



THE IMPORTANCE OF ORGANIZATIONAL CAPABILITIES IN THE EXPANSION OF THE ELECTRIC BUS INDUSTRY IN BRAZIL

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ABSTRACT

This article assesses the relevant organizational capabilities needed for the electric bus industry in Brazil to achieve significant market performance. The qualitative research relies on a literature review to analyze the state of the art and identify sector gaps. The results indicate that, to address challenges such as lack of funding, it is essential to develop organizational capabilities such as governance, leadership, innovation, and organizational culture. These capabilities are crucial for mobilizing resources, consolidating strategic partnerships, and implementing policies and practices that promote the transition to sustainable mobility, both for decarbonizing public transport and strengthening the national industry.

Keywords: Learning Capabilities; Battery Electric Buses; Sustainable Mobility; Technological Innovation.

INTRODUCTION

The electric bus industry in Brazil is emerging as a promising alternative for sustainable mobility, aligning with global trends in decarbonization and technological innovation. Although the country's production capacity is still limited due to the market being in a consolidation phase, many industries are showing increasing interest in the sector.

However, the adoption of these vehicles faces challenges, as described by Segantin (2019), which include: i) the need for adequate financing; ii) difficulties in battery application and charging; iii) lack of public policies for their introduction; iv) limited production capacity and market uncertainties; v) absence of management



strategies and green policies; vi) the need for qualified personnel to operate and maintain the vehicles.

In this context, the objective of this research is to identify the essential organizational capabilities for the electric bus industry in Brazil to overcome current challenges and stand out in the competitive market, considering that, according to May (2018); Jafarzadehfadaki, Abbasi, and Esmaeilzadeh (2018); and Flaris et al. (2023), these vehicles have the potential to save energy and reduce emissions, but their adoption is still slow and decisions about where to deploy electric buses are dominated by economic and technological considerations.

Dávila (2012) defines organizational capabilities as the interaction between physical structure and human skills, categorizing them into technical, functional, and managerial. He highlights that, within managerial capabilities, governance refers to the senior management's ability to establish standards, integrate operations, and allocate resources to ensure the organization's survival.

Aligned with organizational capabilities, dynamic capabilities (DC), according to Teece, Pisano and Shuen. (1997), refer to a company's ability to integrate, build, and reconfigure competencies to adapt to changes. To be effective, these capabilities require entrepreneurial management that tests new trends, refines business models, and manages assets both internally and externally (Teece, 2016; Teece, 2023). The DC approach suggests that core competencies help modify short-term positions to build long-term competitive advantages (Teece, 2024).

The global transportation sector is responsible for 25% of energy-related CO₂ emissions, with 45% of these coming from road passenger transport (Bogacki and Bzdziuch, 2019; Maier, Posch, and Plakolb, 2022). In Brazil, decarbonization is both a response to climate change and a strategy to improve public transportation, considering the country's favorable energy matrix and its potential to lead in electric mobility (Siqueira, Tavares, and Silva, 2023).

Thus, it is essential to engage the electric bus sector in developing effective organizational capabilities to ensure a successful transition, not only because of its relevance for decarbonizing public transportation but also for strengthening the national industry.



MATERIALS AND METHODS

This qualitative research aims to identify the essential organizational capabilities for the bus industry in Brazil to overcome its challenges and stand out in the market. To address this issue, a literature review was conducted, which guided the investigation in analyzing the state of the art, identifying gaps, and defining the theories underpinning the study. Thus, relevant topics were examined to find solutions that contribute to the sector's development, as detailed below.

RESULTS AND DISCUSSION

After reviewing the literature, this section presents the research findings on the challenges faced by the electric bus industry in Brazil and analyzes the organizational capabilities needed to overcome these challenges. The main challenges and proposed solutions are:

There is a need for adequate funding, as the lack of resources can hinder the implementation of the necessary infrastructure. The solution involves partnerships with financial and educational institutions, as well as seeking tax incentives and government support programs.

The challenges in battery application and recharging due to technical and logistical issues related to recharging and battery efficiency can be addressed with investments in technical development, creation of specialized centers, and collaboration among transportation sector actors.

Lack of public policies that promote electric buses can be resolved through collaboration between government institutions and international organizations, active participation in discussions on regulation and infrastructure, and the implementation of fleet management strategies and green policies.

Limited installed capacity and restrictions on local production can be addressed by expanding local production capacity through strategic partnerships and investments in the reindustrialization of the Brazilian automotive sector, as well as exploring opportunities in Latin America and Africa.



Finally, the development of skilled personnel can be addressed through collaborations with educational institutions, such as Senai, and through ongoing training programs. Additionally, utilizing simulators and forming multifunctional teams dedicated to the production and maintenance of electric vehicles are crucial for ensuring that professionals are equipped to manage the specific challenges associated with electric buses.

CONCLUSION

The research highlights the importance of organizational capabilities for the electric bus industry in Brazil, identifying them as essential for overcoming challenges such as lack of funding, technical problems with batteries, absence of public policies, and the need for professional qualifications. Capabilities such as governance, leadership, organizational culture, and innovation are fundamental for the sector's advancement and for improving market performance.

These findings address the article's objective, which is to understand which organizational capabilities are necessary for the industry to face its challenges and stand out. Despite the limitations of the qualitative approach, due to reliance on existing literature, the study provides a foundation for future discussions and suggests conducting comparative research between countries to refine strategies and promote sustainable mobility in Brazil.

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