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A STUDY OF THE IMPACT OF ARTIFICIAL INTELLIGENCE ON THE PERCEPTION OF QUALITY AND PURCHASE INTENTION OF ELECTRIC VEHICLES WITH REFERENCE TO MADHYA PRADESH, INDIA

Ram Bhavesh Sharan

Research Scholar

Shri Vaishanv Institute of Management & Science, Indore

Himangi Rajwal

Student, MBA- FT, Semester IV

Shri Vaishanv Institute of Management & Science, Indore

ABSTRACT

An Electric Vehicle is defined as a vehicle that is driven by electricity, contrary to conventional Internal Combustion Engine vehicles, which are driven by petrol or diesel. The recent decades have been marked by the growth of Artificial Intelligence in many aspects of businesses. As technology advancements take place, so does the application of technology in the design and production of goods. Electric Vehicles require electricity, which is drawn from batteries. Artificial Intelligence can encompass various aspects of the industry of Electric Vehicles. The paper attempts to throw light on how customers perceive the application of Artificial Intelligence in the automotive sector, especially with respect to Electric Vehicles. It highlights various quality dimensions and how the perception of customers regarding these quality dimensions of Electric Vehicles is affected by the application of Artificial Intelligence. Also, the impact of Artificial Intelligence on the purchase behavior of customers is studied.

The quality parameters that are included in this paper are derived from the eight dimensions of quality proposed by Garvin. These eight dimensions of quality are Performance, Features, Durability, Reliability, Serviceability, Aesthetics, Conformance, and Perceived Quality. The objectives of the study were to study the impact of Artificial Intelligence on the total quality perception of customers, the impact of Artificial Intelligence on purchase intention, the difference in perception of rural and urban customers regarding the awareness of the application of Artificial Intelligence quality and compare the perception of rural and urban customers regarding the quality of Electric Vehicles.

Key Words: Artificial Intelligence (AI), Electric Vehicles (EVs), Dimensions of quality, Purchase intention.

INTRODUCTION

An Electric Vehicle is defined as a vehicle driven by electricity, contrary to conventional Internal Combustion Engine vehicles driven by petrol or diesel. So, the Electric Vehicles are powered by renewable sources of energy, which boosts the case of sustainable development. As technology advancements are taking place drastically, the sector of Electric Vehicles is also not untouched by technology advancements, such as the application of Artificial Intelligence. Artificial Intelligence is the branch of Computer Science that deals with the intelligence of machines, making jobs easier for humans. Machine Learning, Automation,

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and Robotics are a few methods of Artificial Intelligence. During the last few decades, these vehicles have been appearing on roads owing to awareness of environmental issues and rising costs of petrol and diesel, coupled with sustainability issues. On environmental issues, industry and transportation are major challenges. The transportation sector can reduce its carbon footprint if Electric Vehicles are adopted because they are driven by renewable sources of energy. The number of Electric Vehicles reached 26 million on the world's roads in 2023, a substantial increase from 12 million in 2021 (Muhammad Rauf, 2024).

As AI is getting integrated into businesses, the sector of Electric Vehicles can take great advantage of AI. For Electric Vehicles, vehicle design, battery technology, and motor efficiency are some of the factors that can be impacted with the application of AI. AI also has the potential to drastically reduce the environmental impact of vehicles. But at the same time, the awareness or perception of customers regarding the application of AI in the design and production of Electric Vehicles should be studied. It is also required to study what the customers perceive about the quality of Electric Vehicles in the presence of the application of AI in the design and production of Electric Vehicles. The customers' perception regarding the quality of Electric Vehicles may be impacted by their awareness of the application of AI in the design and production of Electric Vehicles. As sustainable development is important for humanity, the role of AI in the transportation sector is important, and so is its application.

APPLICATION OF AI IN ELECTRIC VEHICLES

AI finds application in Electric Vehicles in different ways, enabling the users of Electric Vehicles a very different experience in terms of energy management, safety, reliability, durability, maintenance cost, and connectivity.

- **Predictive Maintenance** – It analyzes data from various sensors in the vehicle to predict potential failure before the could take place. Battery performance, motor performance, and past maintenance data are also monitored, and future breakdowns could be prevented, which can significantly reduce the maintenance costs. For example, the temperature of the battery going too high or noise in the motor can be monitored, and the problem could be sorted out much earlier. This feature of AI boosts the reliability and durability of Electric Vehicles.
- **Smart and safe driving –** to prevent accidents and ensure safety, the smart driving system comes in very handy. With the help of sensors and cameras, the smart driving system can track unsafe road conditions as well as accident-prone regions. Features like an automatic emergency braking system reduce risks. The Artificial Intelligence-driven Adaptive Cruise Control System can change the speed of the vehicle to maintain a safe distance between vehicles, ensuring safety.
- **Smart charging –** Electric Vehicles require frequent charging for efficient driving. With AI in the picture, customers get information regarding when to charge and how many hours to charge. The demand for electricity for the vehicles is monitored along with the peak demand period in the neighbourhood. With Vehicle-to-Grid Technology, you can reverse some of the stored battery power back to the Grid. This is a Win-Win phenomenon for both the vehicle owners and the electricity provider.
- **Smart Range prediction –** This feature is very useful in long-distance travel. This feature predicts the remaining driving range and maximizes energy usage by adapting routes, traffic congestion, road conditions, and driving style. So the driver gets an estimate of range and energy remaining.

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- **Connectivity –** AI allows an interconnected fleet of Electric Vehicles, people, and charging infrastructure. Electric Vehicles get access to information regarding traffic congestion, climate, roadside information, and hazardous locations etc. Messages are spread among users of Electric Vehicles because of connectivity. Voice recognition and face recognition also add to the personal experience, getting better with AI.

QUALITY

The definition of quality is very customer-centric, and it also varies from situation to situation. Management gurus have propounded various definitions and dimensions. Garvin (1987) proposed eight dimensions of quality. These eight dimensions of quality are Performance, Features, Durability, Reliability, Serviceability, Aesthetics, Conformance, and Perceived Quality.

Source: https://hbr.org/1987/11/competing-on-the-eight-dimensions-of-quality

Garvin's 8 dimensions of quality

- **Performance** - in the case of Electric Vehicles, it may mean how fast the charging takes place with the help of AI, how long the fully charged Electric Vehicle runs before the next recharge, etc.
- **Features** - These are secondary characteristics that shape the performance of the product. For example, in the case of Electric Vehicles, it may mean features of the battery, features of the motor, navigation system, features of the wheels, overall safety features, etc, in the context of AI.
- **Durability** -. In the case of Electric Vehicles, it may mean how long the user of Electric Vehicles finds it working satisfactorily without replacement. It means how AI makes the life of Electric Vehicles longer.
- **Reliability** - In the case of Electric Vehicles, it may mean how it performs if the road situation is not favorable. It also means how reliable the battery or motor is, and how reliably the AI system works for connecting the Electric Vehicles with the charging infrastructure.
- **Serviceability** - In the case of Electric Vehicles, it may mean how easily the AI system allows the product access to service stations, and how fast the AI system detects the defects and faults in the product, and how easily the repair and maintenance work is completed.
- **Aesthetics** - it means the looks, colour, appearance, and external design of a product, which affects the purchase intention of customers.
- **Conformance** - it means the degree to which a product meets the desired or specified specifications and dimensions. It also means specifications in terms of the time required to deliver and the time required to serve. In the case of Electric Vehicles, it may mean the pre-specified amount of time required to fully charge, pre specified amount of distance travelled before next recharge, weight of the battery, shape, size of the battery, dimensions of the wheels, dimensions of the motor, and overall dimensions of the vehicle, etc.
- **Perceived Quality-** it is related to a product's overall public image, reputation, and brand name. In the case of an Electric Vehicle, it may mean how environmentally

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friendly the Electric Vehicle is perceived by the users, how safe, durable, and reliable the Electric Vehicle is perceived.

REVIEW OF LITERATURE

Muhammad Rauf et al. (2024) showed in their research various charging methods, charging technologies, role of AI in the development of Electric Vehicles. They discussed Vehicle to Grid technology, Autonomous Electric Vehicles, Battery research and development, and predictive maintenance. They also discussed the advantages and challenges of the adoption of Electric Vehicles. Advantages include low emissions, petroleum replacement, less noise, high efficiency, low operating cost, etc. They also opined that challenges exist in terms of the responsible disposal of electric components, increased energy consumption during the manufacturing of AI technologies.

E. Jayakiran Reddy et al. (2024) found in their research that AI integration with Electric Vehicles would play a positive role in sustainable development. AI technologies can ensure a safe, secure, environment-friendly friendly and efficient driving experience. AI technologies will improve overall vehicle performance. AI technologies coupled with Electric Vehicles provide major environmental benefits over traditional IC engines, lower greenhouse gas emissions, and improved air quality. They also highlighted challenges in the way of the integration of AI technology with Electric Vehicles. Issues such as data security and privacy concerns were raised by them. Also, the issues of interoperability were pointed out by them.

Yang Wang et al. (2024) concluded in their study that AI technology affects customer purchase intention through customer experience in social commerce, customer expectation, perceived usefulness, and perceived value.

Bhatnagar A. & Sharma M. (2024) studied the perception of customers regarding AI technology and concluded that AI has many benefits, such as proactive behaviour, strategic decision-making based on algorithms, minute detailing, generating new content, and control. But they also pointed out some ethical considerations about its usage as fear of job displacements, realignment of roles, privacy concerns, algorithmic biases, loss of control, and misuse of data.

Ning Fang & Worawan Ongkrutraksa (2023) found in their study that the perceived usefulness of AI affects the purchase intention of Electric Vehicles by customers positively. Similarly, the perceived enjoyment of AI affects the purchase intention of Electric Vehicles by customers positively. The perceived cyber risk of AI affects the purchase intention of Electric Vehicles by customers negatively. They didn't find strong evidence to establish a positive relationship between the perceived ease of use of AI and the purchase intention of Electric Vehicles by customers. It may be because of the complexity of vehicle information and the limited popularity of domestic AI technology as compared to global technology.

Kuruvilla V. & Pandiyan V. K. (2023) examined in their research different approaches of AI technology used for power quality problems. They also concluded that acceptance of electrification also depends on the availability of materials required for the development of Electric Vehicles, grid integration for charging and recharging, and the innovation gap. They also presented the significance of Vehicle to Grid integration into the power grid to overcome the barriers to widespread adoption to enhance grid integration.

Weiqi hua et al. (2023) provided a comprehensive overview of the integration of AI and Electric Vehicles. First, they discussed the challenges in the Electric Vehicles segment, like battery technology, capacity, range, lifespan, cost, and infrastructure. They also discussed

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elements of AI and the application of AI in Electric Vehicles, including range prediction, improvement of range efficiency, and optimization of battery usage. They also pointed out the lack of application of AI in the Electric Vehicles sector.

Shen Zhang (2021) provided a comprehensive review of AI methods and learning algorithms applied to electric machines, and also provided some outlook towards widespread application in industry.

Mekyung Lee (2020) demonstrated in his study the dynamic changing pattern of the convergence of AI and Electric Vehicle technology and revealed how AI has affected Electric Vehicle innovation over time. AI technology in Electric Vehicles has affected the prediction ability of battery capacity and charging time, and optimization of energy management systems.

RESEARCH GAP IDENTIFICATION

A considerable amount of research and studies have been done in the sector of Electric Vehicles. But there exists a considerable lack of research in the area of integration of AI and Electric Vehicles. Very few such studies and research have taken place in India. Also, whatever research has been done in India and abroad, most of them are secondary. Most of the research has focused on how AI can improve and boost the segment of Electric Vehicles. Primary research focusing on customers' perception regarding the integration of AI and Electric Vehicles needs to be carried out, and there is a lack of research in this area. Even the previous studies, which are secondary in nature, have focused on general characteristics of Electric Vehicles with the integration of AI. There is a lack of research focusing on the quality aspect of Electric Vehicles with the integration of AI.

OBJECTIVES OF THE STUDY

- To study the impact of awareness of the application of AI in Electric Vehicles on the total quality perception of customers.
- To study the impact of awareness of the application of AI in Electric Vehicles on the purchase intention of customers.
- To compare the users and non-users of Electric Vehicles regarding their awareness of the application of AI in Electric Vehicles.
- To compare the rural and urban customers regarding their awareness of the application of AI in Electric Vehicles.

RESEARCH METHODOLOGY

A survey method has been carried out for the research. The research is descriptive, and the Convenience Sampling Method has been applied. Questionnaires in the form of multiple-choice questions were sent to respondents in the state of Madhya Pradesh, India, through emails and social contacts. Responses were in the form of a 5-point Likert scale. Questions were related to demographic information, awareness of AI in Electric Vehicles, and the perception of respondents regarding various dimensions of quality. The dimensions of quality considered are Garvin's dimensions of quality. A total of 118 responses were received. Tools like T-Test, Regression Analysis, and Percentage Analysis were applied through SPSS and MS Excel.

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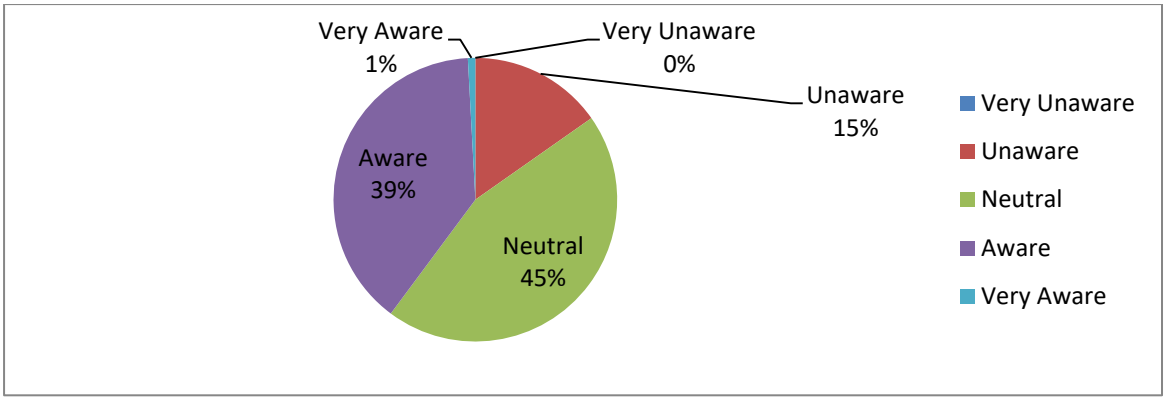
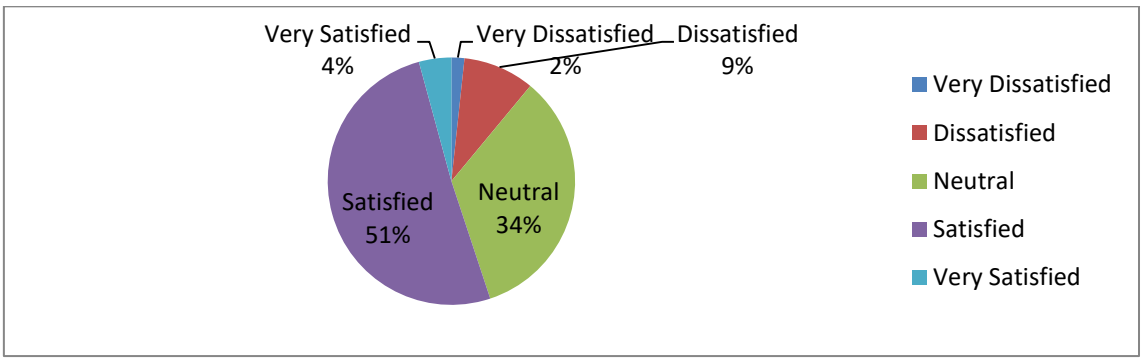
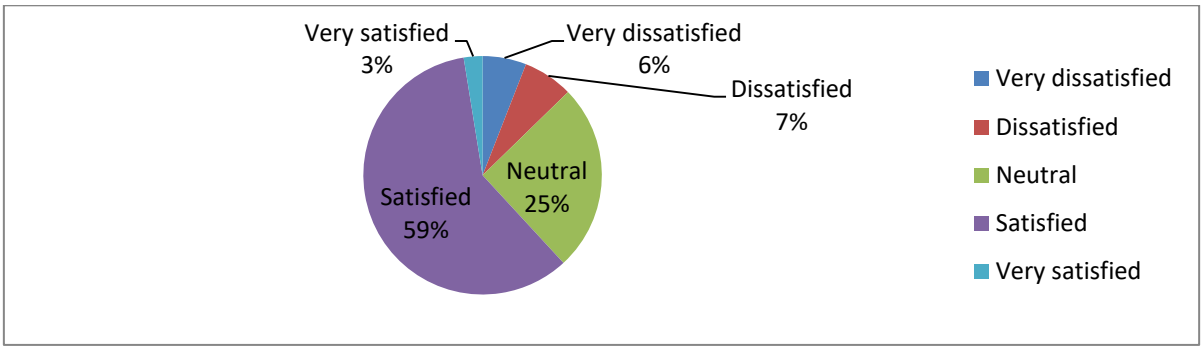
FINDINGS



It has been found that 39% of respondents are aware of the application of AI in the production and design of Electric Vehicles, and only 1% are very aware. A considerable number (45%) of respondents have given a neutral opinion. Only 15% of respondents are unaware. So, overall, it is found that respondents are aware application of AI in the production and design of Electric Vehicles.



It has been found that 51 % of respondents are satisfied with the battery performance in terms of the charging speed of batteries of Electric Vehicles, and 4 % are very satisfied. So it is observed that the majority of the respondents feel positive about the battery performance of Electric Vehicles in terms of charging speed.



It has been found that 59 % of respondents are satisfied with the battery performance in terms of distance travelled after being fully charged, and 3 % are very satisfied. So it is found that the majority of the respondents feel positive about the battery performance of Electric Vehicles in terms of distance travelled after being fully charged.

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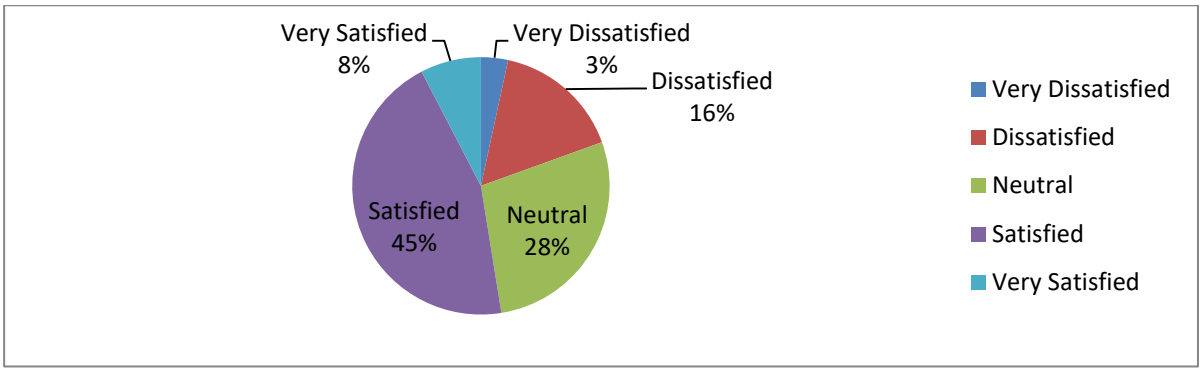
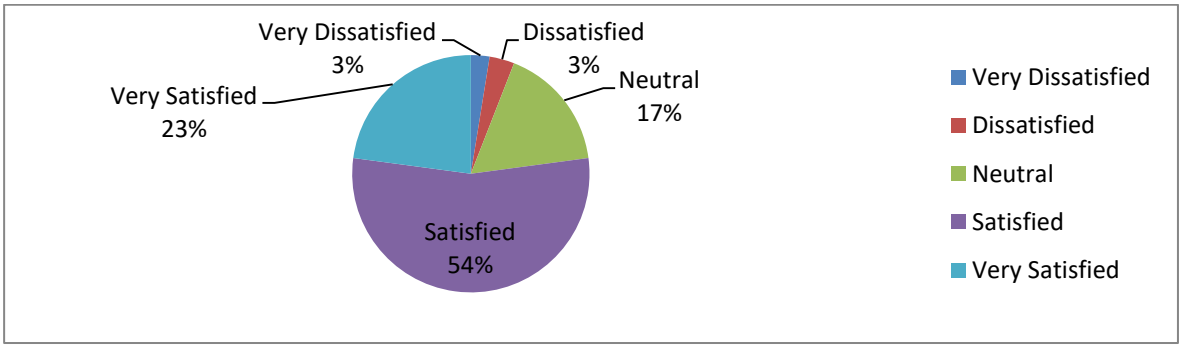
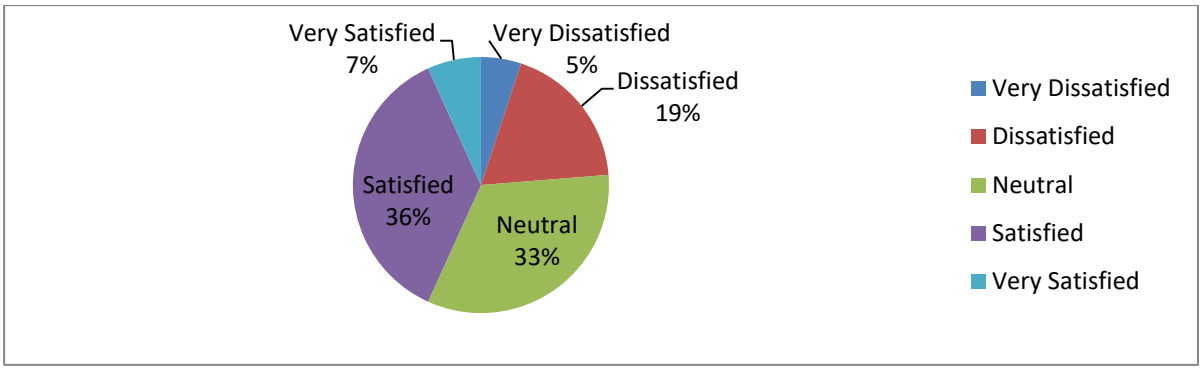


It has been found that 45 % of respondents are satisfied with the safety features of Electric Vehicles, and 8 % are very satisfied. 28 % of respondents have given a neutral opinion, so it is found that on the dimension of safety, respondents have not given very satisfactory feedback.



It has been found that 54 % of respondents are satisfied with the looks and appearance of Electric Vehicles, and 23 % are very satisfied. Only 3% are dissatisfied, and 3% are very dissatisfied. So it is observed that on the dimension of looks and appearance, respondents have given very satisfactory feedback.



It has been found that only 36 % of respondents are satisfied with the serviceability of Electric Vehicles, and only 7 % are very satisfied. It means on the dimension of serviceability, respondents don't feel very positive about the Electric Vehicles. It has received negative feedback.

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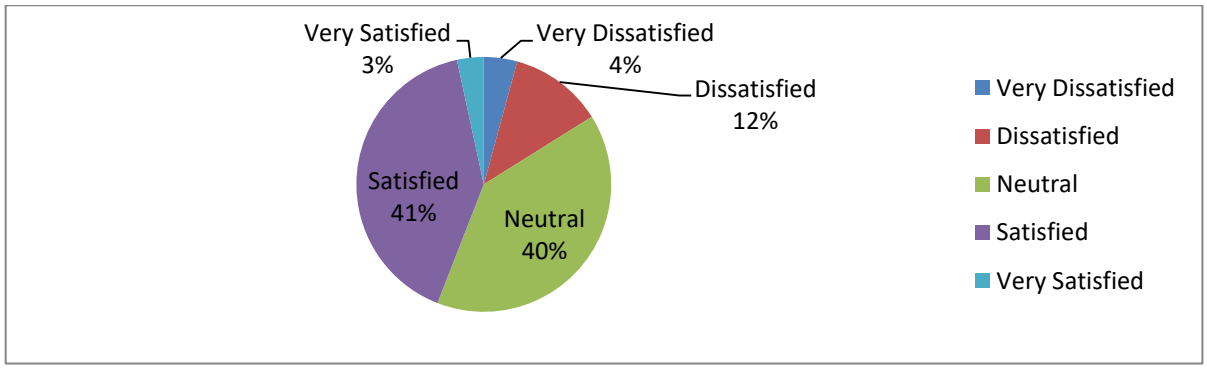
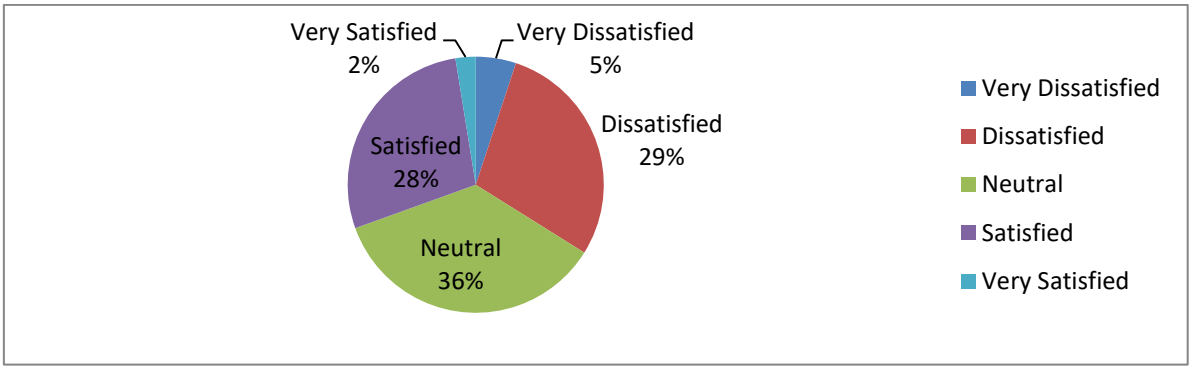
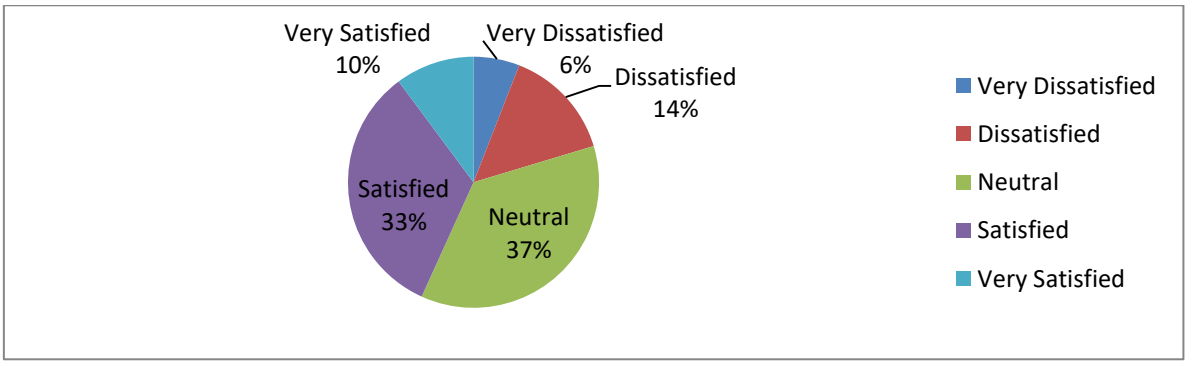


It has been found that only 41 % of respondents are satisfied with the battery life or durability of batteries of Electric Vehicles, and only 3 % are very satisfied. So it is observed that durability has also not received positive feedback.



It has been found that only 36 % of respondents are satisfied with the reliability of Electric Vehicles on roads during times of urgency, and only 2 % are very satisfied. 29 % are dissatisfied and 5% are very dissatisfied. It means that on the reliability issues of Electric Vehicles, respondents have given negative feedback.



It has been found that only 33 % of respondents are satisfied with the maintenance cost of Electric Vehicles, and only 10 % are very satisfied. It is observed that the majority of respondents have given negative feedback on the issue of maintenance costs.

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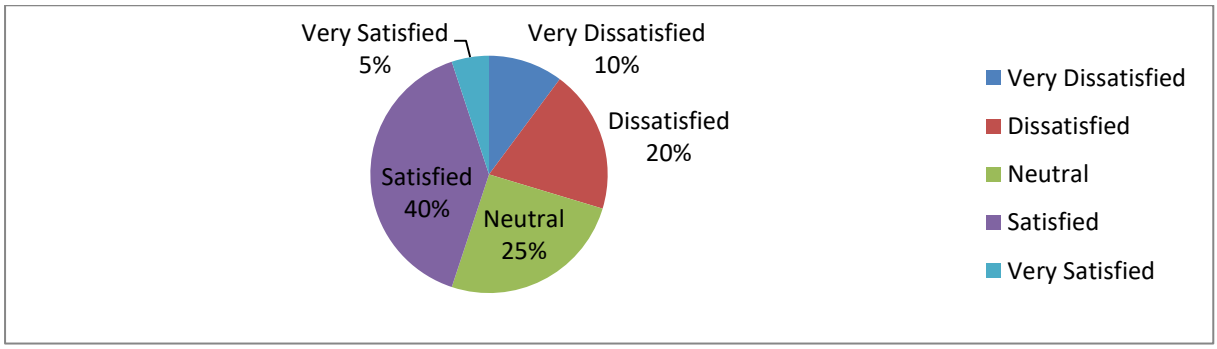
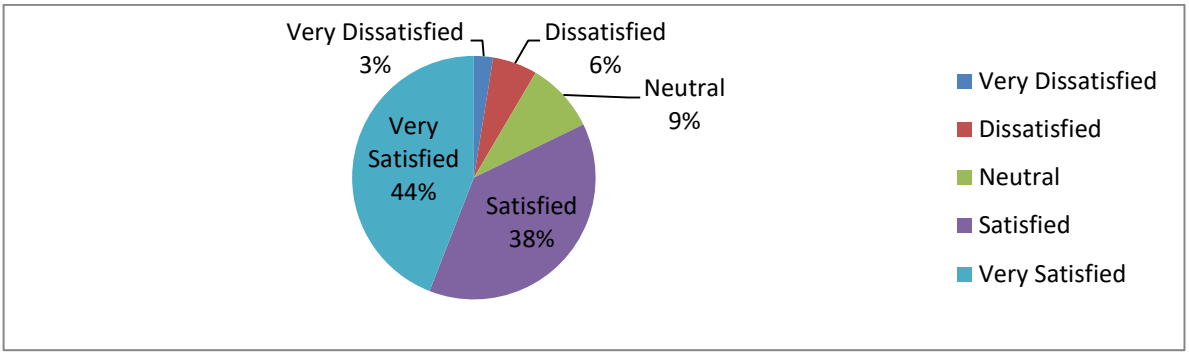
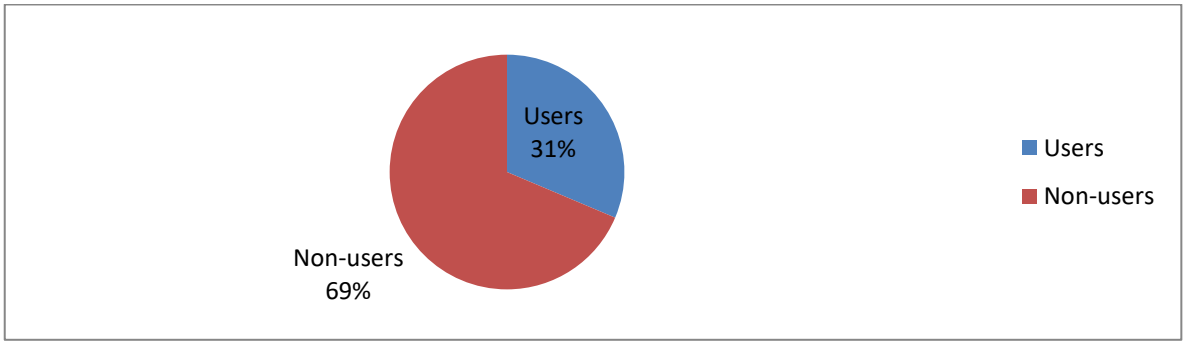


It has been found that only 40 % of respondents are satisfied with the purchase price of Electric Vehicles, and only 5 % are very satisfied. So the majority of respondents are not positive about the dimension of purchase price as well.



It has been found that 38 % of respondents are satisfied with the environmental benefits of Electric Vehicles, and 44 % are very satisfied. It means that the majority of respondents feel very positive about the dimension of perceived quality of Electric Vehicles. Respondents find Electric Vehicles a better alternative to conventional vehicles.



It is found that among the respondents 31% are users and the remaining 69% are non-users of Electric Vehicles. So it may mean Electric Vehicles have still not overpowered conventional vehicles on the roads.

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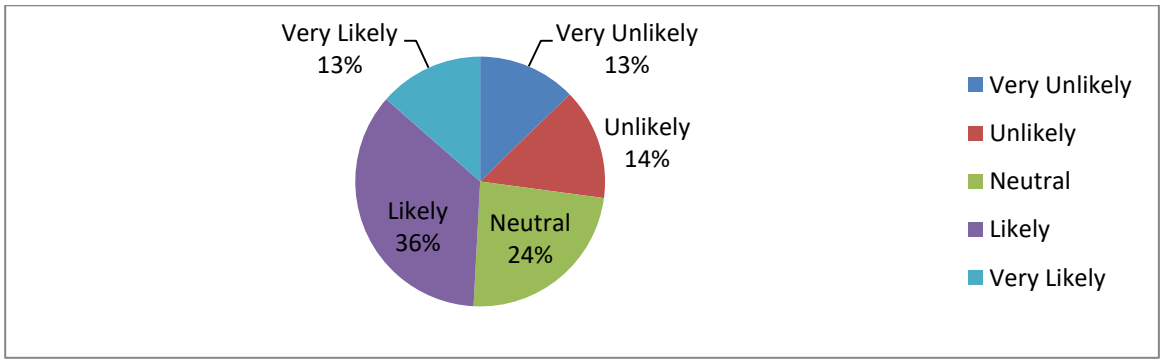

It has been found that 36 % of respondents are likely to purchase an Electric Vehicle over a conventional vehicle if willing to purchase a new vehicle, and 13 % are very likely to purchase. 14% are unlikely to purchase an Electric Vehicle over a conventional vehicle, and 13% are very unlikely to purchase an Electric Vehicle. 24% of respondents have given a neutral opinion. This is a slight positive inclination towards willingness to purchase an Electric Vehicle over a conventional vehicle.

HYPOTHESIS

$H_0$1: There is no significant impact of awareness of the application of AI in Electric Vehicles on the total quality perception of respondents.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.267[a]	0.071	0.063	0.50911

a. Predictors: (Constant), Awareness of application of AI

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.313	1	2.313	8.924	.003[b]
	Residual	30.066	116	0.259		
	Total	32.379	117			

a. Dependent Variable: Total quality perception

b. Predictors: (Constant), Awareness of application of AI

Coefficients[a]

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Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	2.779	0.218		12.730	0.000
	Awareness of application of AI	0.196	0.066	0.267	2.987	0.003

a. Dependent Variable: Total quality perception

Interpretation:

To test the significant impact of awareness of the application of AI in Electric Vehicles on the total quality perception of respondents, Regression Analysis was applied. Since the value of P = 0.003 < 0.05, we reject the Null hypothesis. It means the hypothesis that there is no significant impact of awareness of the application of AI in Electric Vehicles on the total quality perception of respondents is rejected. We conclude that awareness of the application of AI in Electric Vehicles and the total quality perception of respondents are related. The value of R is positive, which indicates they are positively related. The value of R square is 0.071, which means that though they are positively related, the impact of awareness of the application of AI in Electric Vehicles on the total quality perception of respondents is very mild.

The relation between the two is represented by the equation:

Total quality perception of respondents = awareness of the application of AI in Electric Vehicles (0.196) + 0.267

$H_0$2: There is no significant impact of awareness of the application of AI in Electric Vehicles on the purchase intention of respondents.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.224[a]	0.050	0.042	1.20329

a. Predictors: (Constant), Awareness of application of AI

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.866	1	8.866	6.123	.015[b]

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	Residual	167.956	116	1.448		
	Total	176.822	117			

a. Dependent Variable: Purchase intention

b. Predictors: (Constant), Awareness of application of AI

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.982	0.516		3.841	0.000
	Awareness of application of AI	0.383	0.155	0.224	2.475	0.015

a. Dependent Variable: Purchase intention

Interpretation:

To test the significant impact of awareness of the application of AI in Electric Vehicles on the purchase intention of respondents, Regression Analysis was applied. Since the value of P = 0.0015 < 0.05, we reject the Null hypothesis. It means the hypothesis that there is no significant impact of awareness of the application of AI in Electric Vehicles on the purchase intention of respondents is rejected. We conclude that awareness of the application of AI in Electric Vehicles and the purchase intention of respondents are related. The value of R is positive, which indicates they are positively related. The value of R square is 0.050, which means that though they are positively related, the impact of awareness of the application of AI in Electric Vehicles on the purchase intention of respondents is very mild.

The relation between the two is represented by the equation:

Purchase intention of respondents = awareness of the application of AI in Electric Vehicles (0.383) + 0.224.

$H_0$3: There is no significant difference in the awareness of users and non-users of electric vehicles regarding the application of AI in Electric Vehicles.

t-Test: Two-Sample Assuming Unequal Variances

	users	*non users*
Mean	3.297297	3.234568
Variance	0.603604	0.48179

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Observations	37	81
Hypothesized Mean Difference	0	
df	63	
t Stat	0.420429	
P(T<=t) one-tail	0.337801	
t Critical one-tail	1.669402	
P(T<=t) two-tail	0.675603	
t Critical two-tail	1.998341	

Interpretation –

To test the difference in the awareness of users and non-users of electric vehicles regarding the application of AI in Electric Vehicles, a T-test has been applied. As the P value 0.675603 > 0.05, we fail to reject the Null hypothesis. It is concluded that both the users and non-users of Electric Vehicles have similar awareness regarding the application of AI in Electric Vehicles.

$H_0$4: There is no significant difference in the awareness of rural and urban respondents regarding the application of AI in Electric Vehicles.

t-Test: Two-Sample Assuming Unequal Variances

	Rural	*Urban*
Mean	3.055556	3.29
Variance	0.643791	0.490808
Observations	18	100
Hypothesized Mean Difference	0	
df	22	
t Stat	-1.16247	
P(T<=t) one-tail	0.128751	
t Critical one-tail	1.717144	
P(T<=t) two-tail	0.257502	
t Critical two-tail	2.073873	

Interpretation –

To test the difference in awareness of rural and urban respondents regarding the application of AI in Electric Vehicles, a T-test has been applied. As the P value is 0.257502 > 0.05, we fail to reject the null hypothesis. It is concluded that both the rural and urban respondents have similar awareness regarding the application of AI in Electric Vehicles.

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Summary of hypothesis:

	Null Hypothesis	**Result**
$H_0$1	There is no significant impact of awareness of the application of AI in Electric Vehicles on the total quality perception of respondents.	Rejected
$H_0$2	There is no significant impact of awareness of the application of AI in Electric Vehicles on the purchase intention of respondents.	Rejected
$H_0$3	There is no significant difference in the awareness of users and non-users of electric vehicles regarding the application of AI in Electric Vehicles.	Accepted
$H_0$4	There is no significant difference in the awareness of rural and urban respondents regarding the application of AI in Electric Vehicles.	Accepted

CONCLUSION AND DISCUSSION:

It has been found from the study that respondents are aware application of AI in the production and design of Electric Vehicles. The study also shows that respondents' awareness of the application of AI in Electric Vehicles and the total quality perception of customers regarding Electric Vehicles are positively related, but the impact of total quality perception on purchase intention is mild. Also, respondents' awareness of the application of AI in Electric Vehicles and the purchase intention are positively related, but the impact of total quality perception on purchase intention is mild. Also, the customers' perception regarding various dimensions of the quality of Electric Vehicles was studied.

The respondents are satisfied with the battery performance in terms of the charging speed of batteries and the distance travelled after being fully charged. Respondents have given very positive feedback on the looks and appearance, perceived quality in terms of the Environmental Concerns of Electric Vehicles. In terms of safety, the respondents have given mild, satisfactory feedback. Serviceability of Electric Vehicles, durability or battery life, and reliability of Electric Vehicles at times of urgency have not received positive feedback from the respondents. The respondents also feel that the maintenance cost and purchase price of Electric Vehicles don't offer much value for the price.

The study also reveals that users and non-users perceive the quality of Electric Vehicles similarly. There is no significant difference between their perception. The study also concludes that rural and urban respondents have similar awareness of the application of AI in Electric Vehicles. A small percentage of respondents have shown willingness in purchasing Electric Vehicles over conventional vehicles, which is not in agreement with **Varghese A.T. et. al. (2021),** according to whom the majority of customers were willing to purchase Electric Vehicles over conventional vehicles despite the hurdles of driving range, price range, and charging infrastructure. But his study was not in the purview of AI.

LIMITATIONS OF THE STUDY

The sampling method used was the convenience sampling method. A total of 118 responses were received. The respondents are aware of the application of AI in Electric Vehicles, but they may not be completely aware of what AI is. They may not know the wide application of AI. They were not asked what they meant by application of AI in Electric Vehicles.

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Out of these 118 respondents, only 37 (31.35%) have used or owned Electric Vehicles. So, biases cannot be ignored. It was also not incorporated in the study how long the users or owners of Electric Vehicles have been using Electric Vehicles. Out of 118 responses, only 18 (15.2%) are from rural regions. The rest are from urban regions. The rural regions did not get sufficient representation in the sample.

IMPLICATIONS OF THE STUDY

The study points out the dimensions of quality on which the Electric Vehicles have not received better feedback. Reliability, Durability, Safety, Serviceability, maintenance cost, and purchase price are those dimensions of quality that have not received positive feedback. These factors are important dimensions of quality. So the steps and actions would be taken to sort out these issues.. The looks and appearance of Electric Vehicles, battery performance in terms of the charging speed of batteries, and also in terms of distance travelled after fully charged, the Environmental Concerns have received better feedback from the respondents. So these factors may continue to contribute to the better adoption of Electric Vehicles in the future.

It has been found in the study that a small percentage of respondents have shown a willingness to purchase Electric Vehicles over conventional vehicles. As per the study, the awareness of the application of AI in Electric Vehicles affects the total quality perception as well as purchase intention positively. So, the application of AI should be followed, and customers must be educated regarding the aspects of AI that can play a positive role in the quality of Electric Vehicles. As the customers' awareness of the application of AI in Electric Vehicles increases, the perception of quality and purchase intention may also improve.

SCOPE FOR FUTURE STUDY

We have studied the impact of awareness of AI in Electric Vehicles on total quality perception and purchase intention. Future research should incorporate the features of AI in seeking the responses of respondents. For example, features of Predictive maintenance, smart driving, smart charging, etc, should be studied directly to find out their impact on the purchase intention of respondents. Also, separate research is possible to find out the perception and feedback of users of Electric Vehicles regarding the experience of AI in Electric Vehicles. Manufacturers and the entire value chain also get impacted by technology. So, research should also be done to study the impact of AI on manufacturers and distributors of Electric Vehicles as well as on the the suppliers of parts and components of Electric Vehicles.

REFERENCES

1. Bhatnagar A. & Sharma M. (2024). Artificial Intelligence and Consumer's Perception : A Research on Environmentally Conscious Consumer. *Journal of Metaverse*. *4*(2), 105-115. Doi: 10.57019/jmv.1488022
2. Fang, N., & Ongkrutraksa, W. (2023). Exploring the influence of AI on purchase intention of electric vehicle among consumers in China. In Li, E.Y. *et al.* (Eds.) *Proceedings of The International Conference on Electronic Business, Volume 23* (pp. 263-270). ICEB'23, Chiayi, Taiwan, October 19-23, 2023.
3. Hua, Weiqi & Mullen, Daniel & Wahid, Abdul & Sitabkhan, Khadija & Mason, Karl. (2024). An Overview of Artificial Intelligence for Electric Vehicle Energy Systems Integration. 10.13140/RG.2.2.16071.06564

© Copyright @ Authors

ISSN: 2350-1278
Peer Reviewed & Refereed Journal (IF: 7.9)
Journal Website www.nrjitis.in

4. Lee, Mekyung. (2020). An analysis of the effects of artificial intelligence on electric vehicle technology innovation using patent data. World Patent Information. 63. 102002. 10.1016/j.wpi.2020.102002.
5. Rauf, Muhammad & Kumar, Laveet & Zulkifli, Saiful & Jamil, Atif. (2024). Aspects of Artificial Intelligence in Future Electric Vehicle Technology for Sustainable Environmental Impact. Environmental Challenges. 14. 100854. 10.1016/j.envc.2024.100854.
6. REDDY, K & Pratyusha, D & Sravanthi, B & Esanakula, Jayakiran. (2024). Recent AI Applications in Electrical Vehicles for Sustainability. International Journal of Mechanical Engineering. 11. 50-64. 10.14445/23488360/IJME-V11I3P106.
7. Yang, C., et al., (2024). The Impact of Artificial Intelligence Technology on Customer Purchase Intention in Social Commerce within Electrical Systems Applications. Journal of Electrical Systems. 20-12s (2024):292-304.
8. Vidhya Kuruvilla & Pandiyan Venkatesh Kumar (2023). International Journal of Power Electronics and Drive Systems. Vol. 14, No. 4, December 2023, pp. 2487-2494.
9. Zhang, Shen. (2021). Artificial Intelligence in Electric Machine Drives: Advances and Trends. 10.36227/techrxiv.16782748.v1.
10. Varghese A.T. et. al. (2021). A study on Consumer Perception and Purchase Intention of Electric Vehicles in India. Asian Journal of Economics, Finance and Management. Article no. AJEFM. 434.
11. https://hbr.org/1987/11/competing-on-the-eight-dimensions-of-quality.
12. https://www.dataforce.ai/blog/how-can-ai-and-data-annotation-accelerate-evolution-electric-vehicles.

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