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Moving from Product-Oriented to Platform-Oriented Business Models: How Auto-makers Become Platform Providers through Connected Cars

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MOVING FROM PRODUCT-ORIENTED TO PLATFORM-ORIENTED BUSINESS MODELS: HOW AUTOMAKERS BECOME PLATFORM PROVIDERS THROUGH CONNECTED CARS

DE MODELOS DE NEGOCIO ORIENTADOS AL PRODUCTO A MODELOS ORIENTADOS A PLATAFORMAS: CÓMO LOS FABRICANTES DE AUTOMÓVILES SE CONVIERTEN EN PROVEEDORES DE PLATAFORMAS A TRAVÉS DE LOS AUTOS CONECTADOS

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Sumario: 1. Introduction. 2. Theoretical background. 3. Research method. 4. Results. 5. Discussion. 6. Conclusions. Funding. References. Appendix A.

ABSTRACT

Many product manufacturers are transitioning into platform providers, a shift that requires a series of organizational changes. Nevertheless, limited attention has been given to the motivations behind this shift and the specific organizational changes undertaken by manufacturers seeking to become platform providers. To address this gap, this paper explores the connected cars landscape. Specifically, it examines the organizational transformation of automakers as they evolve from product-oriented to platform-oriented business models following the introduction of connected cars. This study draws on data from 12 automakers in the Brazilian automotive industry. The findings reveal three primary moti-

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vations driving automakers' shift toward connected car business models and highlight six key organizational changes that support this transformation. These insights offer valuable theoretical and managerial guidance for servitization researchers and practitioners working with platform-oriented business models.

Keywords: Digital servitization, Digital platforms, Organizational change, Connected cars, Automotive industry.

RESUMEN

Muchas empresas manufactureras están transitando hacia convertirse en proveedores de plataformas, un cambio que requiere una serie de transformaciones organizacionales. Sin embargo, se ha prestado poca atención a las motivaciones que impulsan esta transición y a los cambios organizacionales específicos emprendidos por los fabricantes que buscan convertirse en proveedores de plataformas. Para abordar esta brecha, este artículo explora el panorama de los autos conectados. En particular, examina la transformación organizacional de los fabricantes de automóviles a medida que evolucionan de modelos de negocio orientados al producto hacia modelos orientados a la plataforma tras la introducción de los autos conectados. Este estudio se basa en datos de 12 fabricantes de automóviles de la industria automotriz brasileña. Los hallazgos revelan tres motivaciones principales que impulsan la transición de los fabricantes hacia modelos de autos conectados y destacan seis cambios organizacionales clave que respaldan esta transformación. Estos aportes ofrecen valiosas orientaciones teóricas y gerenciales para investigadores de servitización y profesionales que trabajan con modelos de negocio orientados a la plataforma.

Palabras clave: Servitización digital, Plataformas digitales, Cambio organizacional, Autos conectados, Industria automotriz.

1. Introduction

Supported by recent advances in Industry 4.0, manufacturers have started to embed digital technologies, such as IoT sensors, big data analytics tools, and cloud computing, into physical products, enabling these companies to transition to providing digital platforms (Beverungen et al., 2021; Lerch et al., 2024; Markfort et al., 2022; Van Dyck et al., 2024). By advancing the platform approach, manufacturers can collect various data from connected products, providing them with rich information about product usage conditions and customer operations (Fu et al., 2022). These data provide key insights for delivering advanced digital services to customers (Jovanovic et al., 2022; Kapoor et al., 2022). Therefore, digital platforms facilitate manufacturers in their transformation toward digital servitization (Favoretto et al., 2022; Frank et al., 2019).

In the automotive industry, leading automakers have been advancing digital servitization as a way to provide new mobility services (mobility as a service) to customers (Genzlinger et al., 2020). More recently, a new

drive for digital servitization in this sector is the implementation of connected cars. Through vehicle connectivity, automakers can make use of the wide availability of data collected from cars to expand the offering of digital services (Svahn et al., 2017; Turienzo et al., 2023). For instance, General Motors, through its OnStar service, collects data and enables vehicle connectivity with external devices, thus providing a digital platform with several features such as vehicle diagnostics (e.g., information on fuel efficiency, odometer, and tire pressure), geolocation, infotainment systems, remote commands (e.g., engine start), and over-the-air updates. Therefore, connectivity allows the car to become a mobile services platform, generating new opportunities for creating and capturing value for automakers and other actors in their ecosystem (Bohnsack et al., 2021; Weiss et al., 2020).

Nevertheless, the vast majority of industrial manufacturers have faced challenges in successfully implementing their digital platforms, especially because they have failed to establish the organizational changes necessary to support the transition from products to platforms (Lerch et al., 2024). In particular, many automakers are still struggling to adapt their product business models to include mechanisms for creating and capturing value through platform models following the introduction of connected cars (Bohnsack et al., 2021; Turienzo et al., 2023). In turn, the current literature also does not provide clear empirical evidence to support this organizational transformation. In fact, studies on platforms have focused on companies that grew with a platform logic. On the other hand, evidence from product companies that transitioned to a platform logic is limited (Van Dyck et al., 2024). In this paper, we seek to fill this research gap by building a model that explains the organizational transformation of automakers toward connected car business models.

Our study builds on Pettigrew's (1988) perspective on organizational change, which posits that transformations within companies occur through an interaction between context, content, and process. These dimensions highlight the circumstances of the change (context), what actually changed within the company (content), and how the change occurred (process) (Baines et al., 2020; Pettigrew, 1988). Due to the lack of research on organizational changes within automakers toward connected cars, we will focus on the context and the content to understand the motivations and actual shifts toward this platform-oriented business model. Therefore, we propose the following research questions:

(RQ1): What motivates automakers to transform toward connected car business models?

(RQ2): What organizational changes are necessary to support this transformation?

To address these research questions, we conducted a qualitative research based on multiple case studies. Specifically, we investigated 12 automakers in the Brazilian automotive industry that implemented new connected car business models. Our findings identify three primary motivations driving automakers' shift toward connected car business models, along with six key organizational changes enabling this transformation. Thus, our study contributes to the literature and practice on digital servitization in three specific ways. First, it extends prior studies (e.g., Lerch et al., 2024; Van Dyck et al., 2024) by illustrating how traditional product companies can evolve into platform providers. Second, it emphasizes that the shift to platform-oriented business models requires more than a simple adaptation of the product-oriented model, instead demanding a comprehensive organizational transformation. Finally, drawing on Pettigrew's (1988) perspective, it examines the circumstances (context) and changes (content) that automakers undergo during this transformation.

The remainder of the paper is organized as follows. Section 2 provides the conceptual background for this article. Section 3 describes the study's methodological approach. Section 4 presents its results, while Section 5 discusses the findings. Finally, Section 6 concludes the paper with its theoretical contributions, managerial implications, limitations, and opportunities for further research.

2. Theoretical background

2.1. *Servitization and digital platforms*

With the advancement of Industry 4.0, many manufacturers have begun adopting digital technologies to leverage their service offerings and support their transformation toward servitization (Favoretto et al., 2022; Frank et al., 2019). Technologies such as the Internet of Things, big data, artificial intelligence, cloud computing, and augmented reality have enabled the development of smart solutions, which integrate products, services, and software (Coreynen et al., 2017; Sklyar et al., 2019; Tronvoll et al., 2020). The provision of smart solutions is related to digital servitization, referring to the shift from product-oriented to service-oriented

business models, strongly supported by digital technologies (Paschou et al., 2020; Sjödin et al., 2020).

Digital servitization has gained renewed traction with the advent of digital platforms. These platforms enable manufacturers to integrate data from multiple connected products and convert them into actionable insights that support the provision of advanced services, such as monitoring and optimization solutions (Fu et al., 2022; Lerch et al., 2024; Van Dyck et al., 2024). Notably, digital platforms facilitate the modularization of service offerings into micro-services that can be recombined to meet specific customer needs (Cenamor et al., 2017; Rajala et al., 2019). Consequently, they enable large-scale customization of service solutions, driving operational efficiency and expanding value-creation opportunities (Cenamor et al., 2017; Eloranta et al., 2021). Furthermore, manufacturers can incorporate external contributors (e.g., application developers and software providers) to add complementary service modules and enhance the core value proposition (Beverungen et al., 2021; Kapoor et al., 2022).

Although many manufacturers are transitioning to platform-oriented business models, this transformation is not a simple adaptation of existing product business models but instead requires substantial organizational changes (Lerch et al., 2024; Van Dyck et al., 2024). Previous studies have explored how manufacturers can evolve their existing business models by incorporating service businesses (e.g., Baines et al., 2020; Favoretto et al., 2022; Tronvoll et al., 2020). In the following section, we delve deeper into the organizational changes required for servitization.

2.2. Organizational changes in servitization

Organizational change within companies unfolds through the interplay of three dimensions: (i) context, (ii) content, and (iii) process (Pettigrew, 1988). First, *context* refers to the circumstances under which change occurs, involving both internal and external drivers such as competitive pressures, technological advancements, and shifts in customer demands. Second, *content* pertains to the actual changes that take place within the company, driven by strategic decisions—for instance, shifts in intentional narratives, the reconfiguration of organizational structures, and modifications to the value proposition and organizational practices. Third, *process* describes how these changes are implemented over time, emphasizing the dynamics of transformation, key events that symbolize change, and the roles of the actors involved (Baines et al., 2020; Pettigrew, 1988). Togeth-

er, these three dimensions offer a comprehensive perspective for understanding how companies transform their business models and implement the organizational changes necessary for such transformation.

As previously mentioned, recent studies on servitization have explored how manufacturers implement organizational changes to support their servitization transformation. In this context, Baines et al. (2020) propose a transformation model that outlines the servitization journey in four predominantly unidirectional stages: exploration, engagement, expansion, and exploitation. Additionally, Favoretto et al. (2022) examine how digitalization influences the business models of servitized manufacturers, highlighting changes at the strategic, organizational, and network levels. In turn, other studies have focused on changes in organizational practices. For instance, Palo et al. (2019) identify contestation practices that support the transition from a legacy product-centric business model to an emerging service-centric model. In the same vein, Löfberg et al. (2025) demonstrate how servitization transformation can be realized or unrealized based on micro-level activities involving servitization practices, practitioners, and praxis. Furthermore, Kohtamäki et al. (2020) conceptualize coping practices that help address the paradoxes manufacturers face as they move toward servitization.

Despite these significant advances in the servitization literature, the organizational changes required to support platform-oriented business models remain underexplored (Lerch et al., 2024). Indeed, the adoption of platform logic demands more profound organizational changes, including new forms of interactions within ecosystems and new processes for service delivery (Beverungen et al., 2021; Van Dyck et al., 2024). To better understand this transition toward platform-oriented business models, we draw on Pettigrew's (1988) perspective on organizational change, with a particular emphasis on the context and content dimensions, in order to capture the circumstances surrounding change and the actual shifts occurring within manufacturers. Additionally, we investigate the automotive sector to examine how automakers are transforming their business models toward connected cars.

2.3. *Automakers' transition toward connected cars*

Leading automakers such as General Motors, Volkswagen, Hyundai, Stellantis, BMW, Honda, and Volvo, among others, have advanced digital servitization initiatives and have begun to implement new business models focused on data and digital platforms (Capgemini, 2020). Following

this strategy of moving toward new digital businesses, many automakers have begun offering connected cars (Bohnsack et al., 2021; Svahn et al., 2017). Connected cars are vehicles equipped with sensors and wireless communication technologies that collect, store, process, and analyze large amounts of information from the vehicle and the external environment, in addition to enabling the exchange of information with the network, other vehicles, mobile devices, and road infrastructure (Bohnsack et al., 2021; Buck & Reith, 2020). Building on these technologies, connected cars enable a range of services and features to improve customer driving experience, including infotainment systems, remote vehicle diagnostics, driving assistance, autonomous functions, and integration with other service providers (Athanasopoulou et al., 2019; Sterk et al., 2024).

Connected cars are increasingly gaining traction in the automotive industry, driven by technological advances such as faster internet connections, artificial intelligence, and digital platforms that process data on a large scale (Capgemini, 2020). Despite the opportunities generated by vehicle connectivity, many automakers have not been successful in managing the organizational transition from product-oriented to platform-oriented business models (Bohnsack et al., 2021; Turienzo et al., 2023). One of the reasons for the failure in this transition is the history of automakers rooted in creating and capturing value focused on the traditional manufacture and sale of vehicles. Most leading automakers have decades of experience operating the traditional business model, generating internal resistance to adopting new business models, especially those associated with new mobility solutions (Smania et al., 2023). Consequently, they have not yet been able to successfully navigate this digital environment and transform their traditional business models to take advantage of vehicle connectivity (McKinsey & Company, 2021).

Although the organizational transformation toward connected car business models and a platform logic is a delicate issue for automakers, little research has been done to map this process and identify the necessary organizational changes that support this transition. In fact, the literature lacks more in-depth investigations regarding the organizational transformation of automakers toward servitized businesses, especially in a data-driven environment (Genzlinger et al., 2020; Smania et al., 2023). Recent studies on connected cars have explored how vehicle connectivity has affected the business model of automakers and other actors in their ecosystem (e.g., Bohnsack et al., 2021; Turienzo et al., 2023). Nevertheless, the context and content of the organizational change remain unclear and require further investigation.

3. Research method

Considering that academic research on the transformation of automakers toward connected car business models is still emerging, we conducted a qualitative research using multiple case studies. This methodological approach is recommended for addressing “how” questions and exploring complex phenomena that lack sufficient theoretical grounding (Bryman & Bell, 2015; Voss et al., 2002). Furthermore, the use of multiple cases provides rich empirical insights and enhances the robustness of the findings by enabling comparative analysis across similar and contrasting cases (Eisenhardt, 1989; Yin, 2009).

3.1. *Research setting and case selection*

Case selection adhered to the principles of theoretical sampling (Bryman & Bell, 2015). The primary criterion for selecting the sample was to focus on automakers with subsidiaries operating in Brazil that had already implemented connected car projects in the country, regardless of their current stage. In addition, these companies were required to commit to the research and grant access to key informants and secondary materials, such as company reports and press releases.

Initially, we scanned the Brazilian automotive market and identified 25 potential automakers. Applying the case selection criteria, we narrowed the sample to 12 automakers that had implemented connected car business models and agreed to participate in our study. This sample size aligns with recommendations for exploratory research (Eisenhardt, 1989). Specifically, larger samples help mitigate bias and reduce the risk of selecting companies that may not represent the phenomenon under investigation. It is worth noting that although all selected automakers are Brazilian subsidiaries, many also operate in broader markets, especially in Latin America. Additionally, the Brazilian market holds strategic importance for some automakers, serving as a launchpad for connected car projects that later expand to other subsidiaries. Consequently, the companies' location does not limit the generalizability of the findings. Table 1 provides a descriptive overview of the cases.

3.2. *Data collection*

Primary data were collected through interviews with key executives from the case companies. We targeted interviewees who played

Table 1

Descriptive overview of the cases

Case	Head-quarter	Type of vehicles	Launch of connected services	Interviews / Roles / Total duration
A	Europe	Economy cars	2020	2 / Head of digital and connectivity; Senior connectivity and innovation manager / 2,5 h
B	Asia	Economy cars	2021	1 / Senior product analyst / 1,5 h
C	Asia	Economy cars	2024	1 / Product planning supervisor / 1,5 h
D	Asia	Economy cars	2022	1 / IT project leader / 1,5 h
E	Europe	Economy cars	2021	2 / Head of connected vehicles projects; Vice president of business development / 2 h
F	Asia	Economy cars	2014	1 / Product engineer / 1 h
G	Europe	Premium	2014	1 / Digital products manager / 1,5 h
H	Asia	Premium	2021	1 / Product planning manager / 1 h
I	North America	Economy cars	2018	2 / Connectivity solutions supervisor; Product planning manager / 2,5 h
J	North America	Economy cars	2015	1 / Connected operations manager / 2 h
K	Europe	Premium	2021	2 / Customer service manager; Innovation project manager / 2 h
L	Europe	Premium	2013	1 / Connected solutions analyst / 1 h

key roles in implementing new business models within the automakers and were actively involved in the introduction of connected cars and related services. Since the transformation of automakers toward new platform-oriented business models requires top-level decisions (Beverungen et al., 2021; Lerch et al., 2024; Van Dyck et al., 2024), we selected decision-makers from strategic areas who held a comprehensive understanding of organizational changes across different business units and ecosystem actors. Accordingly, we prioritized executives and managers from departments such as digitalization, innovation, product develop-

ment, and customer service. In total, we conducted 16 individual, in-depth interviews across the 12 automakers in our sample. Additionally, we collected secondary data from websites, magazines, and annual corporate reports to triangulate information and improve reliability (Miller et al., 1997). This triangulation of data sources allowed us to converge empirical evidence, thereby enhancing the quality of data collection and analysis (Lindgreen et al., 2021).

The interviews were conducted between March 2024 and January 2025 using a research script (see Appendix A for details). This script comprised open-ended questions derived from the literature on connected cars and platform-oriented business models, following a funnel approach (Patton, 2002). It began with general questions, such as identifying the interviewee and characterizing the automaker, and gradually progressed to more specific questions, such as identifying the connected services offered by the company and exploring the organizational changes required to implement new connected car business models. As the interviews progressed, we adjusted the script to incorporate insights obtained from the initial interviews. We requested permission to record each interview for transcription, which facilitated subsequent data analysis. Each interview lasted between one and two hours, resulting in over 20 hours of recorded material.

3.3. *Data analysis*

To analyze the data collected from interviews and secondary materials, we employed a thematic analysis techniques and adopted an inductive approach (Seuring & Gold, 2012), using the NVivo 11 software. Thematic analysis is particularly effective for qualitative research as it facilitates the interpretation of underlying messages, allowing for the coding and categorization of textual data into different theoretical constructs (Braun & Clarke, 2006; Gioia et al., 2013). Both authors participated in the coding process, conducting independent analyses and collaboratively discussing the final categorization to ensure investigator triangulation (Bryman & Bell, 2015).

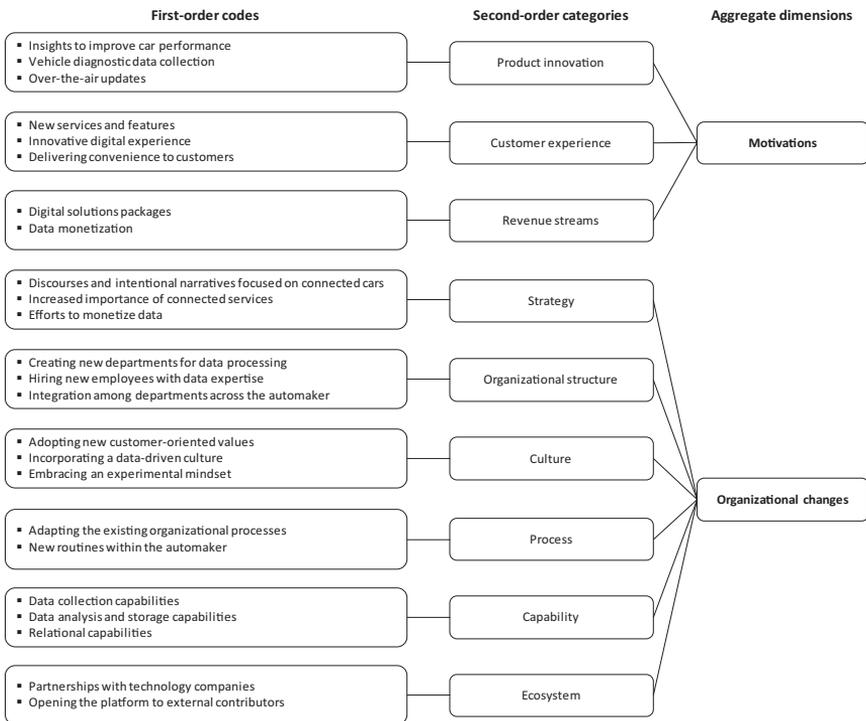
The coding process was carried out in three stages, following the guidelines recommended by Gioia et al. (2013). First, we conducted a thorough reading of the interview transcripts, field notes, and secondary materials to identify empirical evidence related to automakers' transformation toward connected car business models. Relevant text fragments referring to the context and content of the organizational transformation were coded into 24 first-order codes. These codes were subsequent-

ly grouped into nine second-order categories that shared similar ideas. Finally, we organized these second-order categories into two aggregate dimensions based on thematic similarity, which correspond to theoretically grounded constructs: (i) motivations and (ii) organizational changes. Figure 1 presents an overview of the coding structure.

4. Results

Our thematic analysis of the collected data revealed the key motivations and organizational changes in the business models of automakers following the introduction of connected cars. In the following sections, we discuss these topics in depth.

Figure 1
Coding structure



4.1. *Motivations for the transformation toward connected cars*

As automakers advance the implementation of connected cars, they aim to leverage operational and market outcomes in terms of product innovation, expanded customer experience, and new revenue streams. First, data collected from sensors embedded in connected cars provide valuable insights for automakers to better understand vehicle performance, thus enhancing their innovation capability. As a result, internal product development teams can design innovations based on actual performance metrics. As noted by the Connectivity solutions supervisor at Automaker I: *“We collect diagnostic information and fault codes. We do several analyses of the product [based on this information], regardless of whether the data is identified or not. This allows us to assess our product in terms of faults and error codes, and take appropriate action.”* Furthermore, connectivity enables automakers to perform over-the-air updates to address potential technical and software issues or to introduce new features. This functionality allows automakers to resolve problems reported by one customer before others encounter the same issues. In turn, non-connected cars require any updates to be done at dealerships; instead, connected cars allow for remote updates directly from the automaker.

Second, connectivity paves the way for offering platform services that enhance the customer experience. Following a digital transformation that extends beyond the automotive industry and embraces society as a whole, connectivity enables automakers to attract and re-engage customers through improved experiences. In this regard, the Connected operations manager at Automaker J stated: *“In the past, we were eager to get our driver’s license. Nowadays, young people do not think that way anymore. They ask, ‘Why should I own a car? There is nowhere to park. I will just take an Uber and go wherever I want.’ So, the car will increasingly become a platform for providing services rather than an asset that the customer desires to own.”* Specifically, connected cars enhance the customer experience through driving-related services (e.g., vehicle diagnostics, geolocation, and driving assistance), convenience services (e.g., 24/7 assistance, online repair and maintenance scheduling, and infotainment systems), and advanced functions (e.g., voice commands and remote control functions, such as starting the air conditioning before departure, locking/unlocking doors, and starting the engine via smartphone). In this way, automakers aim to increase customer satisfaction and remain competitive in a market that is increasingly open to new mobility solutions, such as car rentals and ride-hailing apps.

Finally, the implementation of connected cars and new, platform-oriented business models generates new revenue streams for automakers. Historically, automakers have struggled to expand their revenues beyond traditional vehicle sales, which generate lower profit margins than services. By moving into platform-oriented businesses, they can increase their profitability by selling services to customers and supplementing revenues from traditional vehicle sales. On the one hand, automakers can monetize services within the platform and create digital solution packages for customers. For instance, Automaker J has four different plans for its platform, ranging from the standard plan (which includes basic features, such as vehicle diagnostics, alerts for irregular vehicle conditions, and online maintenance scheduling) to the most advanced plan (which brings together all the features included in the other packages). Alternatively, automakers can monetize the data collected from connected cars, for example, by selling driver behavior information (e.g., data on speed, acceleration, braking, and accident history) to insurers, who then provide more customized insurance solutions to customers. Consequently, one of the main motivations for automakers to move toward connected cars is the potential increase in financial outcomes.

4.2. Organizational changes supporting the transformation toward connected cars

Organizational changes in automakers' business models following the introduction of connected cars span across six key dimensions: (i) strategy, (ii) organizational structure, (iii) culture, (iv) process, (v) capabilities, and (vi) ecosystem. In the following sections, we discuss each dimension in detail.

4.2.1. Strategy transformation

Connectivity has increasingly shaped automakers' strategies, prompting these companies to place greater importance on the provision of connected services associated with their vehicles. According to our interviewees, automakers have started to emphasize connectivity and digital services in their discourse and intentional narratives across the organization, underscoring how connected cars and data-driven business models have become central to their strategic focus. However, despite the influence of connectivity on their strategies, many automakers continue to struggle with monetizing data, capitalizing on connected services, and

effectively capturing value from this platform-oriented business model. In particular, many automakers face difficulties in designing appropriate service packages and setting prices accurately. The Head of digital and connectivity at Automaker A elaborated on this: “*We [automakers in general] may implement connected cars, but we currently lack a clear vision for monetizing the data collected from vehicles.*” Consequently, the strategic transformation toward connected cars remains a challenge for automakers.

4.2.2. Organizational structure transformation

The successful implementation of new platform-oriented business models requires a reconfiguration of automakers’ organizational structure. Specifically, new departments for software development and data analysis must be created, as highlighted by the Connectivity solutions supervisor at Automaker I: “*We have created structures to support this new business model. My area is one of them; there was no connectivity engineering [area] before, nor a software development team. These two areas certainly did not exist before.*” To enable this transformation, automakers have begun hiring new employees with expertise in software, data science, and digital technologies. The Vice president of business development at Automaker E elaborated on this: “*Recently, we have been hiring many software engineers and employees from technology companies. We no longer recruit [employees] from other automakers. The people hired recently for the software area are former employees of Apple, Google, and other technology giants.*” However, merely establishing new connectivity-related departments does not automatically ensure the success of the business model transformation. Implementing models centered on connected cars requires strong integration between these new departments (e.g., software development and data analysis) and traditional teams (e.g., product development and industrial engineering). These groups must work collaboratively to materialize new platform-oriented business models.

4.2.3. Culture transformation

Cultural transformation plays a key role in enabling manufacturers to successfully deliver integrated solutions of products, services, and data, primarily through the incorporation of customer-oriented values. In the context of platform-oriented business models, especially for connected

cars, automakers must incorporate a data-driven culture and embrace an open, experimental mindset similar to that of startups. Although cultural change poses a challenge for the introduction of platform-oriented business models in the automotive industry—given that large automakers typically have values rooted in industrial and manufacturing processes—the shift to connected cars requires an organizational culture centered on data, software, and digital services. Reflecting on this point, the Product planning supervisor at Automaker C remarked: *“Our company has adopted the methodology of ‘fail, but fail fast and correct quickly.’ So, when we develop an innovation, we design it rapidly and test it. If it shows potential, we refine it. Thus, these concepts, more common in the software environment, are being integrated into our culture.”* Therefore, an organizational culture resembling that of digital startups must be incorporated by automakers to support this transformation.

4.2.4. Process transformation

The implementation of connected cars and new platform-oriented business models also requires changes in automakers’ existing product development, manufacturing, sales, and service processes. Our empirical evidence highlights that connectivity has transformed routines within automakers. In this sense, these companies have transformed their work practices to take advantage of digitalization and support new digital solutions, as noted by the Connected operations manager at Automaker J: *“Today, at Automaker J, we no longer discuss anything that is not related to the use of vehicle data [...] In the past, when a customer scheduled [an overhaul] and arrived at the dealership, our employee would check all the vehicle information, including mileage, fuel levels, etc. Nowadays, when the customer drops off the car, we already have mileage, fuel status, and error codes. If a customer has scheduled an overhaul and there is a fault code, our employee can pre-order the part and expedite the maintenance.”* Therefore, existing organizational processes must be adapted to align with this new digital environment in automakers.

4.2.5. Capability transformation

Success in implementing connected cars requires developing new capabilities and competencies more adapted to a digital, data-driven environment. First, automakers must develop data collection capabilities to gather data on the vehicle and its surrounding environment with accuracy,

consistency, and integrity. Specifically, they need to invest in embedded smart components—such as IoT sensors, onboard computers, and artificial intelligence tools—that generate vehicle usage data and transmit it to centralized systems via wireless communication networks. These smart components generate vast amounts of data, averaging 30 gigabytes per day. Consequently, a second critical requirement for automakers is the ability to store and analyze data. Technologies such as big data analytics tools can help automakers efficiently process large volumes of data and extract actionable insights to create value. Finally, automakers must develop relational capabilities, particularly in building trust with customers to access vehicle data and mitigate privacy concerns. Since connectivity grants access to extensive amounts of sensitive driver data—such as location, routines, and behavior—relational capabilities are crucial for customers to feel confident in entrusting their data to automakers.

4.2.6. Ecosystem transformation

Although large automakers are shifting toward platform-oriented businesses and connected cars, they do not yet possess all the necessary resources, technologies, and capabilities to effectively provide new services and features to customers. Additionally, many of these services fall outside the core business of automakers—in essence, they largely remain industrial manufacturers. For this reason, they must reconfigure their ecosystems to include new actors that may seem unrelated to the automotive industry, such as technology giants, telecommunications companies, autotechs, and app developers, to bridge gaps in digital knowledge and capabilities. To illustrate, Automaker K has transformed its connectivity services into an open platform that allows third-party developers to design and integrate new apps and services into the car's multimedia center. By opening the boundaries of their ecosystems to these actors, automakers enable external contributors to expand the service portfolio and enhance the platform's core value proposition, thereby increasing the value of connected cars to customers. The goal of these ecosystem transformations is to provide drivers with greater convenience and novel experiences by co-creating value with a broad range of partners to develop new products and services.

5. Discussion

Our findings reveal two main axes that characterize the transformation of automakers from traditional product manufacturers to platform pro-

viders through the introduction of connected cars. The first axis concerns the strategic motivations driving this transition. Previous studies (e.g., Genzlinger et al., 2020; Smania et al., 2023) have already highlighted how automakers are shifting toward new service-oriented business models to generate economic value and expand market reach. Our findings build on this by showing that the adoption of digital business models can deliver three key benefits: enhanced product innovation, improved customer experience, and diversified revenue streams. The adoption of connected cars enables real-time data collection, which fuels more agile and user-driven innovation processes, allowing automakers to tailor products based on actual usage patterns. Furthermore, the development of personalized digital services, such as predictive maintenance, infotainment, and usage-based insurance, plays a critical role in enhancing the overall customer experience (Bohnsack et al., 2021; Turienzo et al., 2023). These services not only foster deeper customer engagement and brand loyalty but also open up new monetization opportunities through subscription-based models or partnerships with third-party providers (Sterk et al., 2024).

The second axis refers to the organizational changes needed to enable the transformation toward platform-oriented business models. Our findings align with those of Favoretto et al. (2022) and Raddats et al. (2019), uncovering interdependent changes across six organizational dimensions necessary for new digital models: strategy, organizational structure, culture, processes, capabilities, and ecosystem. First, the strategy dimension underscores how digital technologies and connectivity call for new visions centered on services and data, reshaping the strategic focus of manufacturers—especially automakers (Ardolino et al., 2018). Second, changes in organizational structure emphasize the need to establish new functional areas dedicated to digital initiatives and to enhance interdepartmental collaboration (Favoretto et al., 2022). Third, platform-oriented business models require cultural shifts toward a digital mindset that embraces experimentation and fosters discovery (Tronvoll et al., 2020). Fourth, business processes are also reshaped by connectivity and platformization, requiring manufacturers to adapt organizational practices to support new tasks related to data management, service design and delivery, and software development (Genzlinger et al., 2020; Paiola & Gebauer, 2020). Fifth, platform models necessitate new capabilities, including the development of innovative technologies and the cultivation of trusting relationships with customers and other partners—capabilities that are critical for both traditional and digital servitization (Ardolino et al., 2018; Favoretto et al., 2022). Lastly, the ecosystem logic becomes increasingly important

with the rise of connectivity, digitalization, and platform models, as connected services require manufacturers to reconfigure their value chains and build partnerships with multiple, interdependent actors (Sklyar et al., 2019). Accordingly, these findings highlight the multidimensional nature of the transformation toward platform-oriented business models.

6. Conclusions

The aim of this study is to better understand the organizational transformation that automakers undergo to adopt platform-oriented business models, particularly those involving connected cars. To achieve this, we conducted a qualitative research based on multiple case studies, drawing on data from 12 automakers in the Brazilian automotive industry that have advanced toward connected car business models. Based on Pettigrew's (1988) perspective, we identified three primary motivations driving the transformation of the automakers' business models toward connected cars, as well as six key organizational changes that support this shift. Through this analysis, we offer both theoretical and managerial contributions.

6.1. *Theoretical contributions*

The study contributes to the platform and servitization literature in three key ways. First, we extend prior research (e.g., Fu et al., 2022; Markfort et al., 2022; Van Dyck et al., 2024) by examining how traditional product companies—specifically automakers—are transitioning to platform-oriented business models through the implementation of connected cars. With the evolution of the automotive industry, automakers have begun offering innovative mobility solutions to appeal to a new wave of customers who no longer view cars as assets of the same value as in the past. A prominent trend within the industry is the rise of connected cars, through which automakers and other service providers now offer new digital solutions and features designed to enhance the driving experience, thus reigniting customers' motivation to purchase cars. Our findings shed light on this evolution within the automotive sector, illustrating how automakers are moving toward platform-oriented business models.

Second, prior studies have highlighted that many industrial manufacturers have struggled to implement platform businesses and have failed to fully capitalize on the benefits of platformization (Jovanovic et al., 2022; Lerch et al., 2024). A key factor contributing to the failure of platformiza-

tion strategies is the inability of manufacturers to establish the necessary organizational changes to support this transformation. Our study adds to this discussion by underscoring that the transition to platform-oriented business models is a complex endeavor, requiring a comprehensive organizational transformation rather than a simple adaptation of the existing business model.

Third, drawing on Pettigrew's (1988) framework, we investigate the transformation of automakers from product manufacturers to platform providers by analyzing both the context and content of organizational change. This perspective allows us to uncover the main motivations behind the shift to platform-oriented business models centered on connected cars, as well as the major changes in strategy, organizational structure, culture, processes, capabilities, and ecosystem that support this organizational transformation. These findings extend previous studies on digital servitization (e.g., Favoretto et al., 2022; Tronvoll et al., 2020) by showing how platform logic shapes the transition of automakers toward service-oriented business models.

6.2. *Managerial implications*

From a managerial perspective, we offer two key implications. First, our findings can help managers recognize the primary motivations behind the transformation from products to platforms, particularly by highlighting the potential benefits of adopting connected cars and related services. Specifically, connected cars represent a strategic opportunity to collect data that can be transformed into actionable insights for product innovation, allowing automakers to enhance the functionality and adaptability of existing vehicles. Moreover, vehicle connectivity can significantly improve the overall customer experience by enabling the delivery of personalized, vehicle-related services and features, thereby fostering stronger customer engagement and long-term loyalty. Finally, this transformation opens up new revenue streams beyond traditional vehicle sales, supporting more resilient financial performance, especially during periods of market volatility or declining car sales.

Second, we highlight the organizational changes necessary to support the transformation toward platform-oriented business models. For automakers aiming to become platform providers, this transition involves more than a simple organizational adjustment or a modification of the existing business model; instead, it demands coordinated shifts across multiple or-

ganizational dimensions. In terms of strategy, we recommend that managers develop a clear, service- and digital-oriented vision, establishing strategic priorities that articulate how connected services and data contribute to business performance. Regarding organizational structure, the traditional product-centric structure should be adapted to accommodate cross-functional teams and to create new departments focused on data, software, and service development. Regarding the culture dimension, we suggest promoting values that encourage experimentation and foster a digital mindset throughout the organization. In terms of processes, internal routines must be redesigned to support data management and service delivery practices. Related to capabilities, managers should recognize the need to build both digital (e.g., data analytics and cybersecurity) and relational (e.g., customer engagement and trust-building) competencies to enable successful service provision. Finally, at the ecosystem level, it is crucial to develop strategic partnerships with technology suppliers, startups, service providers, and software developers to overcome technological limitations and co-develop new features for connected cars. Accordingly, practitioners within automakers can use our insights to redesign their business models and navigate an increasingly digitalized, data-driven environment.

6.3. *Limitations and further research*

Despite its theoretical and practical contributions, this study has limitations that suggest opportunities for further research. First, while it explores similarities across 12 automakers, it does not provide detailed insights into the organizational changes of individual companies. Future studies could build on our findings by examining specific cases in greater depth, considering their idiosyncratic contexts. Second, it considers automakers at different stages of platformization, reflecting the varying timelines of connected car implementations across companies. Future research could address this limitation through comparative analyses of companies at different maturity levels to better understand the nuances of organizational transformation. This also invites reflection on how organizational transformation frameworks might align with or be enriched by maturity-level perspectives on servitization and platformization. Third, our results reveal that this shift extends beyond the boundaries of individual manufacturers, requiring an ecosystem transformation. Future studies could explore in greater depth the ecosystem transformation and incorporate the perspectives of multiple actors involved in this organizational change. Finally, while Pettigrew's (1988) framework provided a useful

lens for investigating the context and content of organizational change, our findings point to complexities that may not be fully captured by the original model. This opens space for future research that revises or expands Pettigrew's (1988) framework.

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Appendix A. Interview script

Table A – Questionnaire

Topic	Questions
(1) Interviewee's profile	<ul style="list-style-type: none"> • What is your current position within the company? • How long have you been working at the company? • What is your role in the development and implementation of connected cars within the company?
(2) Company's profile and connected cars	<ul style="list-style-type: none"> • When did the company begin implementing connected cars in Brazil? • What motivated the company to implement connected cars? • Do all current car models include vehicle connectivity? If not, which ones do? • What (financial and non-financial) outcomes has the company observed from the introduction of connected cars?
(3) Connected services	<ul style="list-style-type: none"> • What types of connected services does the company offer? <ul style="list-style-type: none"> ◦ Driving-related services (e.g., vehicle diagnostics, geolocation, driving assistance)? ◦ Convenience services (e.g., 24/7 assistance, infotainment systems, online maintenance scheduling)? ◦ Advanced functions (e.g., voice control and remote control)? • How are these services offered to customers? Does the company offer subscription plans? If so, can these plans be customized? • What channels does the company use to deliver connected services? • How does the company collect and use data generated by connected cars?

Topic	Questions
(4) Organizational changes	<ul style="list-style-type: none"> • What organizational changes were needed to support the transformation toward connected cars? • How has the company's strategy been adapted to support this transformation? What actions are planned in the coming years as part of the ongoing strategic shift? • What changes were necessary in the organizational structure? Which departments were involved? Were any new areas or departments created? What structural changes are planned for the near future? • Did the organizational culture need to be adapted to support the shift to connected cars? What cultural aspects still need to be reinforced to promote vehicle connectivity and new digital business models? • What changes have been made to the company's processes (e.g., service development, sales, and delivery)? What additional changes are still required? • Were new capabilities required to support the transition to connected cars? What new competencies and resources still need to be developed? • How has the transformation toward connected car business models affected relationships with customers, suppliers, and other partners? What new actors have joined the company's ecosystem?

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