FROM TRADITION TO TRANSFORMATION: THE ROLE OF DIGITALIZATION IN ADVANCING BUSINESS MODEL INNOVATION

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Abstract

This study examines the impact of digitalization on business model innovation within the automotive industry, comparing traditional manufacturer BMW with electric vehicle pioneer Tesla. The research explores how digital technologies catalyze transformation in legacy companies and enable innovation in new entrants. Utilizing a comparative case study methodology, this paper analyzes the strategies employed by both companies to integrate digitalization into their business models. For BMW, the focus is on digital transformation initiatives and their integration with traditional automotive manufacturing. Conversely, Tesla is evaluated on its digital-native approach that disrupts the conventional market landscape. This study employs a mixed-methods approach, collecting both qualitative data from interviews with industry experts and quantitative data from market performance metrics. Findings suggest that digitalization offers diverse pathways to innovation, with BMW capitalizing on efficiency gains and incremental innovation, while Tesla leverages its digital core for radical innovation and market differentiation. The study contributes to the discourse on digital transformation by highlighting the need for a nuanced understanding of how digitalization can be harnessed for business model innovation. This is crucial for traditional companies aiming to remain competitive and for newcomers seeking to disrupt the industry. The implications of this research extend beyond the automotive sector, offering insights into the digitalization processes applicable to a wide range of industries facing similar transformative challenges.

Keywords: *digitalization, business model innovation, automotiveiIndustry, organizational transformation*

Clasificare JE: *F00, L26, M19, O32*

1. Introduction and context of the study

In an era where digitalization is reshaping industries, understanding its impact on business model innovation becomes crucial. The automotive sector, characterized by its robust traditions and engineering heritage, is currently at an inflection point where digital technologies are driving substantial transformation. This paper explores the evolving landscape of business model innovation through digitalization, focusing on two emblematic companies: BMW, with its rich legacy in premium automotive manufacturing, and Tesla, an archetype of the digital-age automotive company.

The literature on digital transformation (Schwab, 2016) suggests that companies like BMW face the dual challenges of preserving the value of their legacy while simultaneously embracing digital innovation. Tesla, on the other hand, represents a new breed of automakers that are digital natives (Westerman et al., 2014), disrupting the industry with novel approaches to car design, production, and sales. This study aims to elucidate how these contrasting business models reflect the companies' strategic responses to digitalization (Porter and Heppelmann, 2014), investigating the extent to which digital technologies can be a source of competitive advantage and a driver for innovation (Teece, 2018).

The primary goal of this research is to dissect and compare the impact of digitalization on the business models of BMW and Tesla. This is pursued through the following questions: How has

digitalization facilitated business model innovation in the automotive industry? What are the differences and similarities in the approach of traditional and modern players towards digitalization? The methodology adopted includes a comparative case study analysis, drawing on data from secondary sources such as corporate reports, industry analyses, and expert interviews.

Preliminary results reveal a complex interplay between tradition and transformation. BMW appears to strategically balance its legacy practices with digital advancements (Kagermann, 2015), while Tesla's business model is intrinsically woven with digitalization (Musk, 2016), leveraging it for disruptive innovation. These findings not only contribute to academic discourse but also offer practical insights for industry leaders navigating the digital revolution.

2. Literature review

The automotive industry's journey towards digitalization can be traced back to the advent of electronic fuel injection systems in the late 20th century, a departure from the mechanical systems of the past (Womack et al., 1990). This paradigm shift marked the beginning of a digital era that would eventually encompass every aspect of automotive design, manufacturing, and after-sales service. The adoption of Computer-Aided Design (CAD) systems revolutionized vehicle development processes, streamlining design and enhancing precision (Clark and Fujimoto, 1991).

As the new millennium approached, the rise of the internet and connected technologies presented new opportunities and challenges (Toma et al., 2019). The industry witnessed the introduction of advanced driver-assistance systems (ADAS) and the integration of in-vehicle infotainment systems, which began the ongoing convergence of automotive and information technologies (Smith, 2006).

In recent years, the rapid progression of digital technologies has reshaped the automotive landscape. The emergence of the Internet of Things (IoT) has given rise to connected cars, enabling vehicles to communicate with each other and with infrastructure (Porter and Heppelmann, 2014). This connectivity is not only enhancing the driving experience but is also a cornerstone in the development of autonomous vehicles (Fagnant and Kockelman, 2015).

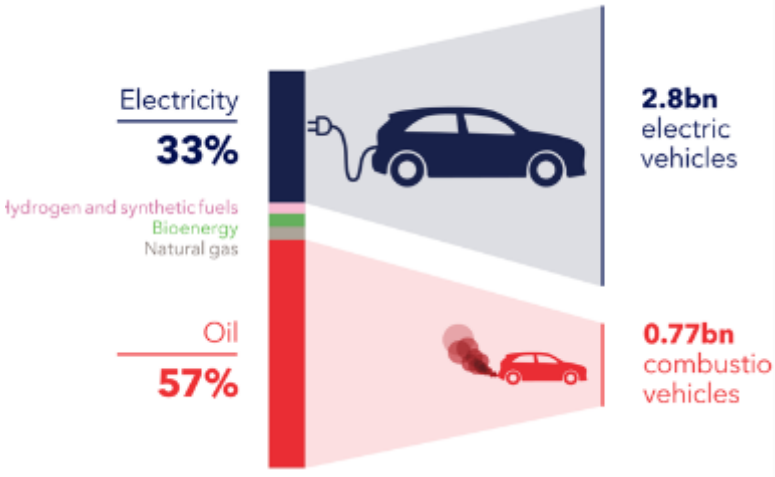


Figure No. 1: Automotive Industry Evolution 2023 vs. 2050
Source: Forbes, 2023

Electrification, ride-sharing, and smart manufacturing are current trends fueled by digitalization. Digital platforms now facilitate car-sharing services, challenging traditional ownership models (Cohen and Kietzmann, 2014). In manufacturing, Industry 4.0 technologies have introduced unprecedented levels of automation, data analytics, and real-time supply chain management (Schwab, 2017).

The implementation of digital technologies in automotive manufacturing has resulted in 'smart factories' characterized by their flexibility, efficiency, and sustainability (Rüßmann et al., 2015). These factories leverage robotics, sensors, and data analytics to optimize production and reduce environmental impact. Moreover, the digitalization of services has expanded the customer relationship beyond the point of sale, with manufacturers offering software updates, remote diagnostics, and a range of digital services that extend the lifecycle of the vehicle (Kagermann et al., 2013).

Digitalization has also opened avenues for new business models. Subscription services, data monetization, and after-sales digital services provide continuous revenue streams and deepen customer engagement (Porter and Heppelmann, 2014). The digitalization trajectory of the automotive industry reflects a profound transformation influenced by technological advancements, changing consumer expectations, and new competitive dynamics. The resultant impact on manufacturing and services has set the stage for an era of innovation and competition, driven by digital capabilities. Today's automotive companies are facing fierce competition all over the world (Toma, 2013; Toma and Marinescu, 2015) in the age of globalization (Toma, 2005). This is why high-performance automotive companies should not only integrate digitalization in their business processes (Toma and Tohănean, 2018) but also be strategic oriented (Toma and Grădinaru, 2016; Toma et al., 2016a; Toma et al., 2016b), creative (Toma et al., 2018), entrepreneurial (Grădinaru et al., 2017; Zainea et al., 2020), quality-oriented (Toma, 2006; Naruo and Toma, 2007; Marinescu and Toma, 2008), socially responsible (Toma, 2008; Toma and Naruo, 2009; Toma et al., 2011).

3. Methodology

The authors used a qualitative research method. They identified, analysed and synthesised the data from various secondary sources.

4. Results and discussion

a) Case Study: BMW

Bayerische Motoren Werke AG, commonly known as BMW, has been a beacon of innovation and quality in the automotive industry since its inception in 1916. Originally an aircraft engine manufacturer, BMW transitioned to motorcycle production in the early 1920s and later to automobiles. This evolution marked the beginning of BMW's journey as a premium automaker.

Key milestones in BMW's history include the launch of iconic models like the BMW 3 Series, which set new standards in the executive car segment. BMW's traditional business model focused on high-quality, luxury vehicles, emphasizing performance and driver enjoyment (Tohanean et al., 2018). The introduction of the 'i' series in 2011, with models like the i3 and i8, showcased BMW's commitment to innovation, particularly in electric vehicles.

Today, BMW's business model encompasses a wide range of products, from luxury sedans and SUVs to sports cars and electric vehicles. This diversification allows BMW to cater to various market segments. BMW's revenue streams are multifaceted, including car sales, after-sales services, and financial services. The company has positioned itself as a leader in the premium automotive segment, emphasizing quality, innovation, and sustainability (Tohanean et al., 2019).

BMW's value proposition lies in its brand reputation for quality and innovation. The company has consistently pushed boundaries in automotive technology, enhancing its competitive edge in the traditional automotive market.

The german established automacer has recognized the potential of digitalization early on, embarking on a transformative journey to integrate digital technologies across its operations. The adoption of AI, IoT, and data analytics has been pivotal in enhancing BMW's manufacturing processes, customer experiences, and new product development (Toma et al., 2014).

Through theyears BMW has launched several initiatives to embed digitalization in its operations. For instance, the use of AI in quality control processes and the incorporation of IoT in its manufacturing plants have significantly improved efficiency and productivity. BMW's ConnectedDrive, a suite of digital services, exemplifies how the company has embraced digitalization to enhance customer experience.

BMW has skillfully integrated digital technologies into its manufacturing processes. The use of digital twins, predictive maintenance, and automation has revolutionized its production lines, leading to increased efficiency and reduced downtime. This integration has also positively impacted BMW's supply chain management, enabling more agile and responsive production strategies (Hautala-Kankaanpää, 2022).

Integrating digital technologies into a well-established business model is not without challenges (Toma et al., 2019). BMW has faced organizational and cultural hurdles in aligning its traditional practices with new digital approaches. The company has had to adapt its workforce skills and organizational structures to keep pace with the digital era.

Digitalization offers BMW numerous opportunities to strengthen its market position. By harnessing digital technologies, BMW can further differentiate its products, enhance customer experiences, and streamline operations. The digital era opens up new avenues for innovation, allowing BMW to maintain its edge as a premium automaker (Tohanean et al., 2019).

Looking ahead, BMW is well-positioned to continue its leadership in the digital era. The company's commitment to digital innovation will likely lead to more personalized, connected, and sustainable mobility solutions. The strategic implications of BMW's digitalization efforts extend beyond immediate operational efficiencies, setting the stage for long-term sustainability and relevance in a rapidly evolving automotive landscape.

Below, is the overview of BMW business model (Figure No. 2):

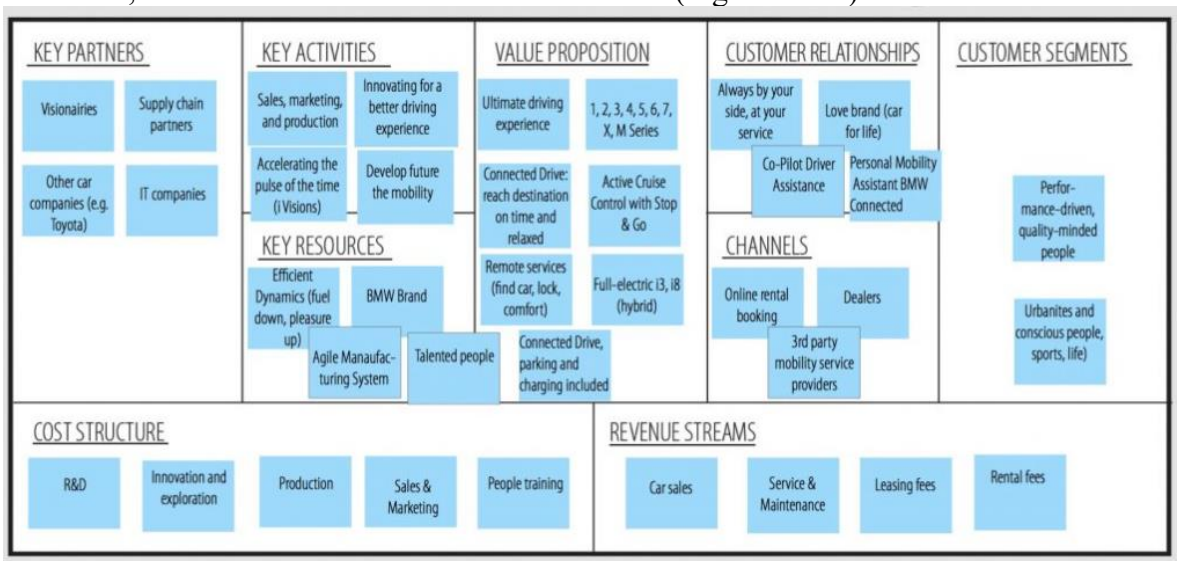


Figure No. 2: BMW Business Model Canvas
Source: Strategyzer, 2023

b) Case Study: Tesla

Tesla, Inc., since its inception in 2003, has emerged as a trailblazer with its mission to accelerate the world's transition to sustainable energy. Unlike traditional automotive manufacturers, Tesla's business model is built on a foundation of innovation and disruption. Pioneering in the electric vehicle (EV) market, Tesla's approach diverges significantly from conventional automotive practices, particularly in its integration of technology and sustainability into every facet of its operations.

Tesla's product lineup is a testament to its innovative strategy. The company offers a range

of electric vehicles, including the Model S, Model 3, Model X, and Model Y, each targeting different market segments. Beyond EVs, Tesla has expanded into renewable energy solutions, like battery storage systems and solar products, further solidifying its position in the sustainable energy market. Tesla's direct-to-consumer sales model disrupts traditional dealership models, allowing for greater control over customer experience and pricing.

Sustainability is deeply ingrained in Tesla's business model. The company's commitment to reducing carbon footprints is evident in its eco-friendly manufacturing practices and products. Technologically, Tesla stands at the forefront of innovation. Its manufacturing processes integrate state-of-the-art technology to enhance efficiency and product quality, setting new benchmarks in the automotive industry.

Tesla's operations are fundamentally digital-first. The company embraces a digital-native strategy, with software and connectivity at the heart of its vehicles. This approach allows for continuous improvements through over-the-air software updates, enhancing vehicle performance and user experience long after the purchase.

Tesla's manufacturing techniques, particularly the Gigafactory concept, revolutionize traditional automotive production. These factories are highly automated and optimized for large-scale production of EVs and batteries. Digitalization plays a crucial role in Tesla's supply chain and logistics, enabling efficient and responsive production cycles.

Data analytics and artificial intelligence are integral to Tesla's operation. The company uses data collected from its vehicles to improve functionality and develop autonomous driving capabilities. This focus on AI and data underscores Tesla's commitment to innovation and technological advancement (Tohanean et al., 2019).

Tesla has not only entered the automotive market but also redefined it. The company's approach challenges the traditional automotive industry standards, particularly in sustainability and electrification. Tesla's success has accelerated the EV market, pushing other manufacturers to prioritize sustainable practices and electric vehicle production.

Tesla's success story serves as a catalyst for digital and technological adoption in the automotive industry. Its strategies in digitalization and innovation have set new precedents, prompting traditional manufacturers to rethink their approaches to car design, production, and sales.

Looking forward, Tesla is poised to continue its trajectory of growth and innovation. The company's future strategies, especially in expanding its product range and enhancing its technological capabilities, are likely to have significant implications for the automotive industry. Tesla's business model and digitalization strategies offer a blueprint for how automotive companies can thrive in an increasingly digital and sustainable future.

Below, is the overview of Tesla business model (Figure No. 3):

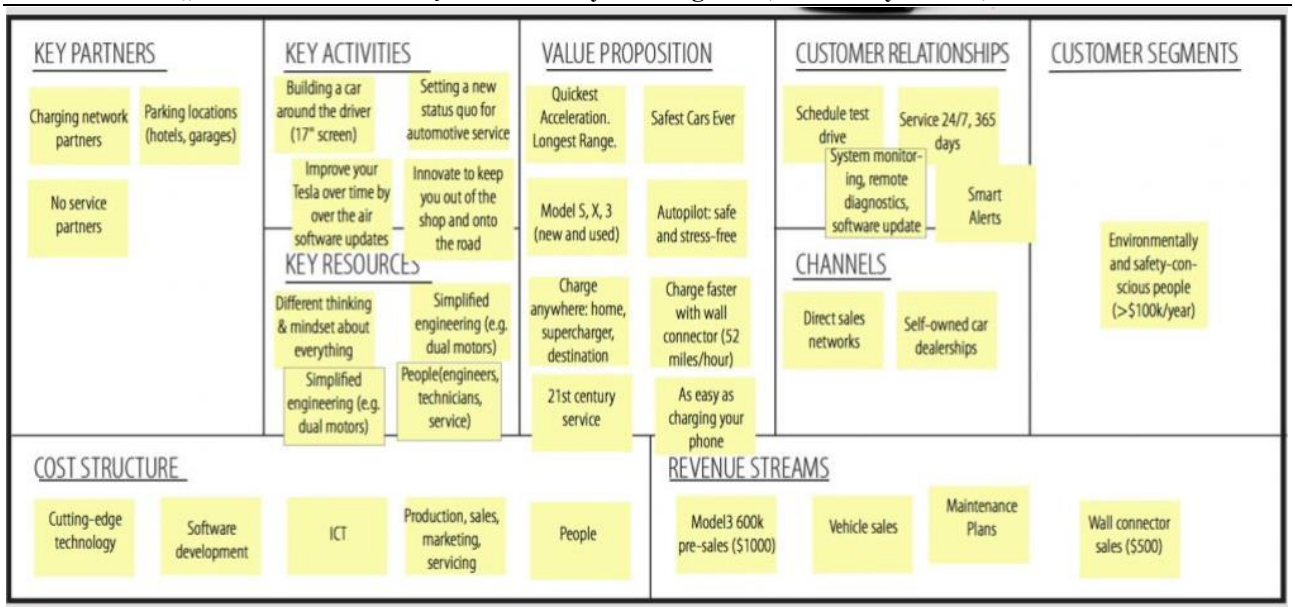


Figure No. 3: Tesla Business Model Canvas
Source: Strategyzer, 2023

c) Comparative Analysis: BMW vs. Tesla

To dissect the digitalization strategies of BMW and Tesla, a multi-faceted analytical framework is employed. This framework encompasses both qualitative and quantitative elements to provide a comprehensive understanding of each company's approach. The analysis is structured around four key dimensions: digitalization in product development, customer engagement and digital marketing strategies, supply chain and operational digitalization, and digital innovations with an emphasis on sustainability initiatives. These areas offer a lens through which the digitalization efforts of BMW and Tesla can be critically examined and compared.

Both BMW and Tesla share a commitment to leveraging digitalization for enhancing efficiency and improving customer experience. In their respective strategies, there is a clear emphasis on adopting cutting-edge technologies like AI and IoT, which are instrumental in driving innovation and staying competitive.

BMW's approach to digitalization can be characterized as integrative, where digital technologies are melded with traditional manufacturing practices. This strategy reflects an evolution, building on BMW's legacy of engineering excellence. Conversely, Tesla's strategy is revolutionary, being a digital-native entity that embeds digital technology at the core of its business model. This fundamental difference extends to the companies' digital culture and organizational structures, with BMW leaning towards a more conventional corporate structure, whereas Tesla adopts a more fluid and dynamic digital-centric model.

BMW's journey of integrating digitalization with its established manufacturing model has led to significant enhancements in operational efficiency and broadened its product portfolio. Digitalization initiatives have enabled BMW to develop sophisticated customer engagement platforms, elevating the customer experience and expanding market reach.

Tesla's inception as a digital-native company has allowed it to pioneer a disruptive business model, underpinned by radical innovation. This approach has not only set Tesla apart in terms of market differentiation but has also scaled its operations rapidly, all the while maintaining a strong commitment to sustainability. Tesla's digitalization strategy has redefined industry norms,

showcasing the potential of a fully integrated digital business model.

The comparative analysis of BMW and Tesla's digitalization strategies highlights a spectrum of approaches in integrating digital technology into business models. BMW's strategy illustrates the potential of digitalization to enhance and evolve existing business models, optimizing and expanding traditional manufacturing processes. On the other hand, Tesla's approach exemplifies how digitalization can be the bedrock of a disruptive and innovative business model, challenging and redefining industry standards.

Both companies' experiences provide valuable lessons for the automotive industry and beyond. BMW demonstrates how established companies can embrace digital transformation to remain competitive and relevant. Tesla, meanwhile, serves as a testament to the power of digitalization in creating new market opportunities and reimagining industry paradigms. The diverse pathways to innovation highlighted in this analysis underscore the multifaceted impact of digitalization across different business models and market strategies.

5. Conclusions

The exploration of digitalization's role in advancing business model innovation through the case studies of BMW and Tesla reveals a multifaceted landscape of adaptation and evolution. This research has shown that digitalization is not a one-size-fits-all process, rather, it is a nuanced transformation that varies significantly between traditional and modern players in the automotive industry.

For BMW, digitalization has facilitated a careful integration of new technologies into existing frameworks, preserving the core aspects of their heritage while seeking incremental innovation. Their approach exemplifies a prudent evolution, reflective of an established company cautious not to disrupt its legacy yet eager to remain relevant in a digitized world.

Tesla, in contrast, embodies the ethos of a digital-native company, with business models built around and deeply integrated with digital technologies. Its approach has disrupted the traditional automotive industry norms, redefining consumer expectations and setting new benchmarks for innovation. Tesla's strategy underlines the potential for digitalization to be the cornerstone of radical transformation and market differentiation.

Despite their differing strategies, both companies recognize digitalization as a critical driver of business model innovation. The convergence towards digital technologies signifies an industry-wide acknowledgement that future competitiveness hinges on the successful integration of digitalization.

The comparison uncovers that, regardless of the starting point, the trajectory towards digital-enabled business models is inevitable. BMW's adaptation and Tesla's radical innovation serve as archetypes for how traditional companies can navigate digitalization and how new entrants can exploit it to disrupt and lead.

In conclusion, this study contributes to a deeper understanding of the strategic imperatives posed by digitalization in the automotive industry. It highlights the contrast between evolutionary and revolutionary approaches to business model innovation and offers insights into the continuous interplay between tradition and transformation. As digitalization continues to permeate every facet of business, the lessons drawn from BMW and Tesla are invaluable for organizations striving to forge their path in the digital era.

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