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Research Article

Consumer Perception towards Electric Vehicles in Emerging Markets

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ABSTRACT

This research aims to understand customer awareness, perceptions, and purchasing decisions regarding electric vehicles (EVs) in emerging markets like India. Using surveys, interviews, and brand evaluations, the study identifies key factors influencing EV adoption. It highlights the need for innovative advertising, a focus on green technology, and continuous brand evolution to stay competitive. The study explores consumer preferences, motivations, and challenges, offering insights into the dynamics of EV adoption. Additionally, it applies Innovation Diffusion Theory to explain how innovative products, like EVs, gain acceptance in the market. By shedding light on consumer behaviour towards specific EV brands, the research provides valuable information to improve strategies for promoting sustainable transportation and increasing EV adoption.

Keywords: Consumer perception; Electric vehicle; Emerging markets; Retail.

INTRODUCTION

1.1 Consumer perception towards electric vehicle

Consumer perception towards electric vehicles is evolving as technological advancements, policy initiatives, and societal attitudes continue to shape the automotive landscape. While challenges remain, the increasing emphasis on sustainability and the transition towards clean energy sources are driving a more positive outlook on EVs among consumers worldwide. Consumer perception towards electric vehicles (EVs) varies depending on a multitude of factors including geographic location, cultural context, economic status, technological awareness, and environmental concerns. Many consumers perceive EVs as a more environmentally friendly alternative to traditional internal combustion engine vehicles. This perception stems from the belief that EVs produce zero tailpipe emissions, reducing air pollution and greenhouse gas emissions, thus combating climate change. However, perceptions may vary based on the source of electricity used to charge EVs, with renewables being viewed more favourably than fossil fuels. the perception of EVs being expensive compared to conventional vehicles was widespread. However, as technology advances and production scales increase, the cost of EVs has been steadily decreasing. Additionally, factors such as fuel savings, maintenance costs, and government incentives can alter consumer perceptions of the overall cost-effectiveness of EVs. Will awareness on EV improves purchase intentions of consumers?(Rq1).How government initiatives through subsidies help in purchasing EVs.(Rq2).

The technical specifications of electric vehicles (EVs) are significantly different from those of vehicles powered by internal combustion engines (ICEs). EVs present unique considerations such as range, pricing disparities, operational expenses, refuelling patterns, and claimed environmental advantages, setting them apart from traditional vehicles. Some experts even classify EVs as a form of disruptive innovation due to these distinctions. However, due to the relatively low sales volumes of EVs and their distinct features, it's difficult to accurately predict consumer responses based on current market conditions. Nevertheless, gaining a thorough understanding of how consumers react to EVs is crucial for their widespread adoption in the future.

1.2 *Overview of electric vehicle industry*

The global electric vehicle (EV) market is rapidly growing, with a notable increase from 4.2% to 8.3% in 2021, totalling 6.75 million vehicles. This marks a 108% rise from 2020. The surge, attributed to environmental benefits, sees

significant growth in India, with a 168% year-on-year increase in 2021, totalling approximately 0.32 million EVs sold. India's adoption aligns with the Paris Agreement's goals for carbon reduction, air quality improvement, and reduced oil imports as given in Fig.-I

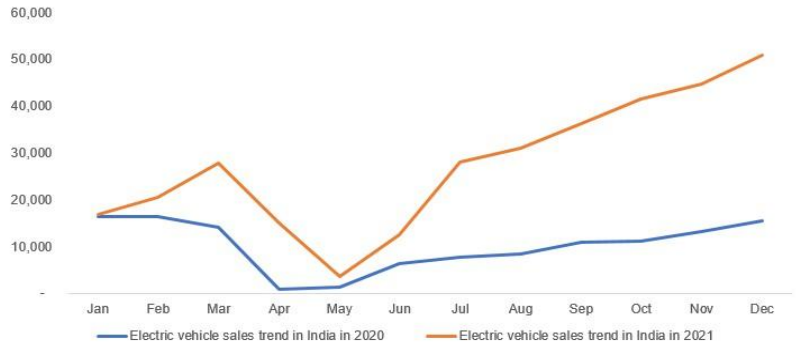

Fig.-I Graph: Electric Vehicle Sales Trend in India (2020-21)

India's auto sector, set to lead globally by 2030, eyes surpassing the U.S. The India Energy Storage Alliance forecasts a 36% CAGR for the EV market. To reduce 80% dependency on imported crude oil, India targets aggressive EV adoption by 2030: 70% for commercial, 30% for private vehicles, 40% for buses, and 80% for two- and three-wheelers. This aligns with the net-zero carbon goal by 2070. The Ministry of Heavy Industries reports 0.52 million EV registrations in the last three years, with substantial 2021 growth, driven by government policies and initiatives. Because close to 0.32 million vehicles were sold in 2021, an increase of 168% YoY, the Indian EV sector is likewise developing quickly(Goswami, 2022). The Paris Agreement, which aims to reduce carbon emissions, improve the quality of the air in urban areas, and decrease oil imports(Ona and Long,2012) is the foundation for India's ongoing adoption of electric vehicles.

Despite the rapid growth and potential of India's electric vehicle (EV) sector, several critical research gaps hinder a comprehensive understanding of consumer adoption and market dynamics. First, while government initiatives have boosted EV registrations, there is a lack of detailed insights into consumer awareness and understanding of EV technology, benefits, and available models, necessitating research to identify misinformation and knowledge gaps. Additionally, current studies often treat the consumer base as a homogeneous group; thus, research should segment consumers by demographics, socio-economic status, and geographic location to better understand diverse purchasing behaviours and attitudes towards EVs. The influence of policies and regulations also remains underexplored, with limited analysis on how specific measures like, subsidies, tax incentives, and charging infrastructure investments—directly affect consumer decision-making and adoption rates. Furthermore, despite reported growth in EV sales, significant barriers such as range anxiety, charging infrastructure availability, and high initial costs persist, highlighting the need for research to quantify these obstacles and assess their impact on various consumer segments. The role of brand perception in influencing purchasing decisions is another underexplored area, as understanding how brand trust and marketing strategies affect consumer choices could provide valuable insights for manufacturers like Tata, Mahindra, Hyundai, and MG Motors. Additionally, there is a lack of comparative analyses with global markets, which could illuminate the unique challenges and opportunities faced by emerging markets like India. Addressing these gaps is crucial for developing effective strategies to enhance EV adoption in India, ultimately contributing to the country's economic growth, energy security, and environmental sustainability goals.

The automotive industry holds promise as a means to enhance economic opportunities and bolster energy security. The widespread adoption of electric vehicles (EVs) stands to significantly impact air quality. Consequently, numerous nations have prioritized the development of EVs to reduce reliance on oil and mitigate environmental harm. Among EVs, battery electric vehicles are particularly hailed as a solution to both energy crises and environmental concerns. As the automotive industry endeavours to lead in EV sales, the focus has shifted towards maximizing benefits. Advancements in higher-capacity batteries are poised to enhance the efficiency of fast charging technology, thereby offering a potent method of charging. Tata ,Mahindra ,Hyundai and MG motors are leading brands in electric car segments in emerging markets like India.

In recent years, growing consumer interest in electric vehicles (EVs) has emerged, driven by environmental concerns, fluctuating fossil fuel prices, and technological advancements. Despite increased EV availability, consumer adoption

remains slow, influenced by factors like range anxiety and lack of awareness. This research focuses on understanding consumer behaviour towards EVs, exploring factors impacting purchasing decisions, awareness, and perceptions across different consumer segments. The study also delves into various purchasing decisions and conducts analysis of selected EV brands. Research tries to explain the consumers behaviours towards purchase of electric vehicle through application of diffusion of innovation theory and social cognitive theory.

Current research on consumer purchase behaviour towards electric vehicles plays a critical role in advancing the transition to sustainable transportation by informing policy, industry practices. Therefore, research provides insights into the effectiveness of policies and regulations aimed at promoting EV adoption, such as subsidies, tax incentives, emissions regulations, and infrastructure investments. Research will also help to identify the barriers that hinder consumer adoption of EVs, such as range anxiety, charging infrastructure availability, high purchase costs, and limited model availability. There is a research gap regarding the factors influencing the adoption of EVs in emerging markets like India. By undertaking a thorough this study seeks to close several information gaps.

The purpose of this research is to investigate consumer behaviour towards electric vehicles (EVs) in the Indian market, aiming to understand the factors that influence awareness, perception, and purchasing decisions among various consumer segments. Given the growing interest in EVs driven by environmental concerns and technological advancements, yet tempered by barriers such as range anxiety and high costs, this study seeks to explore these dynamics in depth.

Utilizing the diffusion of innovation theory and social cognitive theory, the research will analyse how these frameworks can elucidate consumer attitudes and behaviours regarding EV adoption. By examining the effectiveness of existing policies and regulations, such as subsidies, tax incentives, and infrastructure investments, the study aims to provide valuable insights for policymakers and industry stakeholders. Additionally, it will identify key barriers to adoption, including the availability of charging infrastructure and the variety of models offered.

Ultimately, this research addresses a significant gap in understanding consumer behaviour towards EVs *in emerging markets like India*, providing a comprehensive analysis that can guide future strategies for promoting sustainable transportation and enhancing consumer adoption of electric vehicles.

The rest of the study is structured as follows: Literature review , theoretical background, which presents the proposed integrated model and the hypotheses, methods, and results, discussion, and conclusion.

LITERATURE REVIEW

2.1 Factors affecting purchase intentions of electric vehicle

The literature review on factors affecting the usage intention of EVs includes several studies that have identified various factors, such as environmental concerns(Bhat et al,2022), financial incentives(Gunawan et al,2022), vehicle range anxiety(Huang et al ,2021) due to technology , charging infrastructure (Higueras-Castillo et al,2022) ,Social Influence (Bhat et al,2022;Featherman et al. 2021; Abbasi et al., 2021;and sociodemographic factors (Singh et al., 2023), as significant determinants of EV usage intention. Several European countries have offered incentives for purchasing EVs, such as tax breaks (Loengbudnark et al,2022) and subsidies(Higueras-Castillo,2023). *However, it lacks an Indian context and overlooks consumer awareness, perceptions, hedonic values and a comparative analysis of electric vehicle brands*. Previous research found that performance expectancy is instrumental in positively influencing the intention to purchase EVs (Klöckner, 2014;Jain et al., 2022; Manutworakit, & Choocharukul,2022).Moreover ,non- awareness on electric vehicle in terms of cost advantage in terms of comparison between different vehicle , environment, hedonic values are the gaps identified as given table 1.

Table-1 :Summary of Literature review

Author	Theory	Place	Key areas	Gaps
Singh et al. (2023)	UTAUT2, NAM	India	Performance expectancy, facilitating conditions, hedonic motivation, price value, and personal norms	Consumer awareness, Hedonic value , Comparison between EV Vehicle, IDT- innovation diffusion theory
Bhat et al. (2022)	UTAUT	India	Environmental enthusiasm, technological enthusiasm, social image, social influence, perceived benefits, and performance expectancy ,	Consumer awareness; Comparison between EV Vehicle , Hedonic value, IDT- innovation diffusion theory

Gunawan et al. (2022)	UTAUT2, TPB	Indonesia	Attitude towards use, performance hedonic motivation, price value, functional, financial, and social risks	Consumer awareness; Comparison between EV Vehicle, IDT- innovation diffusion theory
Higueras-Castillo et al. (2022)	TRA	Spain	word-of-mouth communication, care of environmental consequences, and personal innovativeness,	Consumer awareness; Comparison between EV Vehicle, Hedonic value
Loengbudnark et al. (2022)	TAM	Australia	Safety concerns purchase cost and perceived benefits	consumer perceptions preferences, and economic
Manutworakit and Choocharukul (2022)	UTAUT	Thailand	Performance expectancy, effort expectancy, social influence, hedonic motivation, and environmental concern,	Consumer awareness; Comparison between EV Vehicle
Abbasi et al., (2021)	UTAUT	Malaysia	Social influence, technophilia, perceived environmental knowledge,	Consumer awareness; Comparison between EV Vehicle; Hedonic value
Featherman et al. (2021)	TRA, RBM	USA	Perceived benefits and risks, as well as social influences, EVs	Consumer awareness; Comparison between EV Vehicle, Hedonic value, SICT- self-image congruence theory
Huang et al. (2021)	Extended TAM	China	Consumer technological knowledge	Consumer awareness; Comparison between EV Vehicle, Hedonic value, SICT- self-image congruence theory

(EV- electric vehicle, UTAUT- unified theory of acceptance and use of technology, NAM- norm activation model ; TPB- theory of planned behaviour ; TRA -theory of reasoned action ; TAM- technology acceptance model, ; RBM- risk–benefit model)

APPLICATION OF THEORIES

Several theories can help to explain the consumer adoption of electronic vehicle**.** Unified theory of acceptance and use of technology, norm activation model and theory of planned behaviour have been used in the past to explain the consumer behaviour towards electronic vehicle purchase intentions. Emerging markets like India has just opened up to electric vehicle. There is less awareness and knowledge of electric vehicle which will motivate the consumers to show purchase intentions. Therefore, Innovation diffusion theory (IDT) is selected to explain the consumers behaviour on awareness and their purchase intentions

Innovation Diffusion theory :Developed by Everett Rogers(1962), this theory posits that the adoption of innovations, such as EVs, follows a predictable pattern characterized by stages including awareness, interest, evaluation, trial, and adoption. Factors such as relative advantage, compatibility, complexity, observability, and trialability influence the rate of adoption among consumers. It emphasizes the role of innovators, early adopters, early majority, late majority, and laggards in the adoption of innovations. Understanding the characteristics and motivations of each adopter category can help explain the diffusion of EVs among different consumer segments.

Innovation Diffusion Theory, developed by Everett Rogers in 1962, provides a framework for understanding how new technologies, such as electric vehicles (EVs), are adopted by consumers over time. According to this theory, the adoption process occurs in a series of stages:

Awareness: Potential adopters first become aware of the innovation. This stage is crucial for creating interest and is often influenced by marketing and communication strategies.

Interest: After awareness, individuals express curiosity and seek more information about the innovation, leading to a deeper understanding of its benefits.

Evaluation: In this stage, potential adopters assess the innovation against their needs and circumstances. They consider factors such as the relative advantage (benefits compared to existing options), compatibility (how well the innovation fits with existing values or practices), complexity (ease of use), observability (visibility of benefits to others), and trialability (possibility to experiment with the innovation before full adoption).

Trial: Potential adopters might try out the innovation on a limited basis, which can help alleviate concerns and showcase its value.

Adoption: Finally, the individual decides to fully integrate the innovation into their life or business.

Rogers (1962) also categorizes adopters into five groups:

- Innovators: The first individuals to adopt the innovation, often willing to take risks.
- Early Adopters: These individuals are more socially connected and help influence others through their endorsement of the innovation.
- Early Majority: This group adopts innovations after seeing the benefits validated by early adopters, reflecting a more cautious approach.
- Late Majority: Sceptical individuals who adopt only after the majority has embraced the innovation.
- Laggards: The last to adopt, often resistant to change and influenced by tradition.

Understanding these categories helps businesses and policymakers tailor strategies to facilitate the diffusion of EVs among different consumer segments, addressing specific barriers and leveraging motivations unique to each group. By recognizing the diverse perspectives and needs of potential adopters, stakeholders can more effectively promote the benefits of EVs and accelerate their acceptance in the marketplace.

3.1 Social Cognitive Theory :Social Cognitive Theory, proposed by Bandura, focuses on an individual's learning through dynamic, reciprocal, and continuous interactions between the environment and themselves (Bandura, 1998). This theory highlights the reciprocal interaction between individuals, their behaviour, and the social environment. In the context of EV adoption, observational learning (e.g., seeing others use EVs), social norms, and self-efficacy (belief in one's ability to successfully adopt and use EVs) can influence consumers' decisions to adopt EVs.

Albert Bandura (1998) established the Social Cognitive Theory, which highlights the complex relationships that exist between an individual and their environment. It proposed that learning happens as a result of ongoing, reciprocal interactions between an individual's behaviour, social circumstances, and personal characteristics. According to this view, people actively interact with their environment, both shaping and being moulded by their experiences, rather than being passive learners. Adoption of electric vehicles (EVs) is influenced by a number of important factors. When prospective adopters witness others using EVs effectively, they are more likely to be inspired to embrace the technology themselves.

Additionally, self-efficacy is crucial; when consumers believe they have the ability to understand, use, and benefit from EVs, they are more likely to take the leap toward adoption. By fostering a supportive environment that enhances observational learning, aligns with positive social norms, and builds self-efficacy, stakeholders can significantly influence consumer decisions regarding EV adoption, ultimately facilitating a broader transition to sustainable transportation.

DEVELOPING THEORETICAL CONSTRUCT AND HYPOTHESIS

Purchase intention is the dependent variable and Consumer awareness is the independent variables in the study. However, the purchase intention is moderated by comparison between EV Vehicle based on data and Hedonic value of consumers. These are based on gap analysis of previous research done . Study examines the relationship between consumer awareness and purchase intention for electric vehicles (EVs), with moderating factors influencing this relationship. Mathematical construct suggests that purchase intention (Pi) is a function of several variables:

$$Pi \alpha Ba+Vc+Hv+Si$$

(Pi=purchase intention; Ba=brand awareness; Vc=Vehicle comparison data ;Hv=Hedonic value; Si=Social Influence)

This equation implies that purchase intention increases with higher levels of brand awareness, effective vehicle comparison, greater hedonic value, and stronger social influences. The relationship between consumer awareness and purchase intention may not be direct but influenced by the other variables. For example, high consumer awareness might only lead to increased purchase intention if consumers find the hedonic value of EVs appealing or if they receive positive social reinforcement. The impact of social factors, such as peer opinions and social trends, on consumer decision-making. Social influence can moderate the relationship between awareness and purchase

intention, as individuals may be swayed by what others think about EVs. Similarly, high hedonic value can enhance purchase intention, as consumers may be drawn to the enjoyment or status that comes with owning an EV.

4.1 Hypothesis development

Performance expectancy, facilitating conditions, hedonic motivation, price value, and personal norms were critical factors which motivated the purchase of electronic vehicle(Singh et al. (2023). However, Safety concerns purchase cost and perceived benefits as mentioned by Loengbudnark et al. (2022) may also play a role .Therefore, awareness on electric vehicle may lead to more openness and interest among consumers. Hence , the following hypothesis is proposed for the study

H1:*Awareness of consumers through campaign will lead to more purchase intention due to reduced apprehension of risk*

Attitude towards use, performance hedonic motivation, price value, functional, financial, and social risks(Gunawan et al. 2022) play a role in influencing the consumer to compare and take a decision on purchase for electric vehicle. Price value subsidised by government may augment in decision making process of the consumers. Social influence and hedonic value (Abbasi et al., 2021;Manutworakit and Choocharukul,2022) may influence the purchase intentions. Technical knowledge(Huang et al. 2021) communicated on electric vehicle may make the consumers to take active interest and compare the different options available before taking a purchase decision.

H2. *Consumers are more likely to compare costs and purchase electric vehicles when influenced by hedonic value and social factors.*

METHODOLOGY:

5.1 *Research Design*:

Research design is multifaceted, reflecting both descriptive and exploratory approaches to understanding consumer behaviour towards electric vehicles (EVs). The primary aim of research was to describe consumer buying behaviour toward selected brands of electric vehicles. Descriptive research was essential for establishing a clear picture of how consumers perceive EVs, their purchasing intentions, and the factors influencing these behaviours. This involved in the collection of quantitative data that can illustrate trends, patterns, and correlations in consumer preferences. Structured questionnaires were employed to gather data directly from consumers regarding their awareness, attitudes, and intentions related to EVs. Since electric vehicles are relatively new in the market and their adoption may vary by region, this qualifies as an exploratory endeavour. This exploratory element through was crucial as it uncover insights and nuances in consumer perceptions that may not yet be well-documented in existing literature. Surveys was designed to capture consumer attitudes towards EV brands, perceptions of brand awareness, and the influence of social factors. Tools like Likert scales were used to quantify responses and facilitate analysis.

However, secondary data are collected in some portion of the research based on various research databases and journals, Govt. sources, websites, published documents, public records, business documents, historical and statistical documents etc. Research design was well-suited to explore the complexities of consumer behaviour towards electric vehicles. By combining descriptive and exploratory methods and utilizing both primary and secondary data, it helped to gain valuable insights on the EV market.

5.2 *Sample design*: A combination of snowball sampling and stratified sampling techniques were used to gather data from Mumbai residents who own vehicles. Mumbai is financial capital of India (Srivastava,2022).Therefore, Mumbai was selected as it represents mini-India(Srivastava,2022). Total 389 participated in the study. The sample consists of a notably higher percentage of males (71%) compared to females (29%). In terms of education, a large majority (84%) hold graduate or postgraduate degrees, with an average monthly income of one hundred thousand rupees. The survey was conducted between March and April 2023.Sample size is adequate as per Hair et al(2010)

.**5.3 *Questionnaire design***: This research is primarily conducted based on the data collected from primary sources where field surveys as well as online surveys are conducted to gather primary data. An online Google form is distributed among consumers using electric vehicles. Brand Awareness was measured as per study of Srivastava,(2022),Hedonic value (Gunawan et al. 2022); Social influence(Abbasi et al., 2021);Purchase intention(Srivastava ,2022);Perceived risk(Loengbudnark et al. 2022).Likert scale of 1-7 were used for measurement. Reliability test revealed that Cronbach's Alpha Based on Standardized Items was .833 with Kaiser-Meyer-Olkin Measure of Sampling Adequacy.-.836

6.RESULTS :

It is divided in to two parts -Descriptive and hypothesis testing :

6.1 ***Descriptive***

The analysis of number of consumers thinking of purchasing in the next six months are given below:

Table2:Price range and brand to be purchased in the next six months

Price range in Rupees (Rs. 85=$1)	N(389)	Percentage
Less than 10 ,0000	89	23
10,0000-20,0000	124	32
210000-30,0000	109	28
More than 30,0000	67	17
	389	100
Brand		
Tata car	121	31
Mahindra car	51	13
Hyundai car	47	12
MG car	42	11
Others(Two-wheeler electrical)	128	33

The data above can be used to segmentize future target audience of EV. Entry level electric vehicle below Rs .100000(Rs.85=1$) will be accepted as per present study. This price range has emerged from consumer's feedback and therefore will be extremely useful to marketers. Brand names come to respondents' mind first were Mahindra car followed by Tata, MG and Hyundai car. MG and Hyundai are global brands. Local Indian Brands are dominating the Indian Markets due to cost advantage and offering value for money.It can used to understand customer perception and position the EV vehicles. Tata and Hyundai car are most active in creating awareness among the Indian consumers. This could the possible reason for better penetration among Indian Consumers. *Awareness has influenced the purchase decision as per present data (H1).*

The second part of analysis relates to perception of these electric vehicle as given below in Table-3

Table3*:* When respondents think of their brand, what words came to their mind? (N=389*)*

Parameters	Tata(N)	Rank	Hyundai(N)	Rank	MG(N)	Ranks	Mahindra(N)	Ranks
Eco friendly	75	2	65	2	88	1	66	1
Convenient	45	3	45	5	45	4	45	5
Reliable	77	1	76	1	24	8	65	2
Innovative	45	3	32	6	33	5	33	7
High-Tech	35	5	17	9	59	2	55	4
Expensive	20	7	51	4	32	6	61	3
Fun to drive	31	6	22	7	31	7	11	8
Quiet	40	4	21	8	56	3	34	6
Sustainable	12	8	7	10	12	9	10	9
Cutting -edge	10	9	54	3	10	10	10	9

It can used to develop marketing campaigns for the brands. Awareness campaign based on their SWOT analysis will help to change the perception and improve the purchase intentions.

All the four models are ecofriendly and rated high with MG(Global) and Mahindra (Local) brand taking a lead compared to Tata (Local) and Hyundai (Global). Similarly, both MG(Global) and Mahindra (Local) are considered to be higher tech compared to Tata and Hyundai brands of cars. Indian consumers are more concern for value for money (Srivastava,2022). Therefore, while hedonic value and social factors do influence purchase intentions Indian consumers are likely to compare the cost as per our study(H2).

The next analysis relates to post purchase feeling after the purchase of the car as given in table-4

Table4: Post purchase experience(N=389)

Parameters	Tata(N)	Rank	Hyundai(N)	Rank	MG(N)	Ranks	Mahindra(N)	Ranks
Sense of pride	97	1	76	3	78	2	56	5
Reducing carbon foot print	88	2	66	4	45	5	67	3
Supporting more sustainable future	75	3	78	2	66	4	87	1
Sense of excitement and innovation	39	6	45	5	71	3	61	4
Financially stability -social factor	45	5	81	1	88	1	76	2
Emotional fulfilling	46	4	44	6	42	6	43	6

The purchase of an electric vehicle encompasses a wide range of benefits, from environmental stewardship to technological innovation and personal fulfilment. It represents a holistic commitment to sustainability, innovation, and societal progress as felt by consumers who purchased electric vehicle. Beyond the practical advantages, owning an electric vehicle can evoke deep emotional attachment. Knowing that one is making a positive impact on the planet and future generations can bring a sense of purpose and satisfaction. It aligns personal actions with broader values, resulting in a profound sense of achievement and contentment. Consumers feeling measurement is the additional contribution to existing knowledge. This can be utilised for marketing to improve the awareness and benefit of ownership of electric vehicle.

*6.2 **Hypothesis testing***

The first hypothesis is

H1:*Awareness of consumers through campaign will lead to more purchase intention due to reduced apprehension of risk*

Z test was used to test the hypothesis. Table 5give the analysis of the same

Table-5 z-Test: Two Sample for Means

	Expected Ideal Rating	*Surveyed Rating*
Mean	10	7.366666667
Known Variance	0.000001	1.73924593
Observations	389	389
Hypothesized Mean Difference	0	
Z	39.43279104	
P(Z<=z) one-tail	0	
z Critical one-tail	1.644853627	
P(Z<=z) two-tail	0	
z Critical two-tail	1.959963985	

H2. *Consumers are more likely to compare costs and purchase electric vehicles when influenced by hedonic value and social factors.*

Z test was used to test the hypothesis. Table 6 give the analysis of the same

Table-6: Factors affecting purchase intentions -z-Test: Two Sample for Means

	Expected Ideal Rating	*Surveyed Rating*
Mean	10	8.397435897
Known Variance	0.000001	0.9239009
Observations	389	389
Hypothesized Mean Difference	0	
Z	32.92568233	

P(Z<=z) one-tail	0
z Critical one-tail	1.644853627
P(Z<=z) two-tail	0
z Critical two-tail	1.959963985

(**r square**-.883)

Since Z (calculated) > Z Critical (1.64) and P-value (0) < ∝ (0.05), hypothesis H2 accepted .

Consumers are more inclined to compare costs and ultimately buy electric vehicles when they are influenced by hedonic value (related to pleasure or enjoyment) and social factors. The hypothesis is tested by comparing calculated Z-values with a critical Z-value and evaluating the p-value. The calculated Z-value indicates the extent of the relationship between the variables being studied. In this case, it suggests the strength of the association between the influence of hedonic value, social factors, and consumers' likelihood to compare costs and purchase electric vehicles. Critical Z-value, typically derived from a standard normal distribution table, serves as a threshold for determining statistical significance. If the calculated Z-value exceeds the critical Z-value (in this case, 1.64), it suggests that the relationship between the variables is statistically significant.

DISCUSSION AND THEORETICAL CONSTRUCTION

7.1 ***Application of theories***

Individuals learn from observing others and from their own experiences. If people are not sufficiently aware of electric vehicles and their benefits, they may be less likely to consider purchasing them. However, the results indicate that increasing awareness through an awareness campaign could positively influence purchase intentions. Increasing awareness about electric vehicles may enhance individuals' confidence in their ability to understand and choose electric vehicles as a viable option for their transportation needs as per social cognitive theory. An effective awareness campaign can alter the social environment by providing information and increasing exposure to electric vehicles, thereby encouraging purchase intentions. Finding that awareness about electric vehicles is strongly associated with purchase intentions, as indicated by the high R-squared value, further supports the importance of increasing awareness through campaigns. according to social cognitive theory, increasing awareness through campaigns can positively influence individuals' perceptions and behaviours regarding electric vehicles, leading to greater purchase intentions and reduced uncertainty about purchasing them.

Innovation Diffusion Theory helps elucidate how consumers' decisions to compare costs and purchase electric vehicles are influenced by a combination of hedonic value, social factors, and the diffusion process itself. The statistical analysis supports these insights by demonstrating the significance of these factors in shaping consumer behaviour. The diffusion process involves the spread of innovation through different stages of adoption. In the case of electric vehicles, initial adopters driven by innovation may pave the way for broader adoption among the majority. As awareness grows and social acceptance increases, more consumers become willing to consider electric vehicles as a viable option,

7.2 ***Model validation***

Pi(r square-.883) α Ba(p=<.05)+Vc(p=<.05)+Hv(p=<.05)+Si(p=<.05)

(Pi=purchase intention; Ba=brand awareness; Vc=Vehicle comparison data ;Hv=Hedonic value; Si=Social Influence)

The calculated Z-value exceeding the critical Z-value and a p-value less than the significance level (α) indicate that the relationship between hedonic value, social factors, and consumers' likelihood to compare costs and purchase electric vehicles is statistically significant.

7.3 ***Theoretical Implication***

The findings of this study underscore the critical relationships influencing Purchase Intention (Pi) in the context of electric vehicle (EV) adoption, with strong implications rooted in Innovation Diffusion Theory and Social Cognitive Theory. With an *R-squared value of .883, the model explains a substantial portion of the variance in purchase intention, highlighting the significance of factors such as Brand Awareness (Ba), Vehicle Comparison data (Vc), Hedonic Value (Hv), and Social Influence (Si).* According to Innovation Diffusion Theory, higher brand awareness correlates positively with purchase intention ($p < .05$), suggesting that consumers are more inclined to consider EVs when they recognize the brand. This reinforces the necessity for effective marketing strategies that enhance brand

visibility in a rapidly evolving market. Vehicle comparison data also holds statistical significance ($p < .05$), emphasizing its crucial role in empowering consumers to make informed decisions. As consumers increasingly seek detailed information, providing transparent and accessible comparison data can boost their confidence in purchasing EVs. Furthermore, the significant relationship between hedonic value and purchase intention ($p < .05$) highlights the emotional and experiential factors that influence consumer preferences, suggesting that marketing efforts should focus on the enjoyable aspects of EV ownership. Social Influence (Si) is another key factor with significant impact ($p < .05$), indicating that peer opinions and societal trends play a critical role in shaping consumers' likelihood of purchasing EVs. Leveraging social proof and community engagement can effectively sway potential buyers. The calculated Z-value exceeding the critical Z-value confirms the robustness of these relationships, with p-values consistently under the significance threshold ($\alpha = .05$), indicating that the interplay among hedonic value, social factors, and the propensity to compare costs significantly shapes consumer behaviour. In summary, stakeholders in the electric vehicle market should focus on enhancing brand awareness, providing detailed vehicle comparison information, emphasizing hedonic benefits, and utilizing social influence to effectively increase purchase intentions. This multifaceted approach, grounded in established theories, can lead to more effective strategies for promoting electric vehicle adoption.

CONCLUSION

Major electric vehicle brands like Tata, Mahindra Electric, M.G and Hyundai cars have effectively increased customer awareness through impactful campaigns. This underscores the pivotal role of advertising and marketing in promoting electric vehicles. There is a strong association on purchase intentions within next six months after seeing the advertisement. The study emphasizes factors influencing customer awareness, perception, buying behavior, and competition in electric vehicle market. Manufacturers should prioritize eco-friendliness, innovative technology, and range extension to attract customers. Effective advertising and marketing are essential for promoting electric vehicles. Intense competition demands innovation and customer satisfaction for manufacturers to stay competitive. To influence customer perception towards electric vehicles, manufacturers should focus on providing a fun-to-drive experience, cutting-edge technology, and quiet output. Electric vehicle manufacturers should also highlight the benefits of an eco-friendly approach to attract customers.

MANAGERIAL IMPLICATION

This study can be used to segment future target audience of EV. It can used to position the EV vehicles in market based on price, can also be used to formulate new business strategies, can be used to understand customer perception and position the EV vehicles, develop marketing campaign for the brands, develop sakes campaign, also helpful for formulating sales territories and supply chain management strategies.

SCOPE FOR FURTHER STUDY

Social factors, including social norms, peer influence, reference groups, and social identity, also affect consumer behaviour towards electric vehicle brands. Studies may investigate how social influences impact consumers' brand choices, adoption decisions, and interactions within social networks. Research may examine the extent to which consumers' environmental attitudes and values influence their preferences for EV brands and their willingness to adopt sustainable transportation options.

CONTRIBUTION

The study gives an insight on purchase intention of electric vehicle in emerging markets like India as emerging market for electric vehicle involves a complex interplay of various factors that influence individuals' decisions regarding purchase, usage, and loyalty to specific brands within the electric vehicle (EV) market. Elaborating on the contributions in this area can shed light on the understanding of consumer preferences, motivations, and challenges related to EV adoption. Secondly, contributions to understanding consumer behaviour towards selected brands of electric vehicles contribute to advancing knowledge in the field of sustainable transportation and informing strategies for promoting the adoption of electric vehicles in the market. Utilizing Innovation Diffusion Theory, the study advances knowledge on how innovative products spread within markets, providing a framework for understanding how emerging technologies, like EVs, can gain traction and achieve broader acceptance.

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