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# Market Acceptance Strategy through Customer Centricity Approach in Electric Truck Product Development with Systematic Method Literature Review

**Sekar Widyasari Putri[1*], Dominggo Bayu Baskara[2] , Krisnayanti Aditasari[3]**
Universitas Telkom, Surabaya, Indonesia
Email: sekarwidyasariputri@telkomuniversity.ac.id[1*]

*Correspondence

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***ABSTRACT***

Transportation is one of the contributors to $CO^2$ pollutants that cause Greenhouse Gas (GHG) emissions, ultimately impacting global climate change. The creation of electric vehicles is concerned with clean energy and handling global climate change. This aligns with the 17 global goals of the United Nations, which are the world agenda to protect planet Earth and for everyone to live a decent life by 2030. However, creating innovations in production and transforming consumers to switch from fuel vehicles to electric vehicles, especially electric trucks, is equally difficult. In 2022, based on data from Vehicle Type Approval, electric truck sales in Indonesia have the lowest number compared to other types of electric vehicles. This study aims to discover how innovation should be carried out and how consumer desires can be fulfilled from these innovations so that the market easily accepts electric truck products with the hope that interest and sales can increase. This study uses a literature study method that provides an overview of how the customer-centricity approach is applied to support innovation during production. The results of this study provide suggestions in the development of electric trucks that companies should not only focus on technology but also focus on consumer needs to adopt electric truck technology such as cost and economic benefits, charging infrastructure available in various locations, government support and policies, social influence, economic and social factors, promotion policies and regional support.

## Introduction

The adverse impact of $CO^2$ pollutants from the transportation sector, such as global warming and Greenhouse Gas (GHG) emissions, also affects the changing needs of consumers for more environmentally friendly transportation. The presence of electric vehicles is a solution to reducing costs and environmental impacts from the mobilization of society and logistics operations. Therefore, manufacturing in the carousel sector has begun to develop electric vehicles. Innovation is important in the business cycle to provide novelty (van Riel et al., 2021). In modern marketing concepts, manufacturers are not only required to be able to create innovative products but also have a competitive

advantage (Reshetko et al., 2021). This concept must also be applied to the electric vehicle industry. Because the electric vehicle industry promises to reduce carbon dioxide emissions and dependence on oil (Huang et al., 2021). As a solution to reducing costs and environmental impacts from mobilizing public goods and logistics operations, manufacturers now widely develop electric vehicles in carousels, including electric trucks as vehicles for transporting goods (Bansal et al., 2021).

Research and development of electric trucks are not only carried out and are in demand by carousel manufacturers but have also begun to be developed by educational institutions/universities. Telkom Institute of Technology Surabaya is one of the universities that has developed electric trucks starting in 2021-2022. The features offered on electric truck products include using a 50kw motor dynamo with a 96v 400ah controller that can produce a speed of 70km/h, the battery used is 96v 200ah capable of traveling a distance of 60km, this electric truck is also equipped with a feature that can detect the load carried. However, the current obstacle is that ready-made electric truck products have not been in demand by the industry, and the marketing carried out has not been maximized, so electric truck products researched by the Telkom Institute of Technology, Surabaya have not been commercialized. The following is a prototype electric truck from the Telkom Institute of Technology Surabaya.

**Figure 1. Electric Truck Prototype of Telkom Institute of Technology Surabaya**

In the development of electric vehicles, manufacturers often focus on innovation and technology, such as features on electric trucks, as an effort to differentiate products to achieve competitive advantages. But the real challenge is how the product can be marketed and accepted by the market. Often, manufacturers only focus on the process and ignore customer centricity. The lack of consumer acceptance of electric vehicles is the main problem in increasing the growth of electric vehicle production (Huang et al., 2021). The total sales of lyric vehicles in Indonesia in 2022 were 21,987 units, based on the following vehicle type comparison.

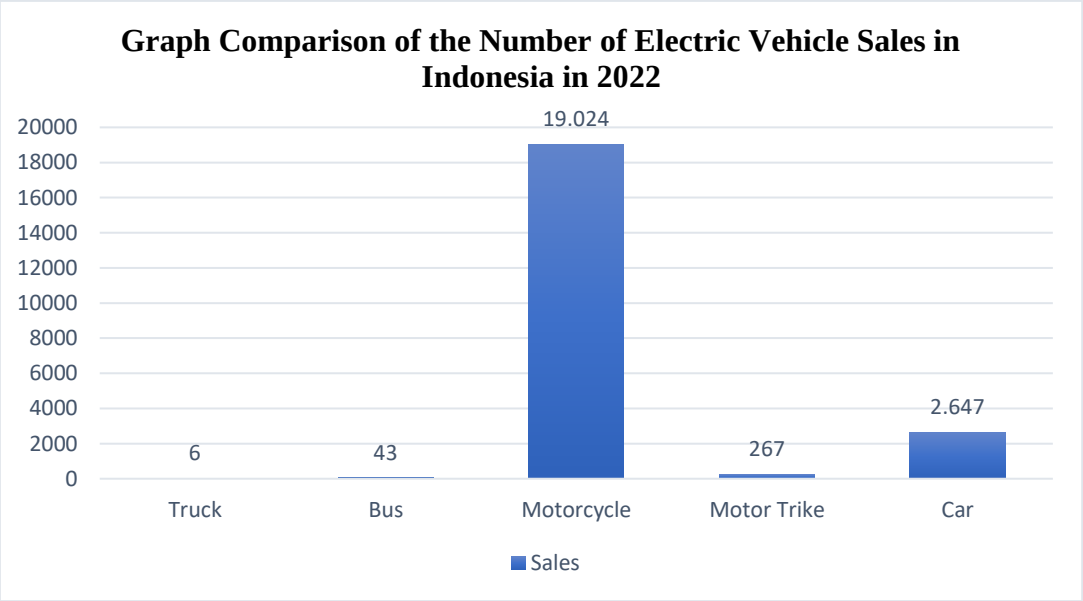



**Figure 2. Comparison Chart of the Number of Electric Vehicle Sales in Indonesia in 2022**

Source: Vehicle Type Approval (2022)

The graph shows that truck/freight electric vehicles have the lowest sales. The results of the study confirm that consumer preference for electric vehicles for transporting goods with batteries is low (Rommel & Sagebiel, 2021). The low interest in electric vehicles transporting goods in Indonesia is influenced by infrastructure limitations such as the number and distance of charging stations; while abroad, this is not an obstacle, so transportation in the form of trucks has been electrified. Therefore, in the manufacture of electric trucks, it is necessary to adjust to the existing conditions in the market to attract consumer interest, this means that a customer-centric approach is very important when carrying out the development and production process (Benzidia et al., 2021)

Customer-centric is a strategy that puts customers at the center of all the Company's activities (Kreuzer et al., 2020). The customer-centricity strategy has been widely used and has given success to the Company. Companies that implement this strategy will focus their business processes on customer desires ranging from manufacturing, pre-sales and services so that the products produced are according to customer needs, which will ultimately increase customer retention (Magatef et al., 2023). What is needed in customer centricity is to understand the expectations of product features and the interaction between customers and the company in the business process (Hampton et al., 2022).

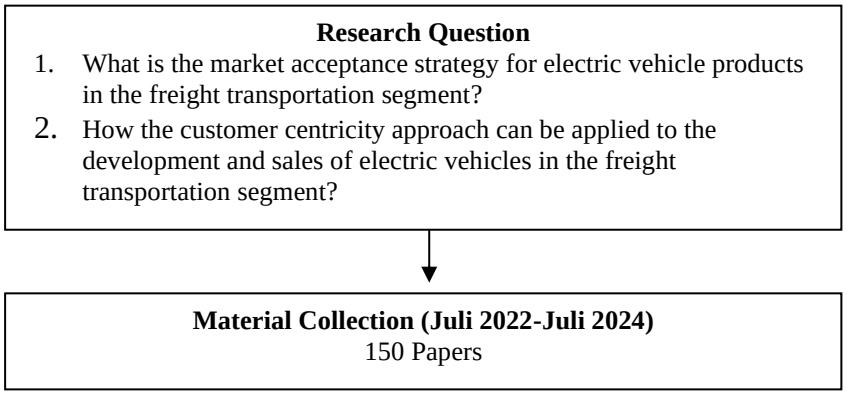
This research is part of the development of electric vehicles that is being carried out by a research team at the Telkom Institute of Technology Surabaya campus. The focus of this study is to apply a customer-centric approach in the production process of electric trucks because in 2023, the electric vehicle development team at the Telkom Institute of Technology Surabaya plans to be able to commercialize the results of the electric vehicle.

This research departs from two main questions, which focus on understanding the market dynamics and adoption strategies for electric vehicle products in the freight transportation segment. The first question seeks to determine the most effective market acceptance strategy for electric vehicle products, specifically in the context of freight transportation. It aims to explore various factors that influence market readiness and consumer interest in transitioning from traditional fuel-based vehicles to electric trucks. The second question examines how the customer centricity approach can be effectively applied in the development and sales processes of electric vehicles within the freight transportation segment. This involves investigating how focusing on consumer needs and expectations during product development can enhance the overall marketability and adoption rate of electric trucks. Together, these questions guide the research towards developing actionable insights for improving electric truck adoption by aligning innovation with consumer preferences.

# Methods

## Research Design

This research aims to solve the problem by answering the main question of how to develop electric vehicles, especially freight transportation that is ideal for consumers, how the production of electric trucks can meet the desires and needs of consumers so that they can be accepted and even compete in the electric vehicle market for freight transportation. This research is qualitative, and the problems in this study will be solved using a systematic literature study method, namely a methodology that provides suggestions to researchers in a structured and explicit manner to support the solution to the problem being researched. Research methods through literature study start from identifying, evaluating and synthesizing a collection of research produced by researchers, academics and practitioners (Klein Marodin et al., 2023). Literature studies are also analyses in the form of criticism and suggestions from research that is being carried out on a specific topic. This method was chosen because it is most suitable for the problem being researched, namely how to apply customer-centric in the development of electric trucks so that the commercialization of electric vehicles becomes successful; in this case, the development team needs to solve the problem through suggestions from the scientific literature. The following is a systematic literature review framework that will be used to answer the problems in this study.



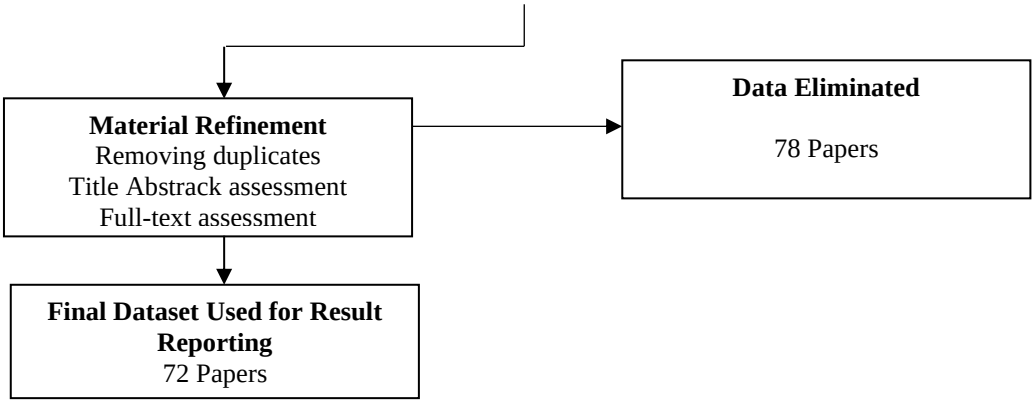



**Figure 1. Literature Review Framework**

### Case Selection

The research object is an electric truck product developed by the Telkom Institute of Technology Surabaya. The problem was discovered through direct observation during 2021-2023. The resource persons in this study are an electric truck development team consisting of students and lecturers.

## Results and Discussion

At the same time, electric vehicle developers are faced with two circumstances; on the one hand, they must maintain efficiency in the electric vehicle development process due to limited resources and on the other hand, they cannot ignore the satisfaction of customer needs (Scherrer et al., 2020)This section will discuss the application of a customer-centricity strategy in the development of electric vehicles based on the results of literature studies.

From the results of the dataset synthesis that has been carried out, key points are obtained that can be used as a customer-centricity approach. By implementing these key points, it is hoped that the development of electric truck technology can affect the adoption of electric vehicle technology. These key points have been summarized in the following table

**Tabel 1. Poin Kunci Pendekatan Customer Centricity untuk Adopsi Teknologi Pengembangan Truk Listrik**

| No | Key Point | Sitesis Result | Implementation | Literature |
|---|---|---|---|---|
| 1. | Environmental Awareness and Concern | The study results show that interest in technology adoption in electric vehicles is influenced by consumer technology awareness. | The strategy that can be implemented is for automakers to focus on increasing environmental awareness and organizing more customer-centric, experience-based activities. | (Pai et al., 2023), (Zhao et al., 2016), (Rotaris et al., 2021), (Ling et al., 2021), (Okada et al., 2019), (Shetty et al., 2020), (Pramajaya & Haryanto, 2021), (Huang & Ge, 2019), (Fan et al., 2020), |

| | | | | |
|---|---|---|---|---|
| | | | | (Zhao, Noori, & Tatari, 2016). |
| 2 | Economic Costs and Benefits | a. Long-distance truck electrification could generate economic benefits of more than $5 billion per year in climate and health damage avoidance,<br>b. Medium electric trucks offer cost advantages and lower GHG emissions in the life cycle compared to non-electric technologies.<br>c. Break-even analysis shows that electric trucks can achieve cost parity with diesel trucks within a few years, depending on their weight class.<br>d. Semi-electric trucks have a payback period of about 3 years, depending on the battery replacement factor and the price of electricity.<br>e. The purchase cost and maximum range are important vehicle attributes for potential buyers of electric vehicles. | Developing electric trucks with the lowest weight class first to produce trucks at more affordable prices to increase consumer interest in adopting these electric trucks. Affordable electric truck prices make the payback period shorter.<br><br>Developing electric trucks with long mileage capabilities<br><br>Developing electric trucks with long battery life | (Babu et al., 2022), (van Riel et al., 2021), |
| 3 | Charging Infrastructure | a. The availability of charging at work and public locations is the | Developing charging stations in offices and various public locations such as rest areas and ports. | Michael et al. (2022), (Zhao et al., 2016), (Shetty et al., 2020), (Fan et al., |

| | | | | | |
|---|---|---|---|---|---|
| | | | most considered factor by consumers when buying an electric truck after their residence.<br>b. Most households will pay annually to develop and install fast charging stations.<br>c. Sufficient charging infrastructure must be adopted to improve EV owners' convenience and reduce queues' duration. | Developing fast charging stations in electric truck pools.<br><br>Increase the number of charging stations to reduce queues. | 2020), (Huang & Ge, 2019), (Pramajaya & Haryanto, 2021), (Ling et al., 2021), (Pai et al., 2023), (Rotaris et al., 2021), (Okada et al., 2019) |
| 4 | Government Support and Policy | a. | policies and investments, charging infrastructure layout and planning, and operation and safety services are consumer considerations for the adoption of electric trucks<br>b. advanced dynamic subsidy and taxation policies can improve charging infrastructure and economic efficiency.<br>c. Government policies such as free licenses and at-home charging facilities significantly influence EV purchase intentions in China. | Establishment of cooperation with the government in terms of investment and planning of electric truck charging infrastructure, for example, on provincial roads, in ports and in industrial areas.<br><br>Providing incentives in the form of lower taxes for the purchase of electric trucks and granting free licenses for charging facilities in the pool. | Qiao dan Raufer (2022), (Sripad & Viswanathan, 2018), (Lee et al., 2013), (Tong et al., 2021), (Li et al., 2021), (Tanco et al., 2019), (Lee & Thomas, 2017), (Mandys, 2021), (Dumortier et al., 2015), (Abotalebi et al., 2019) |

| | | | | |
|---|---|---|---|---|
| 5 | Innovation Technology Research | a. Using mobile charging trucks with V2V energy transfer can reduce reliance on stationary infrastructure.<br>b. Consumer purchasing preferences depend on the type of vehicle,<br>c. Technological innovations, such as autonomous vehicles to improve safety, are crucial in overcoming barriers to electric vehicle adoption in the growing Asian market. | Developing electric trucks with power transfer features from one truck to another.<br><br>Developing electric trucks with shared types that can be adjusted to consumer needs<br><br>Developing electric trucks with autonomous technology | Hu et al. (2018), (N. Wang et al., 2014), (Bertucci et al., 2023), (Kong et al., 2018), (Ardeshiri & Rashidi, 2020), (Kabir et al., 2021), (Fang et al., 2020), (Liimatainen, 2021), (Globisch et al., 2019), (Greene et al., 2020), (Hardman et al., 2018) |
| 6. | Logistics and Operational Needs | a. The use of electric vehicles in supply chain management and charging optimization can optimize logistics functions to reduce the operating costs of electric trucks.<br>b. A multi-criteria analysis shows that electric trucks offer significant advantages in urban delivery. | Development of sufficient charging stations<br><br>Drafting of the policy on the use of light electric trucks for urban areas | Byun dan Choi (2021), (Lou et al., 2017), (Allahmoradi et al., 2022), (Lu et al., 2020), (Xu et al., 2019), (Liao et al., 2019), (Liu et al., 2021), (Qian et al., 2019), (Nie et al., 2016) |
| 7. | Social Influence and Community Awareness | a. Social influence becomes significant when there is a positive public opinion about electric cars and the market share increases.<br>b. Social interaction has a significant role in consumer choices. | Creating a good brand experience to improve the word-of-mouth strategy in electric truck marketing.<br><br>Building customer relations through the formation of electric truck owner members with various educational events about | (Coffman, Bernstein, & Wee, 2017), (Thakre et al., 2020), (Ghasri et al., 2019), (Albrahim et al., 2019), (Madrid, 2022), (Mittal, 2023), (Moon, 2021), (Borlaug et al., 2021), (Morton et al., 2016), (Tu & Yang, 2019) |

| | | | | |
|---|---|---|---|---|
| | | c. Seller-customer interaction and positive experience value significantly affect EV purchase intent. | after-sales products and services | |
| 8. | Faktor Ekonomi dan Sosial | Vehicle leasing models are the most preferred option for BEVs. | Policies to facilitate electric truck ownership through leasing schemes. | Studi oleh Xia, Wu, dan Zhang (2022), (Tovarianskyi et al., 2022), (Mohammed & Villegas, 2023), (Sadati et al., 2022), (Qasim & Csiszár, 2021), (Peng et al., 2023), (Lyu et al., 2023), (Wątróbski et al., 2017), (Qiao & Raufer, 2022), (Moll et al., 2020) |
| 9. | Regional Promotion and Support Policy | Non-financial incentives such as dedicated lane access and free parking can increase EV adoption. | The formation of policies such as free toll access for electric trucks within a certain period. Enforcement of free parking fees for electric trucks. | (Samet et al., 2021), (Axsen et al., 2013), (W. Wang et al., 2023), (X. Wang et al., 2021) |

From the key point of our customer-centric approach, we form a model for adopting electric truck development technology. The following are the models we have developed

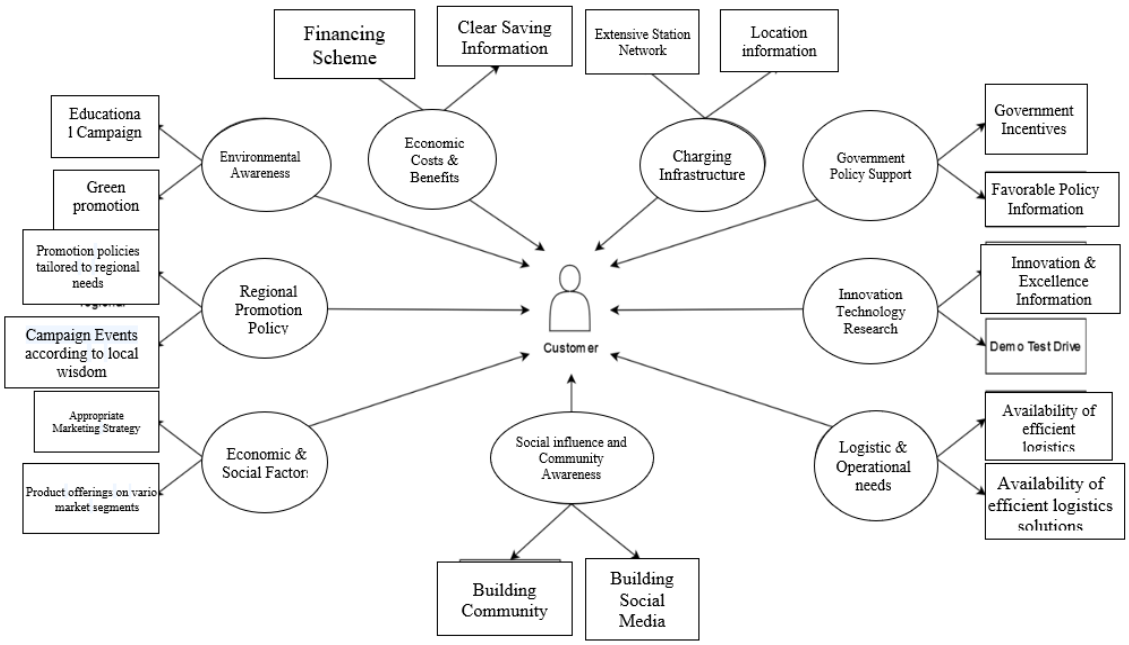



**Figure 3. Customer Centricity Approach Model for Adoption of Lisrik Truck Technology**

## Conclusion

Electric trucks are a form of innovation in the field of transportation, in general a product innovation only focuses on the development of the product itself (centric products), but from the existing problem that it is not easy to innovate electric trucks to enter the transportation market. In this study, we found a strategy to enter the market, namely with a customer-centric approach where the focus on technology development and focus on customer needs must go hand in hand so that the innovations developed in accordance with consumer preferences to adopt technological innovations, thus market acceptance will be easier.

There are nine keys to implementing a customer-centric approach, including focusing on Environmental Awareness and Awareness, Economic Costs and Benefits, Charging Infrastructure, Government Support and Policies, R&D, Technology and Innovation, Logistics and Operational Needs, Social Impact and Community Awareness, Economic and Social Factors, and Regional Promotion and Support Policies. These key points are the main needs of consumers to adopt electric vehicles in the freight transportation segment. By implementing customer centricity, it is hoped that electric vehicle manufacturers in the freight transportation segment will find it easier to enter the market and products will be easier to be accepted by the market.

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