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The development of subscription car service in Brazil

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Abstract: Car subscription services in Brazil are offered both by vehicle manufacturers and independent rental companies (IRC). This study aims to structure the car subscription business model provided by vehicle manufacturers in Brazil using an exploratory-qualitative approach. The research involved participation from subscription program managers and car rental industry experts. The obtained results encompass the characterisation of the car subscription service and market in Brazil. Additionally, driving factors and barriers for the development of this business model were identified. Subsequently, the results were analysed and integrated into a new framework for the business model. These findings contribute to expanding the understanding of business models based on digital servitisation and provide insights for further research. The conclusions emphasise that the car subscription service in Brazil is on an upward trajectory; however, it still requires updates and adaptations to fully meet the demands of the consumer market.

Keywords: business model; digital servitisation; automotive sector; car subscription; Brazil.

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1 Introduction

The automotive sector is undergoing a transformation driven by trends such as electrification, shared mobility, automation, sustainability, and digitisation. Consequently, new mobility business models (MNs) are emerging as alternatives for companies to meet the growing demand for products and services aligned with this new landscape. Among these new mobility business models is the car subscription service. The subscription economy is revolutionising various markets through digital businesses. The growth of subscription-based models is attributed to the increasing online presence in contemporary society, appealing not only to younger age groups.

Subscriptions are defined as contracts for the temporary or unlimited transfer of goods in exchange for regular payments, in which the customer receives a fixed scope of service at an established price, paid during the contract (Kalka and Leven, 2020).

Car subscription services in Brazil are offered both by vehicle manufacturers and independent rental companies (IRCs). The offerings encompass concepts derived from the sharing economy (SE), the servitisation of industrial companies, and the digitisation of business models. The SE refers to the confluence of three broader socioeconomic developments: access over ownership or access-based consumption, peer-to-peer or peer-to-peer (P2P) economy, and allocation of idle resources or collaborative consumption (Frey et al., 2019).

The SE is a trend driving the emergence of service offerings to meet the demand from a market segment that prefers usage over ownership. The shift in consumer culture from vehicle ownership to usage provides manufacturers with new revenue-generating alternatives.

The process of servitisation in the industry is characterised by the transformation of MNs focused on tangible goods production into product-service systems. Digitisation serves as an important facilitator for offering intelligent services, bringing manufacturers closer and increasingly interacting with the consumer market.

In the case of offering car subscription services, there have been no studies conducted on its structure or design. In fact, few research studies have been published on this business model. The structuring of car subscription services arises from the need to understand the offering and analyse the changes in vehicle access processes. Previously, consumers had to go directly to a dealership to acquire a vehicle; however, with the emergence of new MNs based on the SE, the logic of commercialisation and the product lifecycle have changed. In this sense, this study focuses on digital servitisation in the automotive sector, specifically on car subscription services. The main objective was to structure the car subscription business model offered by vehicle manufacturers in Brazil.

The main results found were:

- 1 identification of the essential components of the car subscription business model
- 2 comprehension the driving factors and barriers impacting the development of this service
- 3 characterisation of the operationalisation of the business model in question
- 4 analysis of the car subscription market in Brazil
- 5 structuring of the car subscription business model offered by manufacturers in Brazil.

Furthermore, this study contributes to an understanding of the car subscription business model and can assist further research on the topic. Additionally, it provides an opportunity for reflection for managers, allowing an analysis of the paths to be taken and the challenges organisations face when offering business models based on intelligent product-service systems. The study's structure follows the usual sequence, including theoretical support, methodological procedures, presentation, and discussion of collected results, conclusions, and final considerations.

2 Literature review

The development of services is an alternative for companies to remain competitive in the market and expand their market share (Vendrell-Herrero et al., 2022). The movement towards servitisation has coincided with the advent of digitisation, with manufacturers aligning their business models towards intelligent digital systems (Lerch and Gotsch, 2015). In this context, digitisation stands out as one of the key facilitators (Kohtamäki et al., 2019; Genzlinger et al., 2020; Calabrese et al., 2022).

Servitisation is the process of transforming a business model and logic centred on tangible goods to a service-centred model (Kowalkowski et al., 2017). Digital servitisation (DS) is defined as the transition to intelligent systems of tangible service goods, which enable improvements in value creation and capture (Kohtamäki et al., 2019). This process seeks to reconfigure business processes, resources, products, and services to improve value for customers and increase the company's financial and non-financial performance (Favoretto et al., 2022). The advantages of DS include greater customer understanding through sophisticated data analysis, better market positioning through digital innovation, and greater creative capacity with advanced technology (Minaya et al., 2024). Digital technologies such as internet of things (IoT), analytics, and artificial intelligence are important for servitisation as they enable smart products to use feedback loops to monitor ongoing performance and usage (Kavanaugh et al., 2023).

The servitisation process is also taking place in the automotive sector. For many people, owning, driving, and acquiring a vehicle is a matter of pride (Moody and Zhao, 2019, 2020; Zhao and Zhao, 2020). However, the context reveals a decline in demand for personal cars, accompanied by the rise of large fleet services such as car subscriptions (Koroth et al., 2019).

The industry has added product-oriented after-sales services to increase customer value, generate more revenue, and allow customers to get closer to manufacturers (Genzlinger et al., 2020). Some changes are related to the relationship between customers and cars, the degree of innovation of business models, and the product life cycle. Changes in customer relationships and interactions are noted throughout the product life cycle.

Subscriptions are defined as contracts involving the temporary or unlimited transfer of goods in exchange for regular payments. In this context, the customer receives a fixed scope of service at a predetermined price, paying during the contract period (Kalka and Leven, 2020). The payment covers not only the car itself but also includes taxes, insurance, maintenance, and ancillary expenses. Importantly, depending on the program, consumers have the flexibility to cancel or switch vehicles (Kalka and Leven, 2020; Joast and Deinlein, 2019; Stuchlik, 2021).

According to Freed et al. (2022), the primary distinction between a rental and a subscription lies in the binding nature of the contract. With a subscription, the buyer has the prerogative to cancel the service at any time, with few or no consequences. Car subscription services reflect the trend towards replacing ownership with access (Joast and Deinlein, 2019). This approach aligns with the profile of consumers who rely on and/or prefer internet-based services, opting to acquire a car or choose mobility solutions through mobile devices (Koroth et al., 2019).

Car subscriptions represent a relatively new approach, characterised as a digital business model, as discussed by Schuh et al. (2020), playing a significant role in monetising tangible goods and services, providing revenue-generating opportunities (Schuh et al., 2019). This model piques the interest of automotive industry managers, as its impacts and disruption potential are largely unknown (Stuchlik, 2021).

Szamatowicz and Paundra (2019) outline some distinctive characteristics of car subscription services: a) Subscription contracts incorporate costs such as insurance and maintenance, often offering door-to-door services; b) They allow users the flexibility to switch vehicles, a benefit uncommon in leasing and rental services; and c) They enable frequent use with friends and family. Kalka and Leven (2020) highlight the main perceived advantages for users related to provider responsibility, which can be the manufacturer or a third party, assuming maintenance and repairs, and flexibility for short-term cancellations. Freed et al. (2022) cite immediate access to tangible goods or services with lower short-term investments as an advantage (Freed et al., 2022).

Car subscriptions not only benefit user drivers but also play a significant role in improving urban mobility (Koroth et al., 2019). They become an integral part of the local transportation system, thus expanding availability and interconnectivity between different modes (Shaheen and Cohen, 2013). Additionally, the growth of the subscription economy is advantageous for offering companies (Freed et al., 2022). For these companies, the service not only enhances customer relationships, but also provides more direct access, generating enhanced returns and reducing dependence on external partners (Kalka and Leven, 2020; Suryakala, 2019).

In Germany, forecasts indicate good market potential for car subscriptions (Kalka and Leven, 2020). Projections consider this model a strong trend, which could represent up to 20% of market shares by 2030, surpassing outright purchases and aligning with leasing (Stuchlik, 2021).

Table 1 Car subscription programs in operation in Brazil

<i>Automobile industry</i>	<i>Program</i>	<i>Launch</i>
Audi	Audi Luxury Signature	2020
CAOA Chery	Caoa Sempre	2021
FIAT/JEEP	Flua!	2020
Ford	Ford Go*	2021
Mitsubishi	MIT Sigtature	2021
Nissan	Nissan Move	2022
Renault	Renaut On demand	2020
Toyota e Lexus	Kinto**	2021
Volkswagen	Sign and Drive	2020

Note: *Pickup trucks, vans, and larger models.

The willingness to adopt mobility services in the Netherlands is influenced by sociodemographic characteristics, while the willingness to pay for different mobility services within subscriptions varies greatly between individuals (Bahamonde-Birke et al., 2023). In India, willingness, affordability, location and experience are important factors (Chaudhuri et al., 2022).

In Brazil, the offering of this service demonstrates a growth of 31.2% in 2023, according to Mobilidade Estadão (2023), and has become a significant bet for manufacturers. Table 1 provides a detailed overview of the subscription programs offered by vehicle manufacturers in Brazil.

Car subscriptions represent a new service model, still in its early stages, with ample room for improvements. If these programs follow the example of streaming services, they may require time to consolidate and mature as a business along this path.

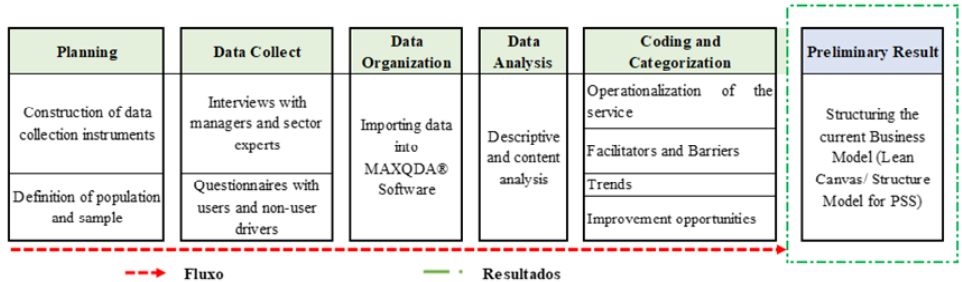
3 Materials and methods

In the effort to conduct a comprehensive, intentional, and systematic investigation with the purpose of achieving generalisations and providing a detailed description and understanding of a social area, an exploratory-qualitative approach was chosen (Stebbins, 2001).

Qualitative research typically results in a significant amount of data, much of which is characterised by its descriptive nature in early stages, where the researcher often seeks to extract an understanding of key patterns or themes (Webley, 2010). In this method, data are employed to guide interpretation, generate, and validate propositions, as well as formulate new research questions (Haven and Van Grootel, 2019).

The methodological procedures of this research outline methods and techniques that were unfolded in parts to facilitate its evolution. Thus, the study underwent five distinct stages: planning, data collection, data organisation, data analysis, and evaluation and consolidation of the model (see Figure 1).

Figure 1 Study development path (see online version for colours)



The data collection procedure adopted involved semi-structured interviews conducted with managers and industry experts from 5 April to 13 June 2023. To measure the number of users of car subscription services and people working in the service, it was decided to choose a brand, schedule an interview with one of the managers and, from there, more precisely determine the population and sample of managers to be interviewed

and users of the service. This interview served as a pre-test, confirming the idea of the interview script.

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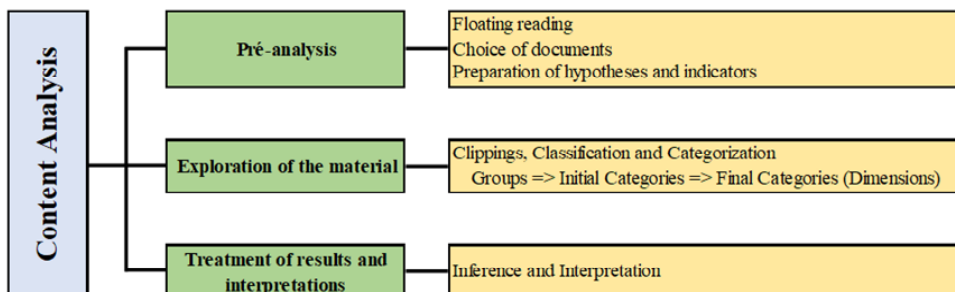
It was decided thirteen interviews with managers of nine subscription programs, covering eleven brands. The interviews were divided into four main parts: Characterisation of the interviewee and the subscription program; market; opportunity for improvement and view of the manager as a user.

Predominantly, the participants are male, representing a variety of roles including managers, directors, and professionals in marketing, sales, after-sales, and data analysis specialists. It is worth noting the significant industry experience of the interviewees, ranging from 16 months to 25 years. The interview process resulted in a substantial amount of data, which was imported, analysed, and synthesised.

The interview questions followed a predefined script, and terminologies related to customer value structure were guided by the model proposed by Moro et al. (2022). The interview results underwent content analysis using Maxqda Version 22.2.8® software. The content analysis followed Bardin's guidelines (Bardin, 2016), as depicted in Figure 2, and was divided into three distinct parts:

- 1 pre-analysis
- 2 material exploration
- 3 treatment of results, inferences, and interpretations.

Figure 2 Content analysis development (see online version for colours)



Source: Adapted from (Bardin, 2016)

Regarding the interviews, the data was incorporated into the system, and each interview was identified chronologically using alphabet letters. Thus, the first interviewed manager was designated as 'Interview A', the second as 'Interview B', and so on until 'Interview P.' Within the system, interviews were subdivided into codes or analytical categories,

allowing for the segmentation of managers' statements and extraction of key points related to the business model, market, user profile, and trends.

Through a review of studies and publications on car subscription services, propositions were formulated for each component of the business model, as detailed in Table 2. During the analysis of results, these propositions were tested and either confirmed or refuted.

Table 2 Propositions for analysis of the excellence project

<i>Business model component</i>	<i>Propositions</i>	<i>Authors</i>
P1: Customer Segment	The target audience comprises individuals aged between 18 and 25, holders of a driver's license and residents of large urban centres.	Zhong and Lee (2017), Szamatowicz and Paundra (2019), Kalka and Leven (2020), and Freed et al. (2022)
P2: Use or purpose	Work, leisure and travel.	Joast and Deinlein (2019), and Vendrell-Herrero et al. (2022)
P3: Problem	People want to enjoy a car without having to buy one.	Koroth et al. (2019), Bayart et al. (2020), and Zou and Cirillo (2021)
P4: Gains and benefits	The convenience of a private vehicle without the obligations; more flexible business model compared to rental services.	Joast and Deinlein (2019), Szamatowicz and Paundra (2019), Schuh et al. (2019), Kalka and Leven (2020), Stuchlik (2021), and Freed et al. (2022)
P5: Value proposition	The main value delivered to the consumer is convenience.	Smania et al. (2023)
P6: Solution	The solution is subscription car service.	Szamatowicz and Paundra (2019), Stuchlik (2021), and Freed et al. (2022)
P7: Value Drivers	Digitalisation; people; ecosystem; pro-servitisation culture; organisational structure; tangible goods and services; innovation.	Raddats et al. (2015), Kolagar et al. (2022), Sjödin et al. (2022), Chuang and Chen (2022), and Flores-García et al. (2023)
P8: Competitive advantage	Differentiation.	Kapoor et al. (2022)
P9: Key features and capabilities	People; digitisation; capital; collaboration; relationship with the market; innovation; development of supply, capture, and value architecture processes.	Raddats et al. (2015), Tronvoll et al. (2020), Kohtamäki et al. (2020), Hidalgo-Carvajal et al. (2021), and Krämer et al. (2022)
P10: Key activities	Develop pro-servitisation culture; interaction with the customer (co-creation); data management; innovation; inter-organisational and intra-organisational relationships; cost structure; value proposition.	Coreynen et al. (2017), Tronvoll et al. (2020), Sjödin et al. (2020), Mishra et al. (2021), and Ferreira et al. (2022)
P11: Key partnerships	Suppliers; partners; consumers; government; educational institutions; competitors; companies in the same group.	Szamatowicz and Paundra (2019), Stuchlik (2021), and Freed et al. (2022)

Table 2 Propositions for analysis of the excellence project (continued)

<i>Business model component</i>	<i>Propositions</i>	<i>Authors</i>
P12: Main operational processes	The communication channels used are digital platforms.	Szamatowicz and Paundra (2019), Stuchlik (2021), Freed et al. (2022), and Moro et al. (2022)
P13: Customer relationship	Interaction with consumers/users only occurs during contractual agreements and/in case of questions and complaints.	Szamatowicz and Paundra (2019), Stuchlik (2021), and Freed et al. (2022)
P14: Cost structure	The cost structure is formed by the CAC – customer acquisition cost, which will be made up of marketing, platform, administrative (contracts) and personnel.	Szamatowicz and Paundra (2019), Stuchlik (2021), and Freed et al. (2022)
P15: Revenue stream	Revenues are generated from the signing of contracts for the use of a car for a specific period.	Szamatowicz and Paundra (2019), Stuchlik (2021), and Freed et al. (2022)
P16: Generation of additional value in the network	Circular economy; reverse logistic; compliance; support for social projects or programs.	Szamatowicz and Paundra (2019), Stuchlik (2021), Freed et al. (2022), and Moro et al. (2022)

4 Business model operationalisation

In terms of the operational mode of the car subscription service, aspects related to the workforce, key processes, and the customer journey for service contracting were analysed. The focus was on obtaining information not available on digital platforms.

Teams and service operationalisation

The teams are lean, ranging from 20 to 40 people, including management, finance, marketing, sales, and logistics departments. Each program has its specific characteristics and relies on support from third-party companies, mainly for logistics processes.

Regarding internal processes, although the programs have distinct characteristics, they share operational similarities. Companies were established, especially linked to the financial institutions of the organisational group. Therefore, the subscription program functions as an independent vehicle rental company from the manufacturer, with its own taxpayer ID (CNPJ) and guidelines. It operates similarly to an independent vehicle rental company, leveraging the internal supply chain and business group partners of the automaker to operate.

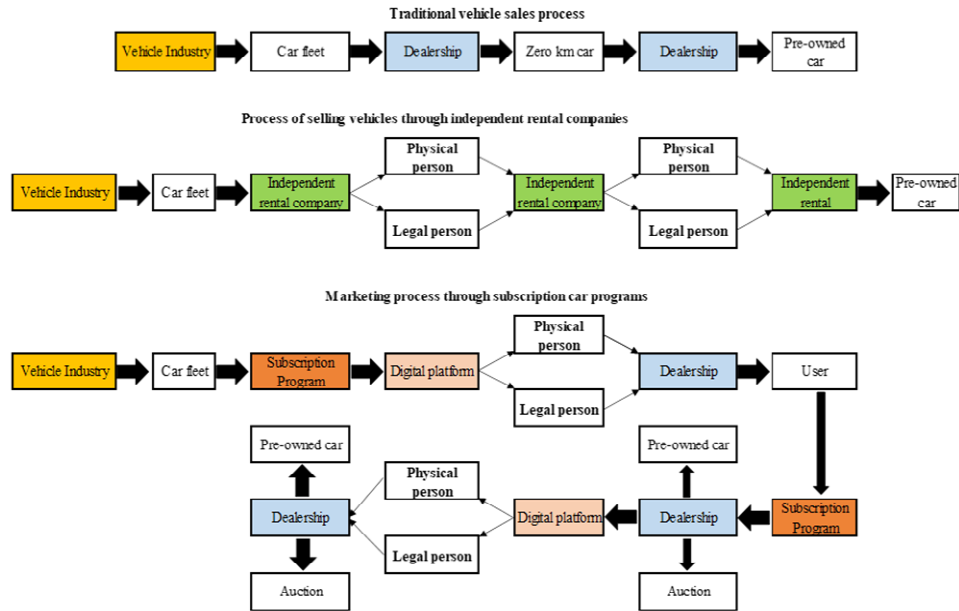
Analysing the differences between the traditional business model, vehicle leasing through IRCs, and vehicle leasing through subscription programs reveals significant discrepancies (see Figure 3). In the traditional flow, fleets are acquired directly by the automaker's dealership networks, sold as new vehicles, and may later return for resale as used vehicles.

In leasing through IRCs, fleets are acquired by these companies and made available for short or long-term rental to individuals or businesses. Vehicles, after a period of use,

are sold as used vehicles by the rental companies themselves. The commercialisation flow through subscriptions differs slightly because the customer journey is digital, both for individuals and businesses. Corporate subscription plans with large vehicle fleets require more customisation and are handled by specialised consultants.

As shown in Figure 3, subscription programs acquire fleets directly from the factory and make them available through digital platforms. With the customer digitally signing the contract, cars are sent to the customer's chosen dealerships for delivery. After the contract ends, the lessee's interest in purchasing the vehicle or subscribing to a new model is evaluated. In case of return, the car is made available to the automaker's rental company, can be rented again as a used vehicle via digital platform, purchased by the dealership for resale as a used vehicle, or sold through the manufacturer's auction.

Figure 3 Vehicle commercialisation – differences between business models (see online version for colours)



It is important to highlight that the mentioned options represent the possibilities offered by subscription programs. It should be noted that currently, only one brand offers the option of subscribing to used vehicles.

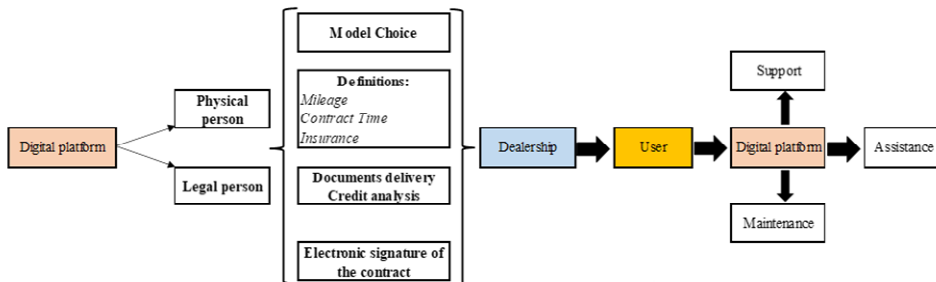
Customer journey for car subscription service contracting

The customer journey is predominantly digital, and even those who choose to visit the dealership are directed to the online platform. The visual representation of this journey can be seen in Figure 4. The process begins when the customer accesses the subscription program's website, where crucial information such as available plans, vehicle models, benefits, requirements, and other program features are found.

Upon defining the type of contract (individual or corporate), the customer selects the desired car model and establishes details such as contract duration, mileage, and

insurance specifications. Next, the required documents are provided by the customer, and they choose the dealership for vehicle pickup.

Figure 4 Car subscription customer journey (see online version for colours)



Customer interactions such as handling claims, scheduling maintenance, and addressing inquiries are conducted through the digital platform. Contractual questions and information should be clarified directly with the subscription programs. The corporate customer journey follows a similar logic, although programs dealing with a larger number of vehicles offer more personalised service.

In general, subscription programs operate in a similar manner. However, in two of these programs, the offering is tailored to leverage the variety of services offered by the brand. For example, one of the programs allows users to subscribe and include short-term car-sharing services for a brief period at no additional cost.

Next, we will present the key findings, followed by an in-depth discussion of the results.

5 Results

To structure the car subscription business model offered by vehicle manufacturers in Brazil, interviews were conducted with the purpose of collecting information on:

- 1 characterisation of the car subscription service
- 2 consumer market
- 3 service quality management
- 4 sustainable principles
- 5 digitalisation
- 6 value drivers.

This chapter also presents a synthesis of the main findings and the structure of the car subscription business model offered by manufacturers in Brazil, in Sections 5.8 and 5.9, respectively.

5.1 Characterisation of car subscription programs

With the aim of deepening the understanding of car subscription programs, efforts were made to evaluate the perspective of managers and experts regarding the concept of this service, understand the motivations of vehicle manufacturers for adopting servitisation, and examine the operationalisation of the business model.

5.2 Car subscription concept

The analysis of the car subscription service concept aimed to capture the perspective of managers, highlighting distinctions especially in relation to other business models such as leasing and rental. The most used term to characterise the service was ‘long-term rental’, as the understanding is that the subscription service currently offered by manufacturers and IRCs resembles fleet outsourcing services for businesses. The main discrepancies from other business models lie in the comprehensive service package, which includes contract terms, documentation, taxes and fees, maintenance, and insurance. Additionally, in the subscription context, it is emphasised that the vehicle is owned by a company affiliated with the manufacturer’s business group. The choice of the term ‘long-term rental’ by six interviewees is justified by its ease of communication and understanding in the market. However, two managers expressed concern that this term, while facilitating marketing, could lead to confusion among customers and partners.⁰

5.3 Motivation for car subscription programs

It is worth highlighting the various trends that encouraged automakers to develop business models based on servitisation. These trends include the SE, automation, electrification, digitalisation (connectivity) and changing user behaviour, especially among young people, where ownership is gradually replaced by access. The analysis of these trends by managers is in line with research on the direction of the automotive sector, showing that the subscription car service was conceived as a response to market developments.

Before entering the market, each manufacturer prepared a distinct project, with the contribution of technical staff from the marketing and commercial areas, or by hiring third-party companies to evaluate the market. The programs were initially launched through pilot projects, two of which adopted the practice of benchmarking, using positive results from programs belonging to the same business group or competitors.

Another reason that encouraged automakers to create subscription car programs was the need for a business model that encouraged the commercialisation of the significant volume of cars produced. To illustrate, in 2012, more than 3.6 million cars were sold, when the country ranked 4th in the world in the ranking of light commercial cars. However, in 2022, this position fell to 6th, with the sale of 1.95 million cars, indicating a significant drop of more than 46% compared to 2012 (Fenabreve, 2017, 2022).

Faced with this scenario, many automakers found themselves faced with the imminence of selling their stocks, resorting to significant discounts and/or seeking financial solutions, especially in partnership with banks from the same business group. These measures were essential to cover production costs and maintain competitiveness in the market. However, this moment created a relationship of dependence, in which

automakers took advantage of the opportunity to sell cars in large volumes, although without reaching the desired profit margins.

The scenario faced by vehicle manufacturers in the country provided notable growth for car rental companies. This advance in the rental segment and in independent rental companies (IRCs) motivated automakers to explore this market more deeply. Additionally, the presence of a considerable portion of consumers inclined to exchange vehicle ownership for the convenience of use was identified.

At the same time, the offer represents an attempt to get closer to the consumer market. Through digital platforms, the brand establishes direct contact with the end user, replacing the traditional service previously provided through dealership partners.

It is important to emphasise that the car subscription business model such activities are part of a broader strategy adopted by many car manufacturers, with the redefinition of the business model and the growth of downstream services.

5.4 Market

The car subscription market is concentrated in major cities, especially in the capitals. The Southeast region, notably the states of São Paulo, Rio de Janeiro, and Minas Gerais, shows the most significant adoption rates. However, some cities in the Central-West and Northeast regions have demonstrated good receptivity.

This concentration in major cities is driven by factors such as income levels, media exposure, competition, and the characteristic profile of urban vehicle users. In these areas, large dealership groups operate with multiple brands and have specialised teams solely dedicated to prospecting and selling this service. The presence of these dedicated teams is considered a significant advantage. The market is expanding, and in addition to the subscription programs offered by manufacturers and IRCs, smaller companies are entering this segment. Currently, the IRCs lead the car subscription market, with the merger of the two largest companies in this sector holding approximately 90% of the market share.

5.5 User profile

Car subscription services are typically sought to meet the needs of a second vehicle in the family. Both genders show interest in the service, with a significant interest observed among men. Users of this service tend to be between 25 and 40 years old, mostly married, and have completed higher education. Additionally, they have an income ranging from 10 to 15 times the minimum wage, characterised by a younger age group compared to financing customers.

Regarding professions, subscription customers encompass a variety of occupations, including business managers, civil servants, doctors, university professors, psychologists, lawyers, engineers, freelancers, and self-employed individuals. The subscription customer profile is marked by a stronger affinity with technology, being open to experimenting with new technological solutions and possessing solid knowledge in financial management and investments. These characteristics may vary slightly across different regions of the country, depending on local peculiarities.

5.6 *Quality management: market relationship*

The automotive industry plays a crucial role in evolving quality management concepts, especially in improving processes and products. However, fundamental concepts such as durability and reliability, traditionally essential for durable goods like vehicles, take on a different perspective for subscription service consumers. These customers benefit from consistently enjoying new cars that require minimal maintenance interventions.

5.7 *Value proposition*

Regarding the main benefits offered by car subscription services to users, it was identified that the proposal aims to simplify people's routines, as highlighted by one of the managers: 'People want to simplify their lives and reduce the energy spent on administrative tasks that do not bring satisfaction. The subscription provides independence, flexibility, convenience, and the practicality of a car without the complexity and costs associated with ownership' (Interviewee K).

Within the package of advantages, this model allows the use of a car without the need to invest large amounts initially or commit to financing with high-interest rates. Additionally, it offers cost predictability for maintenance and relieves users from the bureaucratic concerns and responsibilities associated with ownership, such as vehicle taxes, licensing, insurance, and buying/selling processes.

In terms of financial management, the subscription service provides users with cost predictability, generating liquidity in the financial market. This means there is the possibility to invest resources that would have been allocated to acquiring a tangible asset that tends to depreciate over time. In cases of subscription plans for companies, there are also fiscal benefits for those opting to outsource their fleets.

Subscription programs also propose safety and technical support, as all revisions and maintenance are scheduled at dealership networks.

5.8 *Configuration and value delivery*

The car subscription service business model presents unique differentiators, especially due to the power of major brands and corporate groups. Therefore, managers were consulted to identify factors that provide competitive advantage, highlighting activities, resources, capabilities, and partnerships that make car subscription programs attractive and position offering companies in a privileged position.

Dealerships and automakers were cited as key allies for consolidating this business. Some activities were identified as differentiators for car subscription programs, including:

- 1 digital journey
- 2 the possibility of paying instalments in advance
- 3 purchasing large vehicle lots
- 4 service flexibility
- 5 engagement with dealership partners.

Regarding the main resources and capabilities of car subscription programs offered by automakers in Brazil, the importance of the brand, ecosystem, people, and technology (digitalisation) were highlighted. These elements are essential to build and sustain the competitive advantage of these programs in the market.

5.9 Sustainability

The model is perceived as economically sustainable by the interviewees. The cost structure comprises various elements, including marketing, car acquisition, documentation, insurance, commissions for dealerships, fleet management (maintenance and logistics), and personnel. Revenues come from contract fees and subscription monthly payments. One manager highlighted that the model has a long financial conversion cycle, as financial results are realised only after the lease and sale of the used vehicle.

Regarding environmental sustainability, the programs follow the brands' guidelines without establishing specific plans or actions. Electric cars are already part of the models offered in the subscription service, although they face challenges related to the need for expanding charging infrastructure. However, there is a positive perception of improvement in the development curve of electric cars. Commitment to environmental sustainability could be an area of opportunity for subscription programs in the future as infrastructure and acceptance of electric cars grow.

5.10 Digitalisation

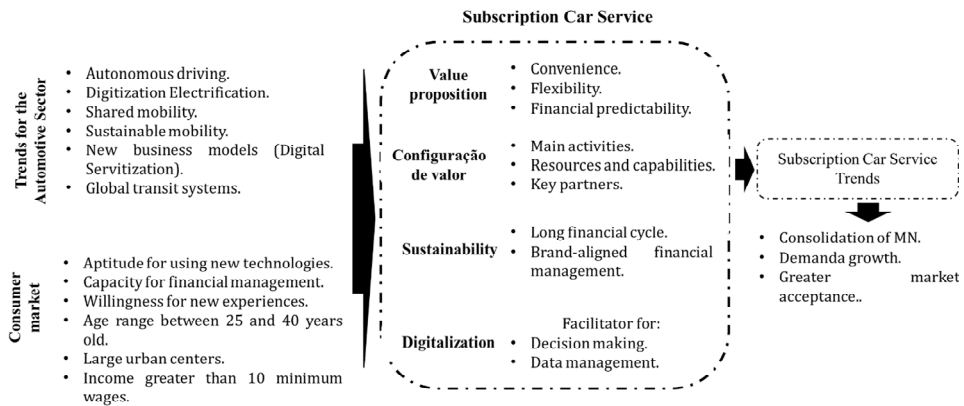
Regarding the incorporation of digital technologies, specific details about the adopted technologies were not provided, but indications were made about using technologies to operate the service on the digital platform and to track relevant industry and user data.

User navigation on digital platforms was highlighted as a significant source of data. This information allows for the identification of key choices and paths used by customers, providing valuable insights into user behaviour. However, managing the large amount of generated data was mentioned as a challenge that could impact the efficient operation of the service.

One manager, who serves as a data analyst, emphasised the importance of digitisation in the business model. He highlighted that the lean teams in the programs are a result of investment in technologies capable of assisting people in decision-making. Specifically, he mentioned the use of tools like Power BI for data modelling and processing, big data, artificial intelligence for contract creation and statistical analysis, and low-code automation for task simulation. This approach demonstrates how technology plays a crucial role in operational efficiency and decision-making in car subscription programs.

5.11 Trends

Managers have a positive outlook on the exponential growth of the car subscription service, reflecting confidence in its consolidation in the mobility market. The alignment with automotive industry trends demonstrates the service's ability to adapt to changes and meet the expectations of modern consumers. These optimistic viewpoints towards the ongoing evolution and acceptance of the car subscription business model (see Figure 5).

Figure 5 Trends for subscription car service

5.12 Value drivers

To analyse the drivers of value for the car subscription service, it was important to identify facilitating factors and barriers. These factors were classified into eight categories: external organisational factors, internal organisational factors, economic factors, sociocultural factors, customer relationship, technological factors, legal factors, and environmental factors.

The main facilitators for the development of the car subscription service are:

- 1 cultural shift among customers
- 2 technology
- 3 ecosystem
- 4 business model
- 5 customer opportunity cost
- 6 major urban centres.

Regarding barriers, the main obstacles to the car subscription service are:

- 1 conflict with dealerships
- 2 preference for car ownership
- 3 customer education level
- 4 competition from IRCs
- 5 delivery time
- 6 customer service.

The need for improvements in the service package offered as already evaluated in another study conducted in São Francisco Bay area (Lidicker et al., 2011).

5.13 Summary of interviews

The results have been synthesised into an illustrative table. Table 3 aims to summarise and revisit the key findings to facilitate analysis of the business model structuring process.

Table 3 Summary of main discoveries and confirmations

<i>Analysis focus</i>	<i>Key findings</i>
Subscription car service concept	Car rental service, by an individual or legal entity, for a long-term period, after signing a contract.
Motivations for starting operations	The concern and monitoring of automakers with trends in the automotive sector. Opportunity for vehicle manufacturers to get closer to the market (consumer and partners). Take advantage of the evolution of the long-term vehicle rental market offered by (IRC's). Need to sell idle vehicles and reduce stock.
Work teams	Lean teams of up to 40 people, including management, finance, marketing, sales, and logistics departments.
Operationalisation	Company from the business group that takes advantage of the supply chain and the strength of the brand to operate the service and expand sales opportunities for cars produced by the manufacturer.
Customer journey	The customer journey is digital. However, in the case of large fleets for business customers, service is more personalised.
Market	The subscription car market is concentrated in large cities, mainly capitals, in the southeast and central-west regions.
Competition	The main competitors of subscription programs offered by vehicle manufacturers are IRCs.
User profile	The user profile has the following characteristics: men and women, age range between 25 and 40 years old, married, higher education, income between 10 and 15 minimum wages, open to trying new technological innovations, with digital and financial management skills.
Customer relationship	The interaction between the customer/user and the subscription program is digital. Service quality management is related to the effectiveness of interactions and relationships with the customer/user.
Value proposition	The value proposition mainly includes convenience, flexibility, convenience, and financial predictability.
Competitive advantage	The elements that make up competitive advantage are the brand, exclusive sales teams, partners, technology, flexibility and agility in service.
Sustainability	It is an economically sustainable service, has a long financial conversion cycle, requiring working capital to subsidise its activities. Environmental sustainability proposal aligned with the brand's strategic planning. The service does not present specific environmental sustainability projects, as it is part of the brands' strategic framework.

Table 3 Summary of main discoveries and confirmations (continued)

<i>Analysis focus</i>	<i>Key findings</i>
Digitisation	Managers were unable to detail the role of digitalisation in the car subscription business model in Brazil. When mentioned, digital technologies were described as facilitators for decision-making and data management.
Trends	The trend is for the service to follow a line of growth supported by the consumer's cultural change in favour of the shared economy, new mobility as a service (MaaS) business models, technological advances, and investment opportunities for the customer.
Value drivers	Facilitators: The main facilitators are the cultural change of customers, the ecosystem, large urban centres, the business model, technology, and the customer's opportunity cost. Barriers: the main barriers are conflict with dealers, preference for car ownership, the customer's level of education and competition from (LI's), delivery time and service.

6 Structuring the business model

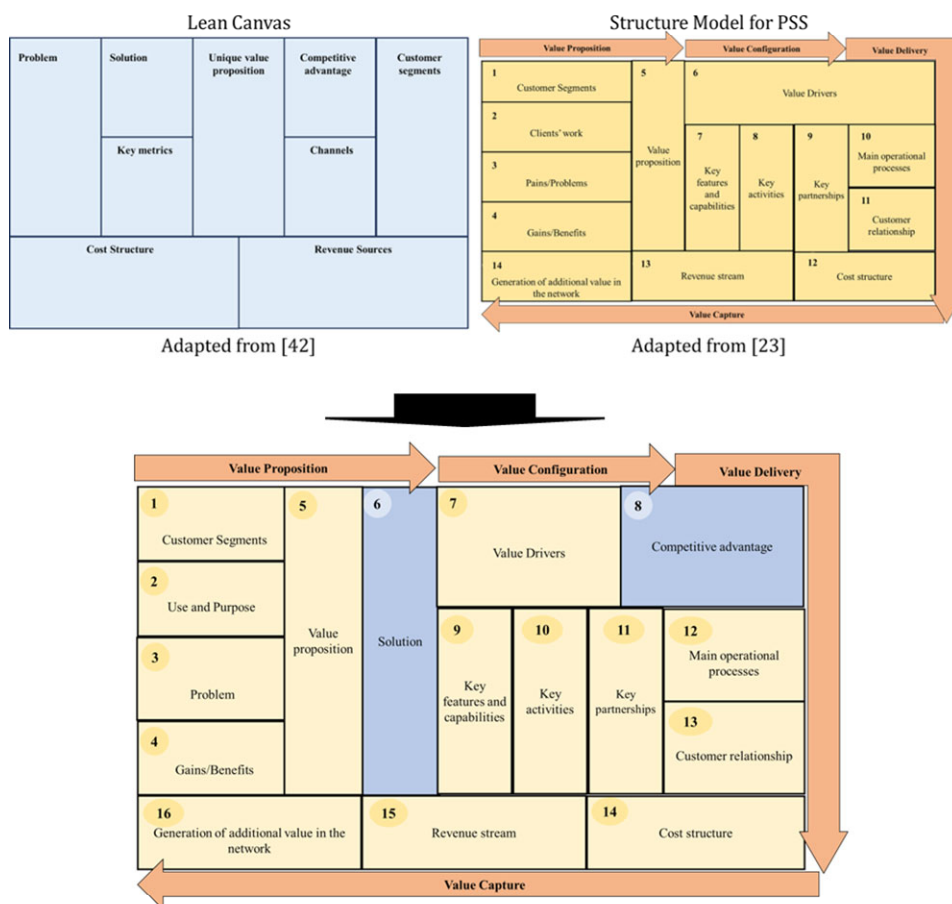
The current business model was structured by adapting two frameworks: the Lean Canvas (Maurya, 2012) and the product-service sustainable (PSS) framework (Moro et al., 2022), as depicted in Figure 6. The choice of these frameworks followed specific criteria:

- a the lean canvas is a well-established model encompassing elements of a generic business model, especially suited for technology companies and startups
- b the structure developed for a PSS system offers significant potential for building sustainable business models.

As seen in Table 4, the fifteen propositions formulated during the phases of interviews with managers and industry experts in the long-term car rental sector were analysed. Propositions P2, P3, P5, P6, P8, P12, P13, and P15 were confirmed. Other propositions, P1, P4, P7, P9, P10, P11, and P14, were partially confirmed, as the propositions were evaluated to some extent. However, propositions P16 could not be assessed because the information collected in the interviews was insufficient to confirm or refute the propositions.

Based on the evaluation of these propositions, the business model (MN) for car subscriptions offered by vehicle manufacturers in Brazil can be structured. Accordingly, the components of the business model were filled based on the digital servitisation process, as outlined in Figure 7.

The structuring of the business model (MN) served to gain a comprehensive understanding of the car subscription service and provides insights into its operationalisation, challenges, and opportunities for improvement. Below are the conclusions and final considerations.

Figure 6 Base structures for the business model (see online version for colours)

Source: Adapted from Maurya (2012), and Moro et al. (2022)

Table 4 Confirmation of propositions for structuring the business model (see online version for colours)

Components	Propositions	Findings	Confirmation
P1: Customer Segment	The target audience comprises individuals aged between 18 and 25, holders of a driver's license and residents of large urban centres.	Men and women between 25 and 40 years old, married, higher education, income of +10 thousand reais and residing in large urban centres	Partially confirmed
P2: Use or purpose	Work, leisure and travel.	Work, leisure and travel. Second residential car.	Confirmed
P3: Problem	People want to enjoy a car without having to buy one.	Users want to enjoy the car, simplify their lives, freeing themselves from the obligations of ownership.	Confirmed

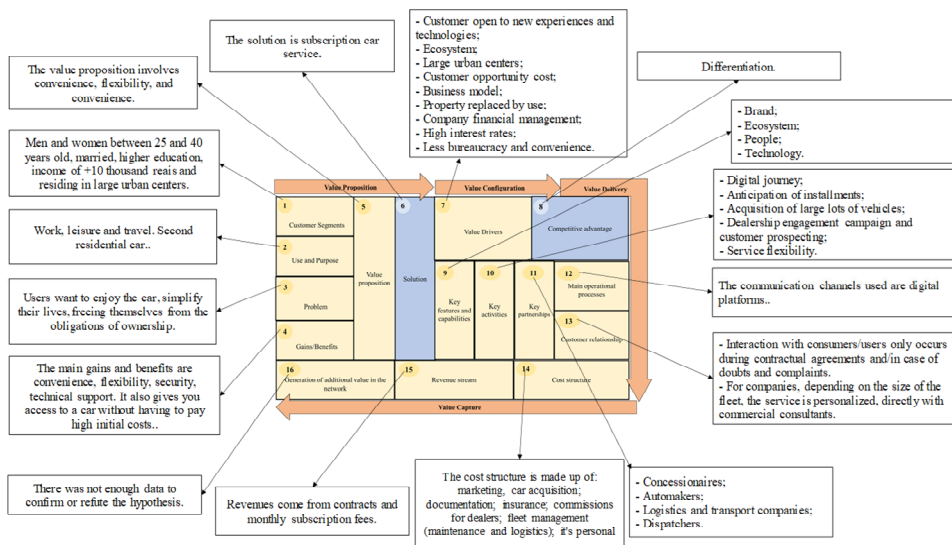
Table 4 Confirmation of propositions for structuring the business model (continued)
(see online version for colours)

<i>Components</i>	<i>Propositions</i>	<i>Findings</i>	<i>Confirmation</i>
P4: Gains and benefits	The convenience of a private vehicle without the obligations; more flexible business model compared to rental services.	The main gains and benefits are convenience, flexibility, security, technical support. It also gives you access to a car without having to pay high initial costs.	Partially confirmed
P5: Value proposition	The main value delivered to the consumer is convenience.	The value proposition involves convenience, flexibility, and convenience.	Confirmed
P6: Solution	The solution is subscription car service.	The solution is subscription car service.	Confirmed
P7: Value drivers	Digitalisation; people; ecosystem; pro-servitisation culture; organisational structure; tangible goods and services; innovation.	Customer open to new experiences and technologies; ecosystem; large urban centres; customer opportunity cost; business model; property replaced by use; company financial management; high interest rates; less bureaucracy and convenience.	Partially confirmed
P8: Competitive advantage	Differentiation.	Differentiation.	Confirmed
P9: Key features and capabilities	People; digitisation; capital; collaboration; relationship with the market; innovation; development of supply, capture, and value architecture processes.	Brand; ecosystem; people; technology.	Partially confirmed
P10: Key activities	Develop pro-servitisation culture; interaction with the customer (co-creation); data management; innovation; inter-organisational and intra-organisational relationships; cost structure; value proposition.	Digital journey; anticipation of installments; acquisition of large lots of vehicles; dealership engagement campaign and customer prospecting; service flexibility.	Partially confirmed
P11: Key partnerships	Suppliers; partners; consumers; government; educational institutions; competitors; companies in the same group.	Concessionaires; automakers; logistics and transport companies; dispatchers.	Partially confirmed
P12: Main Operational Processes	The communication channels used are digital platforms.	The communication channels used are digital platforms.	Confirmed

Table 4 Confirmation of propositions for structuring the business model (continued)
(see online version for colours)

<i>Components</i>	<i>Propositions</i>	<i>Findings</i>	<i>Confirmation</i>
P13: Customer relationship	Interaction with consumers/users only occurs during contractual agreements and/in case of questions and complaints.	- Interaction with consumers/users only occurs during contractual agreements and/in case of doubts and complaints. - For companies, depending on the size of the fleet, the service is personalised, directly with commercial consultants.	Confirmed
P14: Cost structure	The cost structure is formed by the CAC – customer acquisition cost, which will be made up of marketing, platform, administrative (contracts) and personnel.	The cost structure is made up of marketing, car acquisition; documentation; insurance; commissions for dealers; fleet management (maintenance and logistics); it's personal.	Partially confirmed
P15: Revenue stream	Revenues are generated from the signing of contracts for the use of a car for a specific period.	Revenues come from contracts and monthly subscription fees.	Confirmed
P16: Generation of additional value in the network	Circular economy; reverse logistic; compliance; support for social projects or programs.	There was not enough data to confirm or refute the proposition.	*Inconclusive

Figure 7 Structured subscription car business model (see online version for colours)



7 Conclusions

This article addressed the process of digital servitisation in the automotive sector, aiming to structure the business model of car subscription services offered by vehicle manufacturers in Brazil. Key findings include the characterisation of service operationalisation and a comprehensive analysis of the car subscription market in Brazil. Additionally, the study identified the components of the business model (MN), as well as the driving factors and barriers for the development of this innovative service. Following this analysis, the study provides a set of clearly defined implication.

7.1 Implications

- a Theoretical implications: this study was guided by the central question: What is the structure (design) of the car subscription business model offered by vehicle manufacturers in Brazil? Initially, we developed a new framework for the business model, resulting from the integration of two established frameworks in the literature. Subsequently, the findings were carefully analysed and incorporated into this new framework, thereby outlining the components of the business model. The results contribute to the understanding of business models based on digital servitisation, paving the way for new research and investigations in the area.
- b Practical implications: managerial implications: structuring the car subscription business model (MN) provides program managers and other decision-makers in the automotive sector with a clearer visualisation of service components. Figure 6 offers an updated representation of the service, making it easier to identify potential bottlenecks and improvement opportunities.
- c Economic implications: the results of this study offer valuable insights into the car subscription market in Brazil. They highlight that the car subscription business model (MN) is in a learning stage but is destined to consolidate. Vehicle manufacturers must adopt comprehensive strategic measures to fully integrate this service into their framework, to keep pace with industry trends and meet the evolving demands of consumers.

7.2 Final remarks

This article provides two significant contributions: from a micro perspective, it deepens research on the car subscription model in the Brazilian automotive sector. From a macro viewpoint, it contributes to a broader understanding of the culture of shared mobility and the subscription market in Brazil. The car subscription service offered by manufacturers in Brazil, despite being around for about 4 years, faces challenges and is not yet fully recognised by the entire consumer base. The main findings have been summarised in Table 5, and based on these results, we propose an agenda for future research.

The findings from this study open new avenues for research on car subscription services. While the service is experiencing growth, further development is needed to take advantage of enabling factors and minimise barriers. Additionally, it is crucial to analyse user perceptions regarding the quality of service offered by manufacturer subscription programs. The absence of studies on service quality limits assessments and comparisons with services offered by IRCs.

Table 5 Main findings and future research agenda

<i>Key findings</i>	<i>Future research agenda</i>
• Identification of the components of the car subscription business model (MN). • Understanding the driving factors and barriers for service development. • Characterisation of the operationalisation of the MN. • Analysis of the car subscription market in Brazil.	• Analysis of improvement opportunities for the car subscription service offered by vehicle manufacturers in Brazil. • Analysis of the perspectives of consumers who use or have used car subscription services. • Evolution of the car subscription market in Brazil. • Evaluation of additional value generation within the network.

Another research gap that could not be evaluated in this study is the potential for generating additional value within the operating network. Future studies should focus on the relationship between car subscription services and the circular economy. This service significantly alters the lifecycle of automobiles (Marino and Jayakrishnan, 2024). Therefore, more studies are important to analyse the impact of service development on the vehicle life cycle.

This study had limitations as it only focused on the perspectives of managers and experts in the car subscription service, without direct input from users. The results seek to contribute to understanding the thematic elements surrounding subscription economics and digital servitisation in the automotive sector. It is important to note that there was no intention to exhaust the analysis on the topic.

From a broader perspective, organisations need to establish a long-term strategy considering quality management from a market relationship perspective, optimising internal resources and capabilities in partnership with other actors in their ecosystem. Sustainability and innovation should not be considered isolated concepts but rather institutionalised as guiding values in all decisions involving the organisation and its context.

The service is already a reality, with exponential growth in subscriptions and consolidating itself as a great mobility alternative. The programs are new and the market is still getting used to them, but we believe in the growth and development of the service in Brazil. The trend is for the car subscription service in Brazil to follow a growth path, driven by the cultural shift of consumers in favour of the shared economy, new business models of mobility as a service, technological advances and investment opportunities on the part of customers.

In conclusion, the digital servitisation process adopted by vehicle manufacturers through car subscription services still requires updates and adjustments to better serve the consumer market. Organisations need to adopt measures to keep up with industry trends, maximise facilitating factors, and minimise barriers challenging service providers.

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