

THE STUDY ON IMPACT OF CUSTOMER PERCEPTION ON MARKET SUSTAINABILITY OF EVs...

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ABSTRACT

This study investigates the impact of customer perception on the market sustainability of electric vehicles (EVs) in Okinawa. By analysing the attitudes, beliefs, and decision-making factors of potential EV customers and current EV owners, the study aims to understand how customer perceptions influence EV adoption and long-term viability. The research adopts a mixed-methods approach, incorporating surveys, interviews, and existing data sources to gather insights from a diverse sample of participants. The findings reveal that positive perceptions related to environmental benefits, cost-effectiveness, and technological advancements drive EV adoption, while concerns surrounding charging infrastructure, range anxiety, and vehicle performance hinder market growth. The study suggests strategies such as developing charging infrastructure, implementing government incentives, conducting awareness campaigns, fostering collaborations, and promoting continuous innovation to enhance market sustainability. The outcomes of this study provide valuable insights for policymakers, manufacturers, and other stakeholders to address customer concerns and promote EV adoption in Okinawa and beyond, contributing to a more sustainable transportation ecosystem.

Keywords: - Customer Perception, EVs, & Market Sustainability

INTRODUCTION

There have been global initiatives to reduce global warming by two degrees Celsius by 2050. Switching to electric passenger vehicles, which generate no tailpipe emissions, is one of the most promising efforts. However, if the electricity used to power these vehicles is derived from fossil fuels, the expected outcome may not be realized. We also try to depict the rebound impact by gathering data on the VMT of electric and combustion 2-wheelers running in India. Furthermore, we address the problems and potential solutions that EVs must overcome to be acknowledged as sustainable.

In Bengaluru, several electric two-wheeler businesses have risen, providing a selection of electric bikes and scooters. Ather Energy and Simple Energy are two notable startups in the city that have become well-known for their innovative electric two-wheelers. To meet the needs of urban commuters, these businesses have concentrated on creating highperformance electric scooters with innovative features and greater ranges.

Bengaluru is also home to several startups and companies in the EV sector, including electric vehicle manufacturers, charging station providers, and mobility service providers. These companies are contributing to the growth of the EV ecosystem in the city. In terms of charging infrastructure, Bengaluru continues to grow its network of charging stations, including private and public charging points. There are various charging options available, such as slow charging and fast charging to meet their demands different EV models.

The demand for electric two-wheelers as a sustainable and practical method of transportation has also been spurred by Bengaluru's tech-savvy populace and the city's traffic congestion challenges. Overall, Bengaluru's two-wheeler EV sector is experiencing growth, with more locals choosing electric scooters and motorbikes as an affordable and environmentally friendly mode of transportation.

Statement of the problem:

Customer perceptions have a significant impact on the electric vehicle (EV) market's viability and sustainability. Despite the many environmental and financial advantages of EVs, adoption still faces obstacles like range anxiety, a lack of charging infrastructure, and a high initial cost. Consequently, it is crucial to understand how people think about EVs and their effect on market sustainability of the market. To better understand the connection between consumer perception and the commercial viability of EVs, this study examines things like perceived benefits, drawbacks, and general satisfaction with EVs. By identifying key variables of consumer opinion and their influence on the EV market, this study gives insights on how to increase the adoption and sustainability of EVs.

Review of Literature:

- **Bhalla, Salamah Ali & Nazneen (2018)** have examined to study Commercial success and purchase intention of electric vehicles by Indians, there is a need to study the factors influencing the consumer acceptance of these vehicles. Based on the analysis, electric vehicle manufacturers and Government of India have to invest more on social acceptance of the vehicle by creating more infrastructural facilities, putting more thrust on technology.
- **Yang, Zhang, Jing Fu, Fan & Yu Ji (2018)** based on the analysis of relevant research at home and abroad, the consumer behavior of EVs is investigated and the factor analysis is used to simplify the feature categories, in order to obtain consumers' behavior characteristics of EVs. According to the characteristics of consumer behavior of EVs, suggestions are put forward to cultivate the EV market from the aspects of existing technology and potential future technology of EVs.
- **Chidambaram , Ashok, vignesh, Deepak, Ramesh, Narendhra, Usman & Kavitha (2022)** this article investigates the barriers and infers the comparative order of resolution for each barrier based on its priority to be identified and overcome. As consumers are the major influencers of electric vehicle demand and acceptance, barrier analysis is carried out based on their opinions. Using a Consumer Perception Survey, this article determines the influence of each barrier on potential users of electric vehicles. Fuzzy Stepwise Weight Assessment Ratio analysis and TOPSIS are implemented to allocate evaluation factors to each sub-barrier to obtain the hierarchy of priority.
- **Huang & Qian(2022)** to the sustainable innovation literature by exploring the psychological antecedents to, and mediator of, the psychosocial view in consumers' adoption of EVs in different business models. Our work has significant value for green marketing and public policies of sustainable innovations.
- **Lashari, Joonho Ko & Jang (2021)** as examined EVs tend to be more comfortable as they produce little vibration and noise [6]. Owing to these benefits, EVs have gradually been recognized as promising alternatives to combustion engine vehicles, and therefore, promoting the purchase and use of EVs can potentially have a large positive impact on the environment and energy systems at both the global and local levels.
- **Haonan He a , Chao Wang a ,Wang b, Fei Ma a , Sun a & Zhao (2021)** the popularity of EVs has been expanding rapidly, thanks to government subsidies, extended driving ranges, and growing ecological awareness, global cumulative sales of EVs represented only about 5 out of every 300 new vehicles sales in 2019.1 Meanwhile, as the leader in EV adoptions worldwide by a great margin, sales in China's EV market have dropped continuously since Beijing slashed subsidies for EV customers in July 2018.2 This slump is increasingly revealing of the over-reliance on subsidy policy and the lack of fostering of ecological awareness in EV development.
- **Huang ,Qian ,Soopramanien&Tyfield(2021)**Critical service and policy attributes include home charging capability, vehicle licensing policy, and the density of battery swapping stations for the battery-leasing model. We also find that female consumers, those who are well-educated, and those who have a pro-EV attitude are most likely to adopt EVs in innovative business models. Our work has significant value for companies and government in terms of better designing and supporting the innovative business models for EV adoption.
- **Huang, Lin, Zhou, Lim,& Chen,(2021)** the results show that the current consumers prefer plug-in hybrid electric vehicles and their attitude towards electric vehicles is more negative. A hybrid policy consisting of government subsidies and charging facility construction is the most effective strategy, where subsidies help stabilize consumption and charging facility construction facilitates the rapid electrification of vehicles in the current market.
- **Yueling Xu, Zhang ,HaijunBao,Zhang& Xiang (2019)** this study aims to contribute toward streamlining marketing and planning activities to introduce strategic policies that stimulate the purchase and use of BEVs. This study considers the nature of human behavior by extending the theory of planned behavior model to identify its predictors, as well as its non-linear relationship with customers' purchase intention. To better understand the predictors, a substantial literature review was given to validate the hypothesis.
- **Müller (2019)** as analysed the novel approach to integrate three different technologies within the Technology Acceptance Model requires unifying items to a level which makes them comparable, limiting the results for each individual technology.

SCOPE OF THE STUDY:

This study aims to analyze the impact of customer perception on the market sustainability of electric vehicles (EVs) in Okinawa. It will examine the attitudes, beliefs, and decision-making factors of potential EV customers and current EV owners in Okinawa.

The study will focus on factors such as environmental concerns, cost-effectiveness, charging infrastructure, range anxiety, and vehicle performance. Data will be collected through surveys, interviews, and existing data sources, and analyzed to identify patterns and correlations. The study will provide recommendations to enhance market sustainability, including strategies for charging infrastructure development, government policies, community engagement, collaborations, and innovation in EV technology.

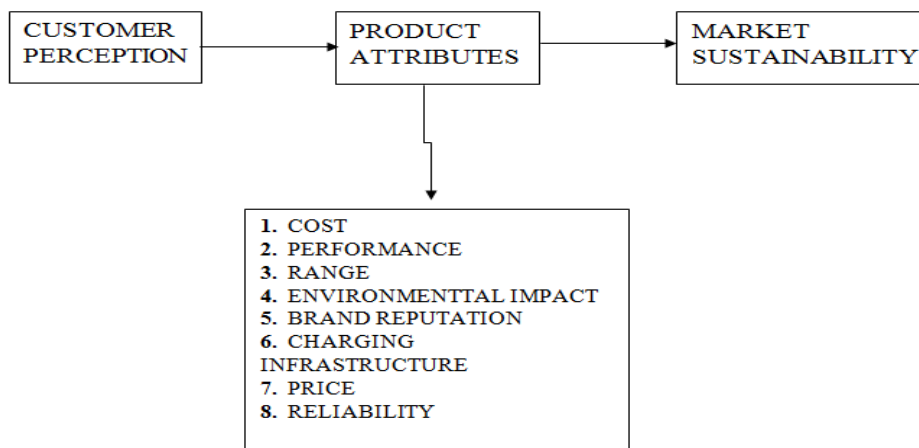
OBJECTIVE:

1. To identify factors influencing customer perception of EVs.
2. To analyze strategies to improve EV adoption by improving customer perception.
3. To understand factors that impact market sustainability of EVs.
4. To examine the relationship between customer perception and market viability of EV's for market sustainability

HYPOTHESIS

H0: There is no significant relationship between customer perception and market viability of EV's.

CONCEPTUAL FRAMEWORK OF CUSTOMER PERCEPTION OF EV's FOR MARKET SUSTAINABILITY



DATA ANALYSIS AND METHODOLOGY

Non-Probability Techniques, Convenience Sampling methods have been adopted to study the customer perception of EV users. As it is a quantitative study, questionnaire has been used to collect data. To analyse the relationship between Customer Perception and Market viability of EVs

Annova						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	50.309	1	50.309	55.173	.000 ^b
	Residual	93.920	103	.912		
	Total	144.229	104			
2	Regression	55.586	2	27.793	31.982	.000 ^c
	Residual	88.642	102	.869		
	Total	144.229	104			

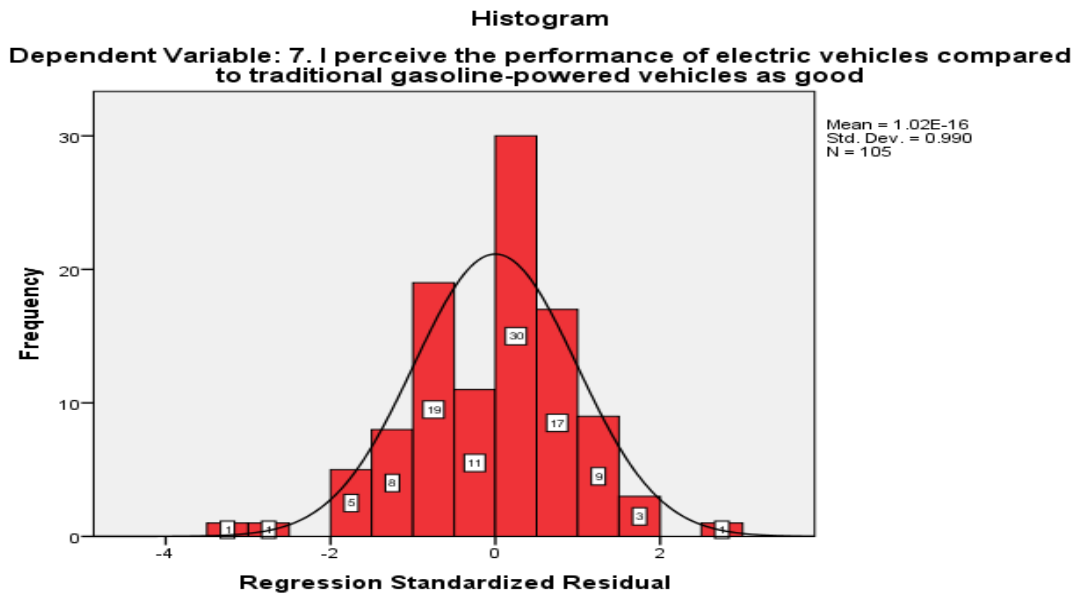
a. Dependent Variable: 7. I perceive the performance of electric vehicles compared to traditional gasoline-powered vehicles as good

b. Predictors: (Constant), 17. The price range is the deciding factor in the purchase of an electric vehicle

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.210	.269		4.493	.000
	17.The price range is the deciding factor	.574	.077	.591	7.428	.000
2	(Constant)	.949	.283		3.348	.001
	17.The price range is the deciding factor	.426	.096	.438	4.416	.000
	10.The availability of charging infrastructure	.223	.090	.245	2.464	.015

a. Dependent Variable: 7. I perceive the performance of electric vehicles compared to traditional gasoline-powered vehicles as good



Interpretation: The results of the analysis show that the price range of electric vehicles has a substantial impact on how their performance is perceived. A more favourable perception is linked to a higher priority given to the price range. According to the second model, perception is similarly affected by the availability of charging infrastructure, with limited availability being associated with a more favourable view. These results imply that people are more likely to view the performance of electric vehicles to be good when they prioritize price range and take charging infrastructure availability into account.

LIMITATIONS OF THE STUDY

1. Sample bias may influence the findings.
2. Generalize ability beyond Okinawa may be limited.
3. Constraints in data collection methods may impact accuracy.

FINDINGS:

1. Positive consumer perceptions of electric bikes (EVs) in terms of performance, dependability, environmental advantages, and cost-effectiveness are crucial for their market viability.
2. Okinawa's solid brand reputation and consumer perceptions of dependability, durability, and brand reputation play a significant role in the commercial viability of their electric scooters.
3. Favourable consumer impressions of Okinawa's environmentally friendly electric scooters, with a smaller carbon footprint and fewer emissions, can drive market expansion and sustainability.
4. Okinawa's competitively priced electric scooters, which demonstrate the company's commitment to accessibility, can attract customers who view EVs as cost-effective.
5. Okinawa's focus on zero-emission electric scooters aligns with consumers' increasing environmental consciousness, contributing to the feasibility of EV sales in Bengaluru.
6. Developing high-performance electric scooters that match or surpass conventional scooters can positively impact consumer perception and promote market sustainability for Okinawa.
7. Okinawa's efforts to offer competitively priced electric scooters, along with reduced fuel and maintenance costs, can improve customer perception and support long-term market viability for EVs.
8. The availability of post-sale service and assistance, along with effective customer support and easily accessible spare parts, can enhance customer satisfaction and support for Okinawa's electric scooters.

CONCLUSION:

In conclusion, positive consumer perceptions are crucial for the market viability of electric vehicles (EVs), including Okinawa's electric scooters. Okinawa has established a solid brand reputation with consumers perceiving their electric scooters as dependable, durable, and environmentally friendly.

The survey of 105 respondents indicates that consumers value EVs for their performance, dependability, environmental advantages, and cost-effectiveness. Okinawa's competitively priced electric scooters, coupled with potential cost savings in fuel and maintenance, enhance the perceived cost-effectiveness of EVs. The company's focus on zero-emission electric scooters aligns with the increasing environmental consciousness of consumers, particularly in regions like Bengaluru. The development of high-performance electric scooters by Okinawa further improves consumer perception and promotes market sustainability. Additionally, Okinawa's commitment to post-sale service, customer support, and easily accessible spare parts enhances customer satisfaction and support for their electric scooters. Overall, these factors contribute to the market viability of Okinawa's EVs.

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