to shift beneath its feet. The transition from ICE to EVs presented unprecedented challenges, forcing DTM to reassess and reinvent its strategic approach. This case study explores the strategic crossroads DTM faced, highlighting the hurdles and opportunities that come with navigating such transformative industry changes. Through a detailed examination of DTM's strategic shifts, this narrative reveals the complexities of adapting to a rapidly evolving market. It demonstrates the company's resilience and the strategic choices that have defined its path through an era of significant technological disruption. By exploring DTM's experience, this case study offers a window into the wider dynamics of the automotive industry's evolution and the relentless drive to innovate and adapt in the face of profound change.

4.2. DTM Group

The DTM Group has an impressive annual turnover of €520 million (2020) and employs nearly 2,200 people. As the market leader in propeller shafts - commonly referred to as driveshafts and prop shafts - DTM plays a vital role in the automotive industry. These components are essential for rear-wheel and four-wheel drive vehicles, transmitting rotational power from the engine and transmission to the rear axle to enable vehicle mobility (Hilgers & Achenbach, 2021, p. 39). In 2020, Europe accounted for the largest share of sales at approximately 62%, followed by North America at 30% and APAC at approximately 8%. Headquartered in Germany, DTM has a global presence with sales, engineering and manufacturing facilities in Germany, USA, China and Poland. Its customers include leading

manufacturers of all-wheel and rear-wheel drive vehicles, particularly in the premium segment (DTM, 2023).

4.2.1. History

DTM has been developing and producing propeller shafts in Germany for 60 years. However, the tradition of the company goes back more than 200 years. The company specialised in the production of drive shafts for vehicles in East Germany. Following German reunification in 1990, the company was released from state ownership and privatised in 1992 by Heinrich von Nathusius, a descendant of the founder. Under his leadership, DTM modernised its production facilities and expanded its product range, securing significant orders from major car manufacturers such as Daimler, VW, Ford, General Motors and BMW. In the decades that followed, DTM established itself as a major player in the global automotive supply chain, expanding into North America and further enhancing its manufacturing capabilities.

4.2.2. Business Segment and Competitors

DTM operates in the automotive component manufacturing sector, specialising in the design, manufacture and sale of driveline technology. Its core products include propeller shafts, half shafts and joints. These components are critical to the functionality of vehicles, with propeller shafts playing a key role in internal combustion vehicles and half shafts being essential for all types of vehicles, including ICEs, EVs and hybrids.

Understanding the competitive landscape is critical to understanding DTM's strategic positioning. The company faces competition from several key players, each with a different strategy:

- **GKN**: GKN is the one of the biggest companies in the drivetrain sector, with 46 global manufacturing sites and over 25.000 employees (GKN, 2023). The company has a stronghold in half shaft innovation, which contrasts with DTM's high-cost production strategy, highlighting the competitive pressures DTM faces.
- **Neapco**: Neapco was founded in 1921 in the US and has 11 global locations and 3.200 employees (Neapco, 2019). Neapco's aggressive pricing strategy, backed by substantial investment from its Chinese parent company, represents a significant challenge to DTM's traditional premium market approach.
- **AAM:** AAM is a leading global automotive supplier with over 80 facilities in 18 countries (AAM, 2023). Although strong in North America, AAM has suffered setbacks, losing contracts and showing a reluctance to invest in drivetrain technologies.

- **Nexteer**: Nexteer Group has 13.000 employees located at 27 different locations (Nexteer, 2023). Focused on the emerging EV market, Nexteer benefits from low-cost Chinese sourcing. However, its presence in Europe's premium segment remains modest compared to DTM's established dominance.

DTM's commitment to high quality, localised production has fostered strong relationships with premium OEMs, but adapting to cost pressures and technological change is critical to future success. This strategic positioning helps DTM navigate the complexities of maintaining market leadership amidst evolving industry dynamics.

4.3. The Golden Era of ICE Vehicles

With the foundations laid through strategic leadership and expansion, DTM entered what can aptly be described as its "Golden Era". This period was marked by unprecedented growth and stability as the Internal Combustion Engine (ICE) remained the dominant technology in the automotive industry. DTM's expertise in propeller shaft manufacturing became the cornerstone of its success, taking the company to new heights. During this period, DTM thrived, unchallenged by the nascent electric vehicle (EV) movement, which had yet to significantly disrupt the market.

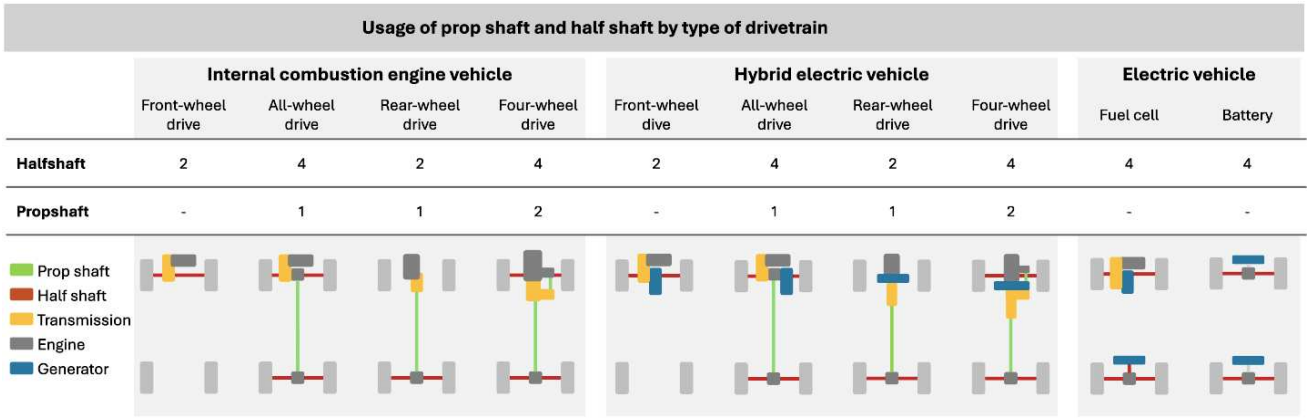
4.3.1. Product Importance

It is important to understand the importance of DTM's products during this golden era. Propeller shafts were essential components for almost every rear-wheel and four-wheel drive vehicle on the road, transmitting power from the engine to the wheels. This ubiquity meant that DTM's high quality prop shafts were in constant demand, fueling the company's growth. In 2020, propeller shafts accounted for 79% of DTM's sales, underlining their importance to the company's business model.

In addition, DTM's half shafts played a vital role in all types of vehicles, including ICE, hybrid and later electric vehicles. In 2020, the half shaft accounted for 14% of DTM´s sales. The other 7% of DTM´s sales come from selling joints, that are used to connect the shafts to other parts of the car.

The figure below gives an overview of how the individual parts are installed in the respective car type depending on the type of drivetrain. Prop shaft (green) and half shaft (red) are the components that are produced and sold by DTM.

Figure 1: Differences of drivetrains and its components (own figure)



4.3.2. Customer Relationships

DTM's success during the Golden Era was underpinned by its strong relationships with leading car manufacturers. Companies such as Daimler, Volkswagen, Ford, General Motors and BMW relied heavily on DTM components. These partnerships were not just business transactions, but strategic alliances that fostered long-term stability and mutual growth.

Daimler stands out as DTM's largest customer, accounting for 46% of sales, or 244 million euros. The partnership between DTM and Daimler began in 1992, a key year for both companies. By 2020, DTM's share of wallet for all drive shafts used at Daimler was 73%, underlining the deep integration of DTM's products into Daimler's vehicle range. One of the milestones in this partnership was the award of a contract to supply drive shafts for Daimler's entire S-Class, E-Class and C-Class range. This contract, worth over €150 million annually, was a testament to DTM's reliability and quality. Daimler's decision to trust DTM with such a critical component for its high performance SUVs underlined DTM's reputation as a key supplier, ensuring that Daimler's vehicles maintain their renowned driving dynamics and reliability.

Volkswagen, which accounts for 18% of DTM's sales (€91 million), illustrates a business relationship strongly focused on drive shafts. Like the partnership with Daimler, the relationship with Volkswagen began in 1992. DTM supplies all major VW Group platforms, a clear indication of the confidence VW has in DTM's capabilities. In 2005, DTM extended its collaboration with Volkswagen by signing a long-term agreement to supply prop shafts for VW's new range of premium sedans and SUVs. This contract, worth €40 million per year, significantly strengthened DTM's position in the European market. The collaboration included joint development projects where DTM engineers worked closely with VW design teams to optimise component performance and integration. This synergy resulted in vehicles that were not only more powerful, but also more efficient and reliable.

While Daimler and Volkswagen were key partners, DTM also had strong relationships with other major car manufacturers: DTM's partnership with Ford involved the supply of advanced drive shafts for their performance trucks and SUVs. The relationship was marked by the successful launch of the Ford F-Series, where DTM's components played a key role in improving vehicle performance and reliability.

DTM's collaboration with GM has included the supply of high durability drive shafts for GM's range of heavy-duty trucks. Local production capabilities at DTM's South Carolina facility enabled the company to meet GM's stringent delivery schedules and quality requirements, reinforcing the strategic importance of local manufacturing.

DTM's innovation in lightweight propeller shafts found a key partner in BMW. The introduction of advanced composite materials in propshafts, which reduced weight and improved fuel efficiency, was a milestone in the partnership. BMW integrated these components into their high performance and luxury models, demonstrating the critical role of DTM's engineering capabilities.

4.3.1. Manufacturing Sites

DTM's manufacturing facilities were the backbone of its operational success during the Golden Era. The plant in Germany, with its high level of vertical integration, was the jewel in DTM's crown. Not only did it account for 47% of the company's sales in FY20, but it also set the standard for quality and efficiency in production. Specialising in propeller shaft products and joints, the German plant served as the strategic centre of DTM's production network, with the highest installed capacity. It supplied both the South Carolina and Shanghai sites with various products, underlining its key role in DTM's global operations. The success of the plant has been driven by continued investment in advanced manufacturing technologies and rigorous quality control processes. This commitment to excellence ensured that DTM's components met the highest standards and reinforced the company's reputation for reliability. One notable success was the development of an innovative automated production line in 2008, which significantly increased production efficiency and reduced defect rates by 20%. This innovation not only increased output but also improved the quality of the propeller shafts, cementing Germany's status as a benchmark for manufacturing excellence.

In the late 2000s, DTM extended its reach by acquiring a propeller shaft manufacturing company in South Carolina, USA. This acquisition laid the foundation for serving the North American market, which accounted for approximately 30% of DTM's total sales, making South Carolina the second largest site in DTM's manufacturing network. Unlike Germany, the South Carolina site had a relatively low level of vertical integration, focusing primarily on assembly operations. Parts required for North American assembly were either supplied from the German or Polish plants or purchased locally. In addition, Germany supplied finished drive shafts, which were re-labelled and sold to local customers at

the South Carolina site. Despite the long supply chain, high transportation costs and extended lead times, South Carolina's strategic location allowed DTM to effectively penetrate the North American market. The strategic importance of the South Carolina facility was highlighted in 2010 when DTM won a major contract with General Motors (GM) to supply drive shafts for its heavy-duty trucks. This contract demonstrated South Carolina's ability to meet the stringent quality and delivery requirements of a major automotive manufacturer in North America.

The relationship between DTM and its main customer, Daimler, was further strengthened in 2017 with the strategic acquisition of Daimler's half-shaft production facilities in Poland. The site in Poland, which accounts for approximately 15% of DTM's sales, became the third largest site in terms of sales. Apart from Germany, Poland was the only other site in DTM's production network that carried out both machining and assembly activities, thus achieving a comparable level of vertical integration.

To serve the Asian market, DTM opened a facility in Shanghai in 2013. Like South Carolina, Shanghai primarily performed assembly activities for DTM's propeller shaft business, which accounted for approximately 8% of Group sales. This strategic expansion allowed DTM to tap into the rapidly growing Asian automotive market and meet the increasing demand for high quality driveline components.

4.4. The Turning Point: Navigating DTM´s Strategic Crossroads

During this golden era, DTM thrived on its strategic partnerships, manufacturing excellence and innovative solutions, securing its position as a leader in the automotive components industry. However, as the automotive landscape began to change, new challenges emerged. The rise of electric vehicles (EVs) began to reshape market dynamics, bringing with it a set of technological advances and consumer preferences that required strategic adaptation. While internal combustion engines (ICE) continued to dominate the market, the first signs of a paradigm shift were becoming increasingly apparent. Environmental regulations were tightening, consumer awareness of sustainability was growing, and major car manufacturers began to invest heavily in electric mobility. These changes heralded a new era, forcing companies like DTM to rethink their strategies and prepare for the future. This chapter demonstrates how DTM became aware that the markets were undergoing a significant transformation and that they had failed to capitalise on the potential of e-mobility, resulting in a decline in sales year on year. In 2017 DTM did not generate a profit for the first time in over two decades which was alarming for the company. But what exactly changed?

4.4.1. Meeting Subject: URGENT

There was a sense of urgency in the air in the DTM boardroom as the management team met. The heads of various departments had been called together to address a troubling realisation: the company's growth

had stalled. As the meeting began, it was clear that this was not a routine meeting, but a critical strategic crossroads.

The Chief Strategy Officer broke the ice with a stark revelation: DTM had not been aware of the market trends. The lack of accurate forecasting had led them into this situation. He stressed the need to shift their product focus to mitigate the influence of well-entrenched competitors in the half shaft sector – a product that can be found in every vehicle. The prop shaft which has a sales share of almost 80% might become obsolete to the automotive industry if the trend toward electrification continues with the same speed it currently has. "A prop shaft is not part of electric vehicles," he emphasised, underlining the urgent need for diversification.

The sales director added to the gravity of the situation by talking about customer concentration risks. Daimler, DTM's largest customer, accounted for 46% of the company's business. This over-dependence had shown its drawbacks; a shift in Daimler's requirements towards half shafts caught DTM off guard. "How can we protect ourselves from such vulnerabilities in the future?" he asked, emphasising the need for a broader customer base.

The acquisition of Daimler's half shaft manufacturing facility in 2017, which was intended to diversify DTM's product line, had brought its own challenges. The chief operating officer (COO) detailed the problems: high capital expenditure, integration difficulties and significant profitability concerns. The Polish plant was plagued by inadequate management and control systems, leading to operational inefficiencies. "We lacked transparency and visibility, which led to operational unprofessionalism," he noted.

The sales manager went on to discuss the falling demand and prices for prop shafts. Contract price reductions[2] and overall declining prices due to limited innovation were creating intense price pressure. He pointed out that DTM's production in high-cost countries made it difficult to compete with Asian manufacturers. "Price is typically the final decision criterion for any OEM," he explained, "leaving customer relationship and product quality as secondary considerations."

The CFO added concerns regarding the financial pressures: an unfavourable cost structure, insufficient focus on profitable core activities such as half shafts, and high costs due to extended supply chains and manufacturing sites only in high-cost countries. "Our pricing levels are not sufficient for sustainable profitability," he warned, underlining the need for immediate strategic changes.

Meanwhile, the market research director presented data showing high demand in the US for pickups and SUVs, which require at least one prop shaft. However, DTM's supply chain strategy had not

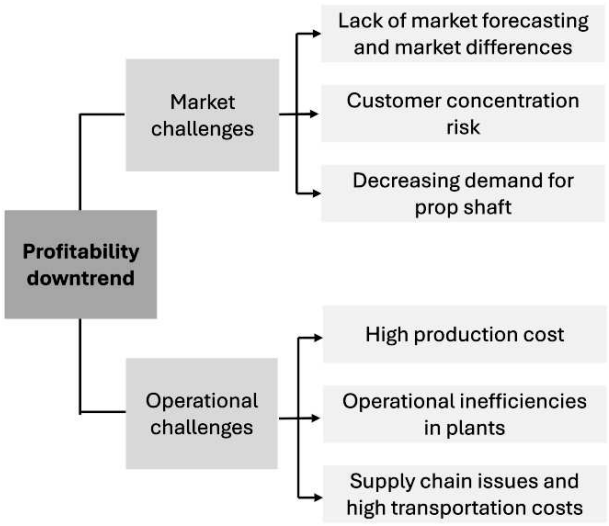
[2] DTM's contracts include pre-negotiated annual price reductions to improve cost efficiency, maintain competitiveness and strengthen long-term customer relationships, ensuring adaptability to market changes.

capitalised on these regional differences, resulting in missed growth opportunities. The US facility functioned primarily as an assembly centre with limited manufacturing, resulting in long supply chains and extended lead times. Most products were manufactured in Europe and then shipped to the South Carolina facility, which was costly. "The lack of manufacturing capacity in North America has prevented us from taking advantage of the local-for-local strategy," he said, referring to the growing trend among OEMs to source components locally.

By the time the meeting adjourned, a resounding consensus had emerged: DTM was on the cusp of a major transformation. The realisation of these multiple challenges - ranging from product portfolio issues, customer concentration risks, operational inefficiencies and financial strains - required a comprehensive strategic overhaul. The management team recognised that addressing these issues was critical for DTM to regain its competitive edge and ensure long-term sustainability. This urgent meeting set the stage for the next chapter, in which DTM would first analysis the market changes and then embark on strategic initiatives to address these challenges, adapt to the marketplace, and reposition itself.

After the meeting, the CEO sends the following diagram to everyone who attended the meeting to visualise all the different challenges that need to be addressed.

Figure 2: DTM's challenges (own figure)



4.5. Global Electrification and Regional Market Adaptations

In the wake of the urgent board meeting, the DTM initiated a comprehensive market analysis with the objective of identifying key developments that had been overlooked in the automotive sector. This chapter examines the market dynamics and the reasons behind the significant shift towards

electrification, driven by environmental imperatives, technological advances, and evolving consumer demands.

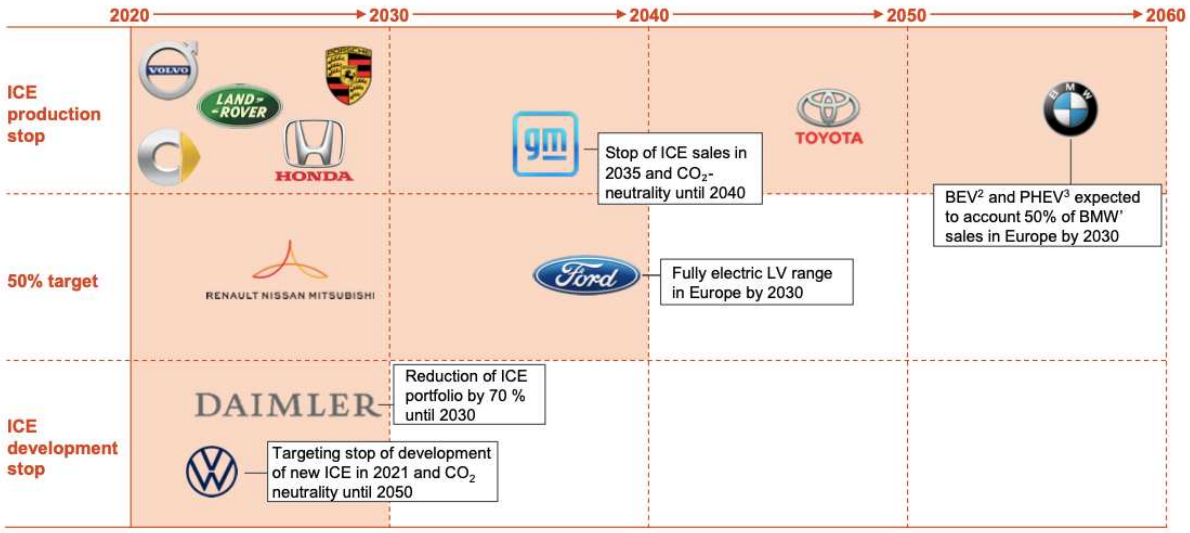
4.5.1. The Shift Towards Electrification

The shift from internal combustion engine (ICE) vehicles to electric vehicles (EVs) is being significantly influenced by global efforts to reduce CO2 emissions. Various countries have set CO2 emission targets for the automotive industry, prompting manufacturers to increase their investment in EVs to meet these stringent regulations.

With a CO2 emissions target of 95g CO2/km in 2021, expected to fall to around 60g CO2/km by 2030, Europe is leading the way in reducing CO2 emissions. The penalties for exceeding the limit are severe. As a result, the share of electric vehicles in new car fleets is projected to be over 60% by 2030 to meet the regulations (European Commission, 2024). In contrast, North America has set less stringent targets, resulting in a slower adoption rate. It is expected that the EV market share will be around 14% by 2025 (Kerry & McCarthy, 2021, p. 15). Similarly, China has set a goal of achieving CO2 neutrality by 2060, which is pushing automakers to invest in EV technologies to meet regulatory demands (Zhao, 2022). In the rest of the world the targets and penalties vary from country to country. For example, Japan has set a target of only selling electric and hybrid cars from 2035 (International Trade Administration, 2021).

All OEMs, including DTM's main customers, are currently failing to meet European CO2 emission targets (DTM analysis). Their strategies to address this range from an immediate phase-out of ICE vehicles to a more gradual approach. The following exhibit visualises the targets of different OEMs.

Figure 3: ICE exit strategies by OEM (Source: DTM, Internal Report)

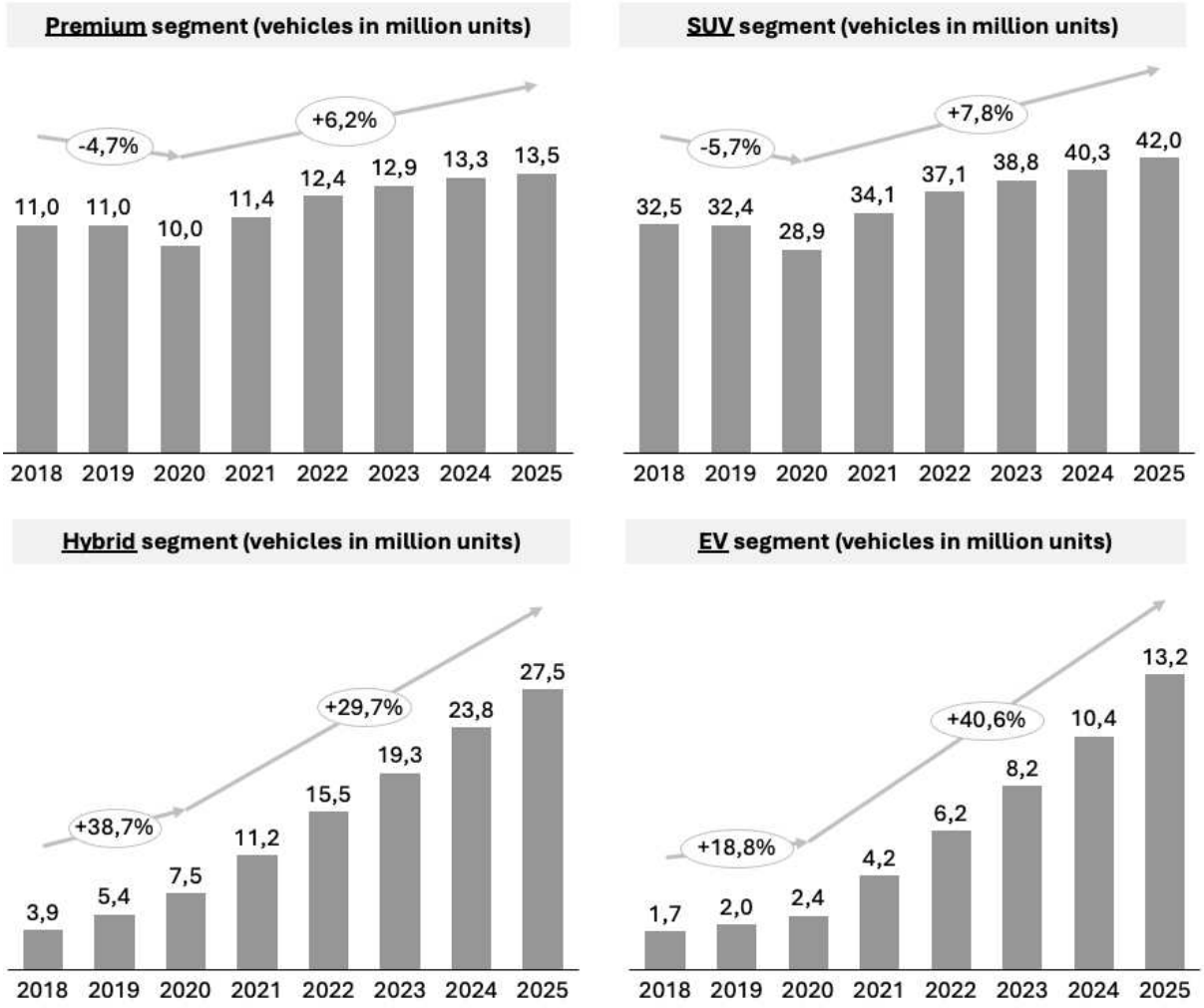


In addition, improvements in battery technology have extended the range and reduced the charging time of EVs, making them more competitive with conventional vehicles. Furthermore, EV infrastructure (charging stations) is improving rapidly, especially in Europe and China (IEA, 2023) (Cui et al., 2024, p. 3).

More and more customers are also recognizing the economic incentives that EVs can offer. To encourage the uptake of electric vehicles, various countries have introduced incentive schemes, each tailored to their specific policy objectives and economic environment. These incentives play a key role in shaping consumer preferences and accelerating the shift away from internal combustion engine (ICE) vehicles. In Germany, for example, there were extensive tax benefits and purchase incentives for electric vehicles, including a notable 'innovation bonus'. For electric cars the bonus varies from €7.500 to up to €9.000. Company cars also benefit from reduced taxation, encouraging companies to integrate electric vehicles into their fleets. The long-term cost savings on fuel and maintenance, coupled with government subsidies, make EVs economically attractive to consumers (Baik et al., 2018) (Bauer et al., 2021, p. 7).

The expansion of EVs and hybrids is even more evident when looking at the global compound annual growth rate (CAGR) of these two market segments compared to other car segments over the last years and their growth forecast for the next few years. The market for hybrid vehicles has a CAGR of almost 30% between 2020 and 2025. The electric vehicle market has a CAGR of more than 40% over the span of five years. In comparison the premium automotive market´s CAGR is only at around 6% and for SUV at around 8%. (Woodward et al., 2020) (Statista Market Insights, 2023). This goes hand in hand with the CAGR of the prop shaft and half shaft market: the CAGR of the prop shaft market has a slow rate of 3.5% worldwide (Markets and Markets, 2021). Whereas the half shaft market has a CAGR of almost 6% between 2020 and 2025 (Straits Research, 2022).

Figure 4: Global market volume and CAGR of most important car segments (own graph).



Data Source: (Hagenmeier et al., 2023)

4.5.2. Regional Market Dynamics

As DTM navigates this evolving landscape, understanding regional differences in market demand is critical:

Europe: The continent is at the forefront of electrification, driven by stringent emissions regulations and significant incentives for electric vehicles. The infrastructure for electric vehicles has developed rapidly over the last few decades, with thousands of charging points being built, making long-distance journeys possible across most of Europe. As a result, the demand for electric vehicles is growing quickly, leading DTM to increase its focus on half shafts, which are critical to electric drivetrains as the need for traditional prop shafts diminishes.

North America: In the United States, cars are often essential to daily life due to the country's vast distances and less densely populated areas compared to Europe. Americans tend to use their cars for

longer journeys, reflecting the sprawling geography of cities and less comprehensive public transport systems outside major urban centres. This results in significant demand for SUVs and pick-up trucks, which require robust prop shafts for their all-wheel and four-wheel drive systems. The slower growth of EVs in the US is due not only to less stringent regulations, but also to a lack of infrastructure for long-distance travel due to a lack of charging stations (Alanazi, 2023). However, the growing interest in EVs worldwide also means a growing market for half shafts in the United States, suggesting a two-pronged strategy for DTM in this region.

China: The market in China is rapidly adapting to electrification, supported by government policies aimed at rapidly reducing CO2 emissions (United Nations Conference on Trade and Development, 2023) (You, 2023). DTM faces the challenge of adapting its product offering to meet the surge in demand for components compatible with electric vehicles, which are predominantly half shafts.

The diversity of regional needs requires DTM to adopt a flexible and responsive strategy, balancing its product portfolio to meet changing trends. By aligning its operations and product development strategies with regional market conditions and regulatory landscapes, DTM can maintain its competitiveness and capitalise on new opportunities in both traditional and emerging automotive markets. The adaptive strategies applied by the DTM to this internal crisis caused by external demand shifts are presented in the next chapter.

4.6. Strategic Revival: Pivoting Towards Profitability

After DTM´s urgent boardroom meeting and a detailed analysis of the market, they recognize that they have to take action in order to gain back their profitability streak. This chapter explores the multi-faceted approaches DTM has adopted to not only respond to immediate industry challenges, but also to position itself for sustainable growth and success in the future. Central to this strategic shift is DTM's cultivation of dynamic capabilities, engineering competencies, close customer relationship and experiences which has enabled the company to innovate, adapt, and renew its competencies in line with the shifting tides of the market.

DTM engaged a consultancy to identify key restructuring and transformation actions. Of the many areas that were analyzed, five key areas proved to be the most beneficial to the business. The five areas include strategic engineering transformation, cost reduction through outsourcing, strategic localization and manufacturing adaption, enhancing the half shaft production and strategic customer diversification. They showed either immediate success or the most promising results for the future. Within each of these five areas, one to three specific issues were identified and matched with a solution. These are presented below:

I. Strategic Engineering Transformation

DTM undertook a significant transformation of its engineering organization, specifically targeting its approach to research and development (R&D) and global engineering capabilities.

a. To streamline operations and foster innovation, DTM restructured its R&D department:

DTM responded to the dynamic changes in the market by strategically reducing the overall headcount in the R&D department. This downsizing was aimed at reducing operational costs and facilitating more efficient communication within the team. By creating a smaller, more focused group, DTM aimed to promote a faster decision-making process and increase the agility of its R&D activities. At the same time, the company acquired nine specialized R&D experts from a leading competitor known for its half shaft innovation. This targeted recruitment not only compensated for the reduction in headcount, but also significantly increased the technical capabilities and expertise of the department. This reorganization was critical to improving efficiency and bringing fresh, competitive insights to DTM's product development processes.

b. To address the need for geographical diversification and technological advancement, DTM expanded its global engineering capabilities:

Enhanced simulation, prototyping and testing capabilities have been strategically distributed across key locations in the US, Europe and Asia. This global network expansion supports DTM's drive to develop new products, particularly for electric vehicles, including specialized components for electric motors and innovative connections from half shafts to gearboxes. By locating these capabilities in different markets, DTM gains direct insight into regional trends and consumer preferences, which is critical in tailoring its product development to meet specific market needs.

c. To enhance manufacturing efficiency and reduce costs, DTM standardized products.

Originally, DTM provided distinctive prop shafts solutions for each vehicle type and customer, thereby demonstrating its dedication to quality and robust customer relationships. Nevertheless, this bespoke approach resulted in higher production costs. To address this issue, the engineering team conducted a comprehensive analysis and identified components that could be standardised. The team discovered that a significant proportion of prop shafts could be manufactured using common components. The standardisation of components permitted DTM to streamline its production processes, reduce the complexity of its inventory, and lower the costs of its materials. This necessitated the updating of production lines and the investment in new machinery, which enhanced efficiency and reduced lead times. For example, the production of prop shafs for mid-sized SUVs and trucks saw a 15% reduction

in costs due to the use of standardised parts. The implementation of this strategy led to a reduction in delivery times and costs for customers, thereby enhancing the value proposition of DTM.

II. Cost Reduction Through Outsourcing

a. To reduce the cost of its products, DTM began to outsource the manufacture of nine small components to low-cost countries.

It is of paramount importance to manage costs effectively to achieve and maintain profitability. Cost management directly impacts margins. Historically, manufacturing in high-cost countries has presented challenges for DTM, with increased production costs resulting from higher wages. To mitigate these expenses, DTM outsourced the production of nine key propeller shaft components to China, achieving significant cost savings of €40 million. Subsequently, the components were transported to European facilities for final assembly. Considering these encouraging results, DTM has decided to extend this outsourcing strategy to other components. This will enable the company to further reduce its labour requirements and costs at its manufacturing sites. This strategic move enables DTM to maintain competitive pricing while ensuring profitability and operational efficiency.

III. Strategic Localization and Manufacturing Adaption

a. To address the challenges of extended supply chains and reliance on overseas production, DTM implemented a local-for-local manufacturing strategy:

To meet the requirements of US-based OEMs that at least 75% of components be sourced locally, DTM upgraded its South Carolina plant from an assembly-only facility to a full manufacturing site in 2022. This shift not only reduced reliance on international manufacturing hubs that were vulnerable to supply chain disruptions and currency fluctuations but also significantly shortened supply chains and lead times, ensuring better alignment with local market needs and compliance with OEM sourcing policies.

b. To enhance market responsiveness and improve cost efficiency, DTM focused on optimizing the total cost of ownership (TCO) and reducing working capital:

By establishing more local manufacturing facilities in key markets, DTM has significantly improved its responsiveness to market changes and volatility. This strategic shift allows the company to adapt more quickly to regional demand fluctuations and customer requirements. By producing goods closer to the point of consumption, DTM has effectively reduced the lead times and logistics costs associated with shipping products from distant locations. This not only reduces transport costs, which are part of the total cost of ownership (TCO) but also improves the company's ability to manage inventory more efficiently. Local production has led to a significant reduction in working capital requirements. By minimising the need to maintain high levels of inventory, DTM can operate a just-in-time inventory

system, reducing the cost of unused inventory and lowering storage costs. This approach frees up financial resources for other strategic initiatives such as R&D and market expansion. In addition, the proximity of production facilities to the market ensures that DTM can respond quickly to changes in customer demand without the risk of overproduction or stock-outs, further optimising cash flow and reducing the financial risks associated with excess inventory.

c. To address the challenges posed by varying regional market needs, DTM expanded its Shanghai facility, enabling tailored production strategies specific to the Asian market:

DTM's expansion of its Shanghai facility is another strategic decision to serve the growing Asian market and its increasing demand for half shaft products. Although currently focused on assembly, the potential to scale up manufacturing processes in this facility offers significant cost benefits and supports the wider local-for-local strategy. The company decided not to focus on the Asian market due to strong competition in the low-cost product segment. Since DTM primarily supplies components for premium vehicles, they cannot match the competitors' prices. Nevertheless, DTM needs to maintain a presence in the market and further strengthen their facility to stay up-to-date with market trends in Asia and respond accordingly.

This localization strategy has not only addressed specific operational challenges but has also enabled DTM to better tailor its products to regional market requirements. For example, the high demand for SUVs in the US and the strong push for electric vehicles (EVs) in Europe required different strategic focuses. By localizing production, DTM effectively increased its market share in North America and adapted its product strategy in Europe in line with the shift towards electrification. Through these strategic moves, DTM has not only improved its operational efficiency and market responsiveness but has also positioned itself to thrive in a rapidly evolving automotive industry and ensure it remains competitive in diverse global markets.

IV. Enhancing Half Shaft Production: Operational Efficiencies and Strategic Growth

DTM undertook a significant expansion of its half shaft production capabilities. This strategic initiative, launched at the South Carolina facility in early 2024, built on the foundational capabilities previously established in Poland and aimed to increase production volumes and drive innovation. The initial set-up of half shaft production in Poland presented numerous challenges, in particular a lack of transparency, visibility, and effective tracking of key performance indicators (KPIs). These issues led to operational inefficiencies that prolonged the ramp-up period and negatively impacted the overall efficiency of the production process. For example, the lack of detailed KPI tracking made it difficult to identify production bottlenecks in a timely manner, resulting in extended downtime and inefficient workflow management.

a. To improve operational management and tackle inefficiencies, DTM has implemented a comprehensive Key Performance Indicator (KPI) system:

Drawing valuable lessons from the Polish experience, DTM implemented a robust set of KPIs at the South Carolina plant from the outset. This move was designed to ensure a high level of operational transparency and provide management with real-time visibility into the manufacturing process. The newly introduced KPI framework covered various aspects of production, including efficiency, waste reduction, quality control and delivery times. This strategic implementation transformed the operational dynamics of the South Carolina plant. The comprehensive KPI tracking enabled the management team to closely monitor performance, quickly identify areas for improvement and efficiently implement the necessary corrective actions. This capability significantly reduced downtime, optimized production flows and improved overall product quality.

The improved operational control and detailed KPI tracking facilitated smoother integration and operational professionalism at the South Carolina facility and increased DTM's attractiveness as a partner to major OEMs. These OEMs value suppliers who can demonstrate meticulous control over their manufacturing processes and deliver consistently high quality, innovative products. The sophisticated KPI framework developed in South Carolina will serve as a blueprint for future expansion, potentially reducing the time and resources required to achieve full operational capacity at new facilities.

V. Strategic Customer Diversification

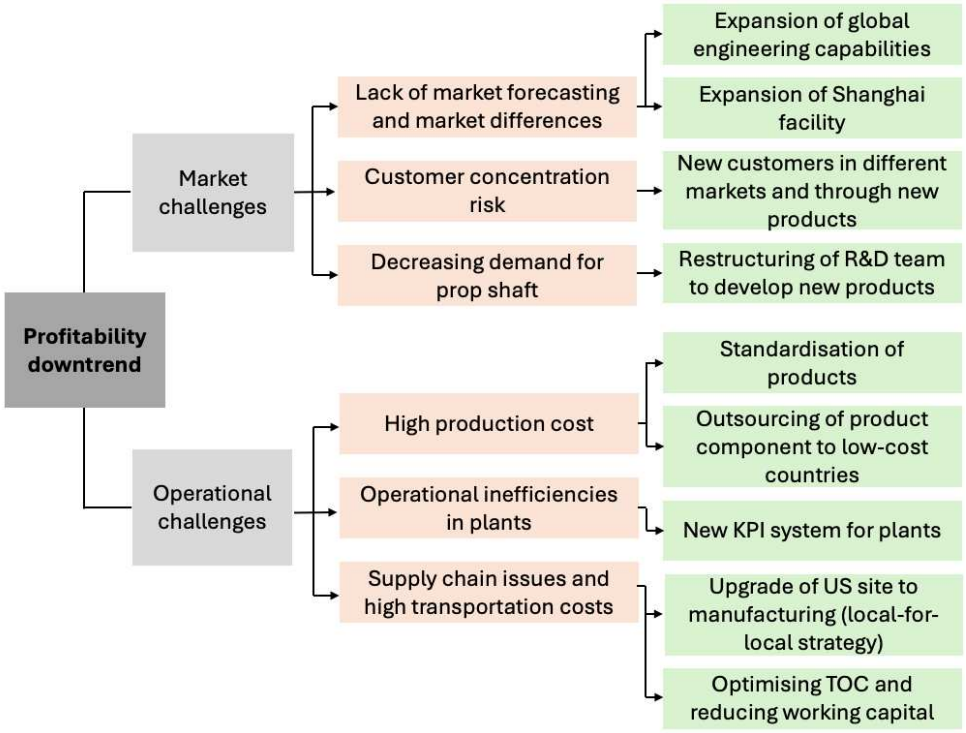
a. To mitigate the risk of over-reliance on a single large customer, DTM strategically broadened its customer base and ventured into new markets:

DTM's significant reliance on Daimler, which accounted for almost half of its revenue, exposed the company to significant risk. This over-reliance on a single customer could lead to volatility in earnings and limited bargaining power, particularly if Daimler decided to change its sourcing strategy or faced its own market challenges. To mitigate this risk, DTM has embarked on a strategic initiative to diversify its customer base beyond this single company. To broaden its market reach, DTM identified and pursued opportunities in different geographic regions and segments with less competitive pressure and high growth potential. This included targeting the North American SUV market, which not only has robust demand for larger vehicles, but also shows a growing preference for models equipped with the advanced drivetrain technologies in which DTM specializes. By aligning its product offering with market demand in the region and offering a lower price than competitors, DTM secured new business opportunities.

DTM secured new projects with Ford in North America and won a new customer for initial projects with Stellantis in the US, further diversifying its customer portfolio. DTM also extended its reach to

other major OEMs such as BMW. BMW was actively looking to reduce its in-house production of prop shafts by 50%, providing a significant opportunity for DTM to position itself as a key supplier. Working with these new partners required DTM to adapt its offering to meet the specific needs and quality standards of different manufacturers, ensuring alignment with their strategic objectives and manufacturing practices.

Figure 5: DTM´s challenges and solutions (own figure)



In summary, DTM's strategic revitalization has effectively addressed the urgent need for profitability and sustainable growth. Through a series of targeted initiatives, including engineering transformation, manufacturing localization, enhanced production capabilities and customer diversification, DTM has positioned itself to successfully navigate the complexities of the modern automotive market. These efforts have revitalized the company's operations and set a solid course for innovation and market responsiveness.

5. Teaching Notes

This chapter provides guidance for teachers and professors to explore the case study. It provides questions to stimulate discussion, suggested answers, and a flexible teaching approach. Teachers and professors should be aware of recent industry developments when facilitating the session, as these may influence the context of the case. The teaching notes are intended as a basis for teaching; classroom discourse may lead to different approaches and insights, which should be welcomed and integrated into the learning experience.

5.1. Teaching Objectives/Teaching Audience

This case study aims to provide students with the analytical tools to understand and evaluate strategic adaptations in the face of industry-wide crises and shifts. By examining DTM's response to the changing landscape of the automotive industry, students will gain insights into how companies can leverage their internal strengths and address external challenges through strategic planning. The questions provided help students to strengthen their ability to apply the principles of management theory to real world business scenarios. Students will be asked to use frameworks based on management theory in relation to the following concepts: Strategic Adaptation Concept, Core Capabilities/Rigidities, Dynamic Capabilities, SWOT, and PESTEL Analysis.

This case study is ideal for Bachelor's and master's students studying management, business, and economics. It provides valuable insights into strategic decision-making and adaptation in the automotive industry, making it a useful resource for those interested in understanding complex market dynamics and strategic management frameworks.

5.2. Teaching Approach

It is expected that the frameworks explained in the Research Note will be introduced to students in the lectures prior to the case study discussion. Students are expected to have read the case study prior to the lecture and to have written down bulleted answers to the questions to be best prepared for the class activities. The lesson follows a case study discussion approach including group work and role play. The following guide is recommended:

1. Step: Introduction (10 minutes)

The lecture should begin with a brief introduction to the DTM case study, outlining the company's historical context, current challenges, and the importance of strategic adaptation in the face of industry-wide change.

2. Step: Overview of Frameworks (10 minutes)

Even though the frameworks where already taught in previous lessons, the professor should provide a quick overview with slides highlighting the most important aspects of the relevant frameworks.

3. Group Discussions: DTM Board Meeting (30 minutes)

The students should be divided into groups of 4-5 students, with each group representing the board of DTM. Each group is given a specific set of questions about the case (A, B, C and D). The following questions are based on the frameworks studied and should help the students to better understand the

application of the frameworks in relation to a real case. The students should not only consider the information from the case but also try to think of further strategies, risks etc. that could apply to DTM.

A. **Core capabilities/Core rigidities:** Where have DTM´s strengths evolved into rigidities and how have these impacted DTM´s approach to electric vehicles? What strategies should DTM implement, and which did they already implement to address these rigidities?
B. **Dynamic capabilities:** How has DTM developed and utilized dynamic capabilities? Where has DTM effectively sensed and seized new opportunities and how has DTM transformed its resources to adapt to new market demands?
C. **SWOT:** What are DTM's core strengths and weaknesses, and how do these internal factors play into its strategy to combat or embrace the industry's move towards e-mobility? Using a SWOT analysis, propose strategic actions that DTM could take to address its identified weaknesses and threats, and to harness its strengths and opportunities.
D. **PESTEL Analysis:** What are the external factors that could influence DTM's business strategy and operations? Using PESTEL analysis, identify the key factors and suggest how DTM could effectively respond to these external pressures to increase its competitiveness in the e-mobility market.

Each student takes on the role of a board member with a different perspective (CEO, Finance, Strategy, Sales, Operations). In their groups, students should discuss their assigned questions and develop strategic recommendations from their board member's perspective.

4. Step: Case Debate (25 minutes)

The whole class should reconvene, and each group should present their board's strategic recommendations. The professor is supposed to encourage a debate format where other students can challenge the strategies presented. This encourages critical thinking and consideration of multiple strategic angles.

5. Step: Application to Current Industry Development (10 minutes)

The professor can update the class on recent developments in the automotive industry, particularly those affecting DTM or similar companies. The students are also asked to engage and think about how these new factors might affect the strategies they have developed and whether their recommendations would change in the light of this new information.

6. Step: Wrap-Up and Homework Assignment (5 minutes)

The lecture can be concluded by summarising the key points and emphasising the importance of adaptability in strategic management. As a homework assignment, students can be asked to write a

reflection paper on how they would approach being an DTM board member in the light of the discussions and recent industry developments they have learnt about. The homework can also include questions related to the concept of strategic adaptation. This can help students to demonstrate their newly acquired knowledge after the case discussion and to deepen the concept for future cases:

Strategic adaption concept questions: Why is strategic adaptation critical to DTM´s competitive advantage in the face of market and technological change? How was DTM able to recognize the need for strategic change?

5.3. Analysis and Discussion

Question A: Core capabilities/Core rigidities: Where have DTM´s strengths evolved into rigidities and how have these impacted DTM´s approach to electric vehicles? What strategies should DTM implement, and which did they already implement to address these rigidities?

Analysis of question A: The emergence of electric vehicles as a dominant market segment represents a critical external change to which DTM was initially slow to respond. This oversight is partly due to the company's entrenched success with ICE components, which likely created a sense of complacency and resistance to change. The rapid shift in the automotive industry towards electrification required a corresponding shift in component supply chains, for which DTM was not immediately prepared. This gap in strategic alignment with market evolution illustrates how core rigidities can hinder a company's ability to pivot its business model to take advantage of new technologies and market opportunities.

To mitigate these core rigidities and realign its strategic trajectory towards the burgeoning EV market, the DTM should and partly already did consider the following multi-pronged approach:

- Innovation and diversification: DTM already started to prioritize R&D into electric drivetrain components, such as electric motor housings or advanced battery systems, which are critical for EVs. This shift would not only diversify its product offering, but also reposition DTM as an innovator in the EV components market.
- Strategic alliances and partnerships: To further strengthen the R&D department to better forecast market trends, DTM should start partnering with technology companies and startups in the electric mobility space. This can bring new capabilities and insights to DTM's strategy. These collaborations could accelerate the development of new technologies and provide DTM with faster entry into emerging markets.
- Organisational and cultural transformation: Culturally, it is very important for DTM to foster an environment that encourages flexibility, continuous learning and innovation. This could include

training programmes to re-skill employees in EV technology, incentivising innovation, and integrating more adaptive strategic planning processes into the leadership framework.

- Market expansion and localisation: DTM already successfully expanded its operations into regions with a strong push towards EVs, such as Asia and parts of Europe. This already showed first improvements for DTM to tap into new customer bases and reduce reliance on traditional ICE markets. Strengthening local manufacturing capabilities in these regions will better align with local market requirements and regulatory environments.

The transition from ICE to EVs requires DTM to critically evaluate and adapt its core capabilities to overcome emerging rigidities. By strategically innovating and adapting to the new market landscape, DTM can leverage its historical strengths to secure a competitive position in the evolving automotive sector.

Question B: Dynamic capabilities: How has DTM developed and utilized dynamic capabilities? Where has DTM effectively sensed and seized new opportunities and how has DTM transformed its resources to adapt to new market demands?

Analysis of question B: The DTM has strategically developed its R&D capabilites to keep pace with advances in electric mobility. This includes redesigning internal processes, such as recruiting new staff with a very broad range of skills in the half shaft area and investing heavily in research and development focused on electric and hybrid drivetrain technologies. This approach helps DTM to anticipate market shifts and seize emerging opportunities by expanding its product lines to include essential components for electric and hybrid vehicles.

Recognising the growing demand for electric vehicles, DTM has astutely shifted its product focus to the development and manufacture of half shafts, which are critical to all types of vehicles, including electric vehicles. By recognising the ongoing demand for these components, DTM has not only maintained its relevance, but also opened up new avenues for growth in a changing industry. To adapt to new market demands, DTM has improved its manufacturing capabilities. It has implemented new manufacturing technologies that allow the versatile production of different types of drivetrain components at one site. This manufacturing expansion allows for rapid changeover between product types in response to fluctuating market demand. In addition, DTM has focused on optimising its operational efficiency, which includes refining production processes and reducing lead times to ensure that the company can respond quickly to industry trends and customer requirements.

The following table gives a comprehensive overview of how DTM´s strategic adaption highlights their dynamic capabilities in line with Barreto´s dimensions.

Table 3: Barreto´s Dimension and DTM strategic adaptions

Barreto´s Dimension	**DTM´s strategic adaption**
Ability to sense opportunities and threats	- Recognized the shift towards electric vehicles (EVs) and the decline in ICE component demand. - Anticipated the impact of environmental regulations and consumer preferences. - Undertook extensive market analysis to identify emerging trends.
Ability to seize opportunities	- Diversified customer base beyond Daimler, securing contracts with Ford and BMW. - Expanded into the North American SUV market, recognising its high growth potential. - Restructured R&D to focus on EV technologies, recruiting nine experts from competitors.
Transforming the firm´s assets	- Outsourced production of key components to lower-cost countries, saving €40 million. - Localised manufacturing in South Carolina, moving from assembly to full manufacturing to meet local demand. - Standardised components to reduce manufacturing costs and improve efficiency. - Investing in new manufacturing technologies and processes to improve product quality and reduce lead times.

DTM's proactive approach to developing its dynamic capabilities demonstrates a strategic response to the industry's transition to electric mobility. By continuously adapting its resource base and focusing on key components relevant to both ICE and EV markets, DTM remains competitive in the industry. This strategic foresight and flexibility not only secures DTM's market position, but also serves as an important lesson in the importance of agility in dynamic industries.

Question C: SWOT: What are DTM's core strengths and weaknesses, and how do these internal factors play into its strategy to combat or embrace the industry's move towards e-mobility? Using a SWOT analysis, propose strategic actions that DTM could take to address its identified weaknesses and threats, and to harness its strengths and opportunities.

Analysis of question C:

Strengths: DTM's key strengths include global leadership in prop shaft manufacturing and an emerging position in half shafts, which are critical for all types of vehicles, including electric vehicles. The company has a significant global footprint and strong relationships with premium automotive OEMs, which have been strengthened by its deep product knowledge and engineering capabilities. This positions DTM well to leverage its existing relationships and technical expertise in the transition to e-mobility.

Weaknesses: However, DTM faces challenges mainly due to its high customer concentration, particularly with Daimler, which accounted for 46% of its FY20 revenue, creating a risk of over-reliance on a single customer. In addition, its late entry into the half-shaft market puts DTM at a competitive disadvantage to well-established players. Finally, the company's significant focus on high-cost countries for production increases operating costs and limits flexibility in pricing strategies against lower-cost competitors.

Opportunities: The shift towards electrification and the growing market recovery following COVID-19 present significant opportunities for DTM. There is potential to expand the half-shaft business, with new projects such as those secured with BMW and the possibility of local manufacturing facilities in North America to improve localisation and profitability. Diversifying the product portfolio to include adjacent products and gaining a foothold in the North American pick-up segment could also serve as growth levers.

Threats: The inherent volatility of the automotive market and intense price competition, especially for commoditised components such as drive shafts, require continuous cost optimisation to maintain profitability. The lack of a manufacturing presence in the large and growing Chinese market and the increasing trend towards global sourcing with local supply chains are also significant challenges.

The following figure shows an overview of the strenghts, weaknesses, opportunities and threats of DTM Group.

Figure 6: SWOT analysis (own figure)

Strengths	Weaknesses
Global leading provider of prop shaft manufacturing. Increasingly strong position in half shafts. Deep product know-how and engineering capability in current core prop shaft segment Scaled tech. know-how in half shafts via takeover of engineers from a key competitor Global presence in key automotive regions Strong, long-standing relationships with premium OEMs.	High customer concentration at Daimler. Late entry into the half-shaft market. Production concentrated in high-cost countries. Limited production presence in China. Dependence on traditional ICE vehicle components.
Opportunities	**Threats**
Growing demand for 4WD and AWD systems in the USA Continued expansion of product portfolio (e.g. stators). Establishment of local manufacturing in North America. Increasing number of half-shaft projects secured from various customers, e.g. BWM	Exposure to volatile trends in the automotive market. Intense price competition and commoditisation. Global sourcing with local supply chain trends. Increasing environmental and regulatory pressures. Technological changes reducing demand for prop shafts.

Based on the SWOT analysis, the DTM should consider the following strategic actions:

- Diversification: Actively pursue diversification of its customer base and product portfolio to reduce dependence on specific segments and customers. This includes expanding more aggressively into half shafts and other components relevant to EVs.
- Cost reduction: Implementing tighter cost control measures, especially in production and logistics, to counter price pressure in high-cost manufacturing regions.
- Expand into new markets: Establish manufacturing capabilities in North America and explore entry into the Chinese market to capitalise on local growth opportunities and mitigate risks associated with global supply chain disruptions.
- Innovation and R&D investment: Increase investment in R&D to develop products that meet the specific needs of electric vehicles, focusing on high torque and NVH (noise, vibration and harshness) requirements.

DTM's established market presence and technical expertise provide a strong foundation to address the challenges posed by the industry's shift to electric mobility. By addressing its weaknesses and threats through strategic diversification, cost management and innovation, DTM can leverage its strengths and opportunities to secure a competitive position in the evolving automotive landscape.

Question D: PESTEL Analysis: What are the external factors that could influence DTM's business strategy and operations? Using PESTEL analysis, identify the key factors and suggest how DTM could effectively respond to these external pressures to increase its competitiveness in the e-mobility

Analysis of question D: To navigate the complex landscape of the automotive industry, especially with the rise of electric mobility (e-mobility), it is critical for DTM to analyse external factors that could impact its business strategy and operations.

Political:

- Regulatory changes: Increasingly stringent emissions regulations in key markets, including Europe and China, are driving automakers towards e-mobility solutions.
- Government incentives: Subsidies for electric vehicles and penalties for high-emission vehicles could significantly change consumer and OEM behaviour.

→ Suggestions: The DTM should focus its R&D efforts on developing components that meet the specific needs of electric vehicles, such more efficient drivetrain systems, and potentially explore partnerships with government programmes to take advantage of incentives.

Economic:

- Global economic fluctuations: Exchange rates, inflation and economic cycles could affect costs, pricing strategies and consumer spending.
- Raw material costs: Fluctuations in the price of raw materials required for automotive manufacturing, such as steel, aluminium and rare earth elements used in electric vehicle batteries, can have a significant impact on DTM's cost structure and pricing strategy.

→ Suggestions: DTM should diversify its supply chain to reduce risks from economic volatility and adjust pricing models to reflect changes in consumer spending and costs. In addition, strategies to stabilise raw material costs are essential. This could include securing long-term contracts with suppliers, broadening the supplier base and adopting technologies that minimise material waste. Exploring cost-effective and environmentally friendly alternative materials could also help align DTM's operations with both economic and sustainability goals.

Social:

- Changing consumer preferences: There is a growing consumer preference for sustainable and energy efficient vehicles.

- Urbanisation trends: Increasing urbanisation is influencing vehicle design towards smaller, more efficient models suitable for urban environments.

→ Suggestions: Focus on innovation in electric and hybrid drivetrains that appeal to urban consumers and strengthen DTM's brand association with sustainability.

Technology:

- Advances in EV technology: Rapid advances in battery technology and electric drivetrains are setting new standards in the industry.
- Digitalisation and automation: These trends are reshaping manufacturing processes and product functionality.

→ Suggestions: Invest in new technologies to improve product offerings and incorporate more automation and digitalisation into manufacturing processes to reduce costs and increase efficiency.

Environment:

- Climate change concerns: There is a global push to reduce carbon footprints, influencing both consumer choices and regulatory frameworks.
- Resource scarcity: Concerns about the availability of key battery raw materials such as lithium and cobalt.

→ Suggestions: Develop recycling programmes for EV components and invest in research into alternative materials that are less resource intensive.

Legal:

- Adhere to global standards: Different regions may have different regulatory requirements for vehicle emissions, safety and component recycling.
- Intellectual property issues: As technology evolves, intellectual property protection becomes critical.

→ Suggestions: Strengthen compliance programmes to ensure that all new products meet global standards and invest in robust intellectual property management to protect innovation.

For DTM to remain competitive in the e-mobility market, it is imperative to consider these external factors and adapt its strategies accordingly. By focusing on innovation, sustainability and market diversification, and by taking advantage of technological advances, DTM can respond effectively to the pressures and opportunities presented by the PESTEL factors. This analysis not only helps DTM align its operations with the external environment, but also provides a strategic framework that can be adapted

to different market conditions, helping to understand the complexities of strategic management in a dynamic industry.

6. Limitations

This thesis provides an in-depth examination of strategic adaptation within the automotive industry, specifically through a focused case study of the DTM Group. While the detailed analysis of DTM's strategic responses provides valuable insights, the study has several limitations that must be acknowledged in order to accurately contextualize the findings. The first limitation stems from the use of a single organization for the case study. Focusing on the DTM Group allows for an in-depth examination of specific strategic decisions and outcomes. However, this approach may limit the generalizability of the findings to the wider automotive industry, particularly to companies that differ significantly in size, market scope or geographical distribution. The specificity of the case study may also limit the applicability of the conclusions to other contexts where business dynamics are significantly different. Data collection for this thesis was primarily through semi-structured interviews, internal company documents and secondary sources such as industry reports. While these sources are rich in detail, they introduce potential biases. Interviews may reflect personal views or selective memories, and company documents are often curated to present the organisation in a favourable light. In addition, the rapid nature of technological advances and market shifts in the automotive sector means that recent developments may not be fully reflected in the data collected, posing a challenge to maintaining the relevance of the study over time. In addition, the focus on DTM's operations primarily in Europe and North America may not capture the strategic nuances relevant to other global regions such as Asia or Africa. These areas have different market environments, consumer behaviours and regulatory frameworks, which may lead to different strategic imperatives. The theoretical frameworks used to analyse strategic adaptation in this study are also a limitation. The selection of specific theories may frame the research findings in a particular light, potentially overlooking alternative explanations or strategies that may be equally valid. Broadening the theoretical base or using different models could provide a more holistic view of the strategic challenges and opportunities faced by firms in a rapidly evolving industry.

Acknowledging these limitations is crucial for a nuanced interpretation of the research findings and for charting a constructive path for future studies. Subsequent research could broaden the scope by including a more diverse set of firms, broadening the geographical focus, or integrating newer theoretical perspectives. Such efforts would enhance the robustness of the conclusions and provide a richer understanding of how companies across the automotive industry can navigate the complexities of strategic adaptation in an era of significant technological change.

7. Conclusion

This thesis has explored the complex process of strategic adaptation within the automotive industry, focusing on the DTM Group as a key case study. This research has shown that the ability to strategically adapt is not only beneficial, but essential for survival in an industry characterised by rapid technological change and shifting market dynamics. DTM's journey from a traditional automotive supplier to a forward-looking player in the electric vehicle market illustrates the profound impact of external pressures such as environmental regulations, technological advances and evolving consumer preferences. The company's strategic pivot towards electric and hybrid vehicle components, while challenging, demonstrates a proactive approach to exploiting new market opportunities. This adaptation strategy, based on dynamic capabilities, has enabled DTM to maintain its competitive edge and relevance in a changing automotive landscape. DTM's case study provides valuable lessons on the importance of agility and foresight in business strategy. The company's ability to recognise the diminishing prospects for internal combustion engine components and its timely shift to electric drivetrains is a testament to its robust strategic planning processes. Furthermore, DTM's commitment to diversifying its product portfolio and expanding into new geographical markets underlines the critical role of innovation in sustaining growth. However, as discussed in the limitations of this study, findings from a single case study should be interpreted with caution. While they provide detailed insights into one company's response to industry-wide challenges, these findings may not be universally applicable across different organisational contexts or global regions. Future research should aim to extend the findings of this paper by examining strategic adaptation in other automotive firms, including those in emerging markets, in order to increase the generalisability of the conclusions. In addition, examining the role of technological partnerships and collaborative innovation in strategic adaptation could provide deeper insights into the mechanisms that facilitate successful industry transformations.

In conclusion, this thesis highlights the dynamic interplay between strategy, technology and market forces in shaping the future of the automotive industry. As companies like DTM navigate these turbulent waters, their stories enrich our understanding of strategic management and offer guiding principles for other firms facing similar existential challenges. The ongoing transformation of the automotive industry is not just a story of technological innovation, but a broader narrative about the power of strategic adaptability in the face of inevitable change.

8. Appendix

Table 4: Employee Interview Summary

Questions	**Answers (summarized)**
1: How has DTM´s strategic planning evolved to address the market shifts towards electrification?	DTM's strategic planning has evolved significantly to address the market shift towards electrification, with a focus on the development and production of half shafts, which are critical for electric vehicles (EVs). The company has invested in advanced engineering capabilities and recruited experienced engineers from competitors to strengthen its position in the EV market.
2: What specific measures have been taken to diversify the customer base?	DTM has implemented a strategic initiative to diversify its customer base by targeting new geographic regions and market segments with high growth potential and less competitive pressure. This includes entering the North American SUV market and expanding collaborations with OEMs such as Ford and Stellantis. In addition, DTM secured projects with BMW and Great Wall Motors in China, reducing its dependence on Daimler, which previously accounted for almost half of its revenues.
3: How does DTM prioritize its product development in response to market demands?	DTM prioritises product development by closely monitoring market trends and customer feedback. The focus is on developing high-demand components for EVs, such as half shafts, and enhancing existing products to meet the evolving needs of hybrid and ICE vehicles. The company uses a modular approach to streamline development costs and improve efficiency, ensuring that new products are aligned with customer needs and market dynamics.
4: What role does innovation play in DTM´s current strategy?	The company has significantly increased its R&D investment to drive the development of new technologies and products. The company has a robust R&D pipeline with ongoing projects aimed at improving product performance and cost efficiency. The reorganisation of the R&D department and the recruitment of nine experts from key competitors have further strengthened DTM's innovative capabilities. DTM also started to build up R&D facilities in all major markets they operate in, in order to keep the different markets under close observation.
5: Can you provide examples of successful strategic initiatives that have been implemented recently?	Recent successful initiatives include the automation of the Haldensleben plant, which has resulted in a 20% reduction in defect rates and increased production efficiency. The strategic localisation of production in South Carolina has also been key, reducing lead times and shipping costs while improving supply chain resilience. In addition, the outsourcing of key components to low-cost countries has resulted in significant cost savings, further strengthening DTM's competitive position.

6: How does DTM ensure strong relationships with its key customers?	DTM maintains strong relationships with its key customers through ongoing engagement and collaboration. Regular communication, joint development projects and dedicated customer support teams help to maintain strong relationships. DTM's focus on quality and reliability builds trust and long-term partnerships.
7: What steps does DTM take to maintain high customer satisfaction and loyalty?	To maintain high levels of customer satisfaction and loyalty, DTM focuses on delivering high quality products, meeting delivery schedules and offering competitive prices. The company also invests in customer-specific R&D projects to ensure that its solutions meet the unique needs of each customer. Feedback mechanisms are in place to address any issues promptly and to adapt to changing customer requirements. With the introduction on detailed KPI tracking DTM is able to update their customers about the production process at any time and give accurate timing forecasts.
8: How do customer feedback and requirements influence DTM's product development?	Customer feedback is a key driver in DTM's product development. The company actively seeks input from its customers to understand their evolving needs and preferences. This feedback informs R&D efforts and ensures that new products are aligned with market needs. Collaborative development projects further integrate customer insights into the design and engineering process.
9: Can you describe any recent customer collaborations that have been particularly successful?	Recent successful collaborations include joint development projects with BMW and VW. These partnerships have focused on optimising drivetrain components for new EV models, resulting in improved performance and efficiency. The collaborative approach has strengthened relationships with these key customers and positioned DTM as a preferred supplier for future projects.
10: What strategies are in place to mitigate customer concentration risks?	To mitigate the risks associated with customer concentration, DTM has diversified its customer base and expanded into new geographic markets. By securing contracts with several OEMs, including Ford, GM and Great Wall Motors, DTM has reduced its dependence on Daimler. In addition, the company is continuously seeking new business opportunities and investing in building long-term relationships with a broader range of customers.
11: What operational changes have been made to improve efficiency and reduce costs?	Operational changes include the outsourcing of nine key components to low-cost countries such as China, which has resulted in significant cost savings. In addition, DTM has standardised parts to streamline production processes and reduce complexity. Investments in automation and digitalisation have further improved operational efficiency and reduced costs.

12: Can you give examples of how these changes have impacted production?	The automation of the Haldensleben plant has increased production efficiency and reduced defect rates by 20%. The strategic localisation of machining operations in South Carolina has reduced lead times and shipping costs, making the supply chain more resilient and responsive to the demands of the North American market. These changes have improved overall production capacity and reliability.
13: How does DTM manage its supply chain to ensure reliability and cost effectiveness?	DTM manages its supply chain through strategic sourcing, strong supplier relationships and advanced supply chain management technologies. The company uses digital tools to monitor inventory levels and optimise logistics operations to ensure on-time delivery and cost control. By diversifying its supplier base and implementing just-in-time manufacturing principles, DTM maintains a reliable and efficient supply chain.
14: What is the role of technology in improving operational efficiency?	The company has implemented digital control systems and standardised KPIs across its plants, enabling real-time performance tracking and decision-making. Advanced manufacturing technologies, such as automated production lines, have also been instrumental in improving efficiency and reducing costs.
15: How does DTM balance the need for high quality production with cost constraints?	Balancing high quality production with cost constraints is achieved through a combination of innovation, process optimisation and strategic sourcing. DTM invests in advanced technologies and continuous improvement initiatives to increase production efficiency. By outsourcing non-core components and standardising parts, DTM can focus on high-value activities while controlling costs. Rigorous quality control measures ensure that all products meet stringent standards despite cost-cutting efforts.
16: How does DTM position itself against its main competitors?	DTM positions itself against competitors by leveraging its engineering expertise, commitment to quality and customer-centric approach. The company differentiates itself through innovative product offerings, strong customer relationships and a focus on advanced drivetrain technologies. Competitive pricing and strategic localisation also strengthen DTM's market position.
17: What are the key trends in the automotive industry that impact DTM's strategy?	Key trends impacting DTM's strategy include the rapid shift towards electrification, increasing regulatory pressure to reduce emissions and growing consumer demand for sustainable vehicles. Advances in battery technology and the expansion of EV infrastructure are also significant. These trends are driving DTM to continually innovate and adapt its product offering to meet market needs. The trend towards lighter ICE vehicles is also an interesting one for DTM, which is already doing a lot of prototyping and development work to produce lighter drivetrain components and be at the forefront of the trend.

18: How does DTM adapt to changing market conditions and consumer preferences?	DTM adapts to changing market conditions and consumer preferences by closely monitoring industry trends and proactively adjusting its strategies. This includes investing in R&D to develop products that meet new regulatory requirements and consumer expectations. The company also engages in regular dialogue with customers to understand their needs and preferences to ensure that DTM's products remain relevant and competitive.
19: What competitive advantages does DTM use to maintain its market position?	DTM uses several competitive advantages to maintain its market position, including strong engineering capabilities, a diversified product portfolio and a reputation for high quality manufacturing. Strategic partnerships, continuous innovation and a focus on customer satisfaction further strengthen DTM's competitiveness. The company's new ability to adapt more quickly to market changes and its proactive approach to cost management also play a key role.
20: How does DTM see the future of the automotive industry and what steps is it taking to prepare?	DTM sees a future where electrification and sustainability are at the heart of the automotive industry. To prepare, the company is investing heavily in the development of EV-ready components and expanding its manufacturing capabilities to support this shift. DTM is also exploring new markets and broadening its customer base to mitigate risks and capitalise on emerging opportunities. Continuous innovation and strategic partnerships are key components of DTM's forward-looking strategy.

Table 5: Market Expert Interview Summary

Questions	**Answers (summarized)**
1: What are the key trends in the automotive industry affecting companies like DTM?	Key trends impacting companies like DTM include the rapid shift towards electrification, driven by stringent emissions regulations and advances in battery technology. Market experts note that Europe and China are leading this shift due to aggressive regulatory frameworks and significant government incentives to encourage EV adoption. In addition, there is a growing trend towards lightweight and high performance components to improve the efficiency and range of electric vehicles. Increasing emphasis on sustainability and reducing carbon footprints is also driving demand for innovative driveline technologies.
How is the competitive landscape for drivetrain component manufacturers evolving?	The competitive landscape for drivetrain component manufacturers is becoming increasingly dynamic. Established players are investing heavily in EV technologies and forming strategic partnerships to stay competitive. New entrants are focusing on specialised EV components, intensifying competition. Companies like DTM are challenged to maintain their market position while adapting to new technologies and

	changing customer demands. The trend towards local manufacturing in key markets such as North America and APAC is also reshaping the competitive landscape as OEMs favour suppliers that can provide localised production and support.
What are the major technological advances affecting the automotive industry?	Key technological advancements affecting the automotive industry include improvements in battery technology that have extended the range and reduced the charging time of EVs, making them more competitive with ICE vehicles. In addition, advances in lightweight materials, such as advanced composites and high-strength alloys, are critical to improving vehicle efficiency and performance. The integration of digital technologies, including advanced manufacturing automation and supply chain management systems, is also transforming production processes and improving operational efficiency.
How are regulatory changes affecting the strategic decisions of automotive suppliers?	Regulatory changes play a critical role in shaping the strategic decisions of automotive suppliers. Stringent emissions regulations in regions such as Europe and China are driving OEMs and their suppliers to invest heavily in EV technologies to meet these standards. Penalties for non-compliance are significant, forcing suppliers to innovate and adapt quickly. Regulations are also influencing the adoption of sustainable practices and the development of environmentally friendly materials and components. Suppliers such as DTM must continually monitor regulatory developments and adapt their strategies accordingly to remain competitive and compliant.
What growth opportunities and potential risks do you see for DTM in the evolving automotive market?	Growth opportunities for DTM include expanding its presence in the EV market by developing advanced driveline components tailored for electric drivetrains. The increasing demand for lightweight and high performance components offers significant growth potential. However, potential risks include reliance on a few large customers, which can lead to revenue volatility if these customers change their sourcing strategies. In addition, staying ahead of the competition requires continuous innovation and significant investment in R&D. The dynamic regulatory environment and the need to adapt quickly also present challenges.
How can DTM better align its operations and product development with regional market conditions and regulatory landscapes?	To better align its operations and product development with regional market conditions and regulatory landscapes, DTM should focus on strategically localising its manufacturing capabilities, particularly in key markets such as North America and APAC. This approach will reduce lead times, improve supply chain resilience and increase responsiveness to local market demands. DTM should also invest in understanding regional regulatory requirements and consumer preferences and tailor its product offering accordingly. Collaborative partnerships with local OEMs and suppliers can further strengthen DTM's market position and ensure compliance with regional standards.

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