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# ASSESSING THE IMPACT OF ARTIFICIAL INTELLIGENCE-BASED FEATURES ON CONSUMER DECISION-MAKING FOR ELECTRIC TWO-WHEELERS

[1]Ms. N. Sarvamangalaa, and [2]Dr. T. Poongodi

[1]PhD Scholar (Part-Time), PG & Research Department of Commerce,

[2]Research Supervisor, Salem Sowdeswari College, Salem – 10

[1]PG and Research Department of Commerce,

[1]Salem Sowdeswari College, Salem - 10, India

*Abstract:* This study examines the factors influencing consumer adoption of electric two-wheelers, focusing on the role of AI technologies, socio-economic characteristics, and other key decision-making elements. As environmental concerns and rising fuel prices drive the demand for sustainable transportation, electric two-wheelers have emerged as a viable alternative. The integration of AI features such as voice controls, AI-powered navigation, and rider assistance systems is becoming crucial in shaping consumer preferences. The study aims to explore the socio-economic characteristics of respondents and how AI technologies influence their purchase intentions. By understanding the psychological, technological, and economic factors that impact customer decisions, this research offers valuable insights for manufacturers and marketers to refine their strategies, enhance product offerings, and improve user experiences. Ultimately, the study suggests that aligning technological innovations with consumer priorities could accelerate the adoption of electric two-wheelers, contributing to both environmental sustainability and market growth.

***Index Terms*** **-** AI technology, consumer adoption, purchase intentions, socio-economic factors, sustainable transportation, marketing strategies

## I. INTRODUCTION

The growing trend toward sustainable transportation has significantly increased the demand for electric two-wheelers, driven by concerns over environmental impact, rising fuel costs, and government support for green energy solutions. As more consumers look for alternatives to traditional gasoline-powered vehicles, electric two-wheelers have emerged as an attractive option. However, purchase decisions are influenced by various factors such as price, technological advancements, performance, government incentives, and infrastructure availability. Among these, the integration of AI technology plays an increasingly important role in shaping consumer perceptions. Features like AI-powered navigation, voice controls, and rider assistance systems are becoming key drivers of adoption. AI-based driver assistance also reduces minor accidents (Muhammad Rauf et al., 2024). Understanding these factors is crucial for manufacturers and marketers to refine their strategies and improve user experience. This study examines the impact of AI technologies on consumer adoption of electric two-wheelers, offering insights to enhance marketing efforts and foster industry growth.

### 1.1 STATEMENT OF THE PROBLEM:

Despite the rapid advancements in AI technology, a gap remains in understanding its impact and influence on consumer adoption of AI-integrated electric two-wheelers. Identifying the key technological, psychological, and economic factors shaping customer perceptions will enable manufacturers and marketers to develop targeted strategies that enhance user experience and drive market growth. This study explores the role of AI in electric two-wheelers, providing insights to optimize marketing approaches and improve AI-driven innovations in the industry.

## II. LITERATURE REVIEW:

Pratyug and Krishna Kishore S. V. (2024) performed research entitled "A Study on the Factors Influencing Adoption of Electric Two-Wheelers in Tier-1 Cities." The study sought to investigate the correlation among gender, pay level, and the adoption rate of electric two-wheelers. Results demonstrated that gender does not affect adoption, although pay level significantly influences it. The report advocated for the execution of focused marketing initiatives, the expansion of charging infrastructure, and the elevation of environmental consciousness to improve adoption rates.

Dr. Mohd Waheeduddin and colleagues (2024) did a study entitled "A Study on Consumer Perception Towards Two-Wheeler Electric Vehicles in Hyderabad." The study sought to evaluate customer perception and examine the efficacy of electric two-wheelers in Hyderabad. The findings underscored that minimizing fuel consumption and carbon emissions is a paramount worldwide goal for governments, accentuating the necessity for efficient and environmentally sustainable electric two-wheelers. The report advised manufacturers to augment fuel efficiency, remodel vehicle aesthetics and capacity, and boost speed and battery longevity to satisfy consumer demands.

Syed Waqas Javed and Dr. Hafiz Muhammad Khurram, (2022), In their study, investigated consumer inclinations towards the adoption of electric two-wheelers, highlighting the necessity to improve awareness, especially among students and prospective customers. The research emphasized the need of robust distribution networks and competitive pricing to enhance sales. It found eleven principal elements affecting customer decisions, with awareness, design, visual appeal, and health and safety being the most significant. These findings offer critical information for stakeholders to prioritize to expedite the general adoption of electric two-wheelers.

M. Ukesh and M. Chandrakumar (2022) performed research entitled "A Study on Brand Awareness of Electric Two-Wheelers in Coimbatore City." The study investigated consumer knowledge about the choice of electric two-wheeler brands in Coimbatore, Tamil Nadu, utilizing a sample of 120 respondents from several city zones. The results indicated that customers perceive electric two-wheelers as an environmentally sustainable option, particularly advantageous for urban settings, especially in light of increasing fuel expenses. Moreover, electric cars were regarded as more economical than traditional fuel-powered automobiles.

## III. OBJECTIVES:

- ❖ Examine the socio-economic characteristics of the respondents.
- ❖ Investigate whether AI technology features impact the purchase intention towards electric two-wheelers.

### 3.1 Hypothesis

1. No significant difference exists between respondents' gender and the factors influencing their purchase intention of electric two-wheelers.

## IV. RESEARCH METHODOLOGY:

This study utilizes convenience sampling, a non-probability sampling method. This approach involves gathering data from readily available and willing participants, ensuring a more efficient and time-effective data collection process. Data is collected from a sample of 186 respondents who are potential customers of electric two-wheelers. The study primarily relies on primary data collected through surveys and questionnaires administered to the sample of respondents. This firsthand information will provide insights into consumer preferences and purchase intentions regarding electric two-wheelers. Information has been collected from a sample of 186 respondents residing in Salem city.

## V. FINDINGS/RESULTS:

Table 1: Classification of respondents based on their age, gender, and family income

| Type of Data | Frequency (n=186) | Percentage |
|---|---|---|
| **Age** | | |
| 18-25 | 119 | 63.98 |
| 26 – 35 | 47 | 25.27 |
| 36 – 45 | 11 | 5.91 |
| 46 – 60 | 9 | 4.84 |
| **Gender** | | |
| Male | 89 | 47.85 |
| Female | 97 | 52.15 |
| **Family Monthly Income** | | |
| Upto Rs. 25,000 | 8 | 4.30 |
| Rs. 25,001 – Rs. 40,000 | 32 | 17.20 |
| Rs. 40,001 – Rs. 55,000 | 113 | 60.75 |
| Above 55,000 | 33 | 17.74 |

***Source: Primary Data Inference***

Table 1 indicates that 63.98% of the participants are in the 18-25 age range, 25.27% are in the 26-35 age range, 5.91% fall within the 36-45 age range, and 4.84% are in the 46-60 age range. Furthermore, the data reveals that 47.85% of the participants identify as male, whereas 52.15% identify as female, highlighting a slight gender disparity. Regarding income levels, 4.30% of the participants have their monthly income up to Rs. 25,000, 17.20% earn between Rs. 25,001 – Rs. 40,000, 60.75% earn between Rs. 40,001 – Rs. 55,000, and 17.74% earn above Rs. 55,000.

Overall, the majority of respondents are aged 18-25 years, most are female, and most have a family monthly income of Rs. 40,001 – Rs. 55,000.

Table 2: Distribution of the Respondents According to the Brand of Electric Two-Wheelers

| S.No. | Key Factors | Frequency | Percentage |
|---|---|---|---|
| 1 | Ola | 59 | 31.72 |
| 2 | Ather | 44 | 23.66 |
| 3 | Mahindra Electric | 9 | 4.84 |
| 4 | Ampere | 17 | 9.14 |
| 5 | TVS | 35 | 18.82 |
| 6 | Hero Electric | 16 | 8.60 |
| 7 | Bajaj Chetak | 6 | 31.72 |
| **TOTAL** | | **186** | **100** |

***Source: Primary Data Inference***

Table 2 shows that 31.72 percent of the participants prefer the Ola brand of electric two-wheelers, followed by 23.66 percent who prefer Ather. TVS is chosen by 18.82 percent of the respondents, while 8.60 percent prefer Hero Electric. Ampere is selected by 9.14 percent of the respondents, whereas Mahindra Electric is preferred by 4.84 percent. Meanwhile, Bajaj Chetak is also preferred by 31.72 percent of the participants.

Table 3: Classification of the Participants According to the Factors Influencing Purchase Intention

| S.No | Key Factors | Frequency | Percentage |
|---|---|---|---|
| 1 | Smart Battery Management System (BMS) | 25 | 13.02 |
| 2 | Predictive Maintenance | 17 | 8.85 |
| 3 | AI based Navigation | 45 | 23.44 |
| 4 | Voice and Gesture Controls | 32 | 16.67 |
| 5 | Rider Assistance Systems | 49 | 25.52 |
| 6 | AI Powered Charge Optimization | 18 | 9.68 |
| **TOTAL** | | **186** | **100** |

***Source: Primary Data Inference***

Table 3 shows that 25.52% of participants consider Rider Assistance Systems as the most important factor in their purchase decision. AI-based Navigation follows with 23.44%, while 16.67% prefer Voice and Gesture Controls. Smart Battery Management System (BMS) is important to 13.02% of respondents, 9.68% prioritize AI-Powered Charge Optimization, and 8.85% value Predictive Maintenance.

Table 4: Distribution of the Respondents According to Their Willingness to Spend on Electric Two-Wheelers

| S.No | Key Factors | Frequency | Percentage |
|---|---|---|---|
| 1 | Upto Rs.50,000 | 63 | 32.81 |
| 2 | Rs.50,000 to Rs.1,00,000 | 83 | 43.23 |
| 3 | Rs.1,00,001 to Rs.1,50,000 | 54 | 29.03 |
| 4 | Rs.1,50,001 to Rs.2,00,000 | 6 | 3.13 |
| **TOTAL** | | **186** | **100.0** |

***Source: Primary Data Inference***

Table 4 indicates that 43.23% of the participants are inclined to invest between Rs.50,000 and Rs.1,00,000 on electric two-wheelers. About 32.81% are willing to spend up to Rs.50,000, while 29.03% are ready to spend between Rs.1,00,001 to Rs.1,50,000. Only 3.13% are willing to spend between Rs.1,50,001 to Rs.2,00,000.

Table 5: 'Z' Test Analysis of Respondent Age and Factors Affecting Electric Two-Wheeler Purchase Intention

| S.No | Gender | Sample Size (n=192) | Mean | S.D. | Statistical Inference |
|---|---|---|---|---|---|
| 1 | Smart Battery Management System (BMS) | 25 | | | |
| | Male | 89 | 3.48 | 1.313 | Z = 0.776<br>0.429<br>Greater than 0.05<br>Not significant |
| | Female | 97 | 3.36 | 1.263 | |
| 2 | Predictive Maintenance | 17 | | | |
| | Male | 89 | 3.09 | 1.421 | Z =1.078<br>0.268<br>Greater than 0.05<br>Not Significant |
| | Female | 97 | 3.28 | 1.169 | |
| 3 | AI based Navigation | 45 | | | |
| | Male | 89 | 3.30 | 1.398 | Z =0.795<br>0.418<br>Greater than 0.05<br>Not Significant |
| | Female | 97 | 3.19 | 1.206 | |
| 4 | Voice and Gesture Controls | 32 | | | |
| | Male | 89 | 3.49 | 1.245 | Z = 2.277<br>0.021<br>Less than 0.05<br>Significant |
| | Female | 97 | 3.19 | 1.364 | |
| 5 | Rider Assistance Systems | 49 | | | |
| | Male | 89 | 3.49 | 1.274 | Z = 3.089<br>0.002<br>Less than 0.05<br>Highly Significant |
| | Female | 97 | 3.03 | 1.332 | |

| | | | | | |
|---|---|---|---|---|---|
| 6 | AI Powered Charge Optimization | 18 | | | |
| | Male | 89 | 3.41 | 1.287 | Z =0.786<br>0.419<br>Greater than 0.05<br>Not Significant |
| | Female | 97 | 3.27 | 1.332 | |

**Hypothesis:**

H0 = There is no significant difference between respondents' gender and the factors influencing their propensity to acquire electric two-wheelers.

Ha = There is a substantial difference between the respondents' gender and the variables influencing their propensity to acquire electric two-wheelers.

**Inference**: As shown in Table 5, there is no substantial difference between genders in terms of Smart Battery Management System (BMS), Predictive Maintenance, AI-based Navigation and AI-Powered Charge Optimization. Thus, the null hypothesis is accepted.

There is a substantial variation between genders in terms of Voice and Gesture Controls and Rider Assistance Systems. Therefore, the null hypothesis is rejected.

## VI. SUGGESTIONS:

- The companies must provide more accurate navigation
- Voice and Gesture controls must be enhanced
- Connectivity between Smartphones and E-Two-wheelers must be optimized

## VII. CONCLUSION:

This study explores factors influencing electric two-wheeler purchase intentions, focusing on age, gender, income, brand preferences, and AI features. Most respondents are aged 18-25, with an equal gender split and earnings between Rs. 40,001 – Rs. 55,000. Ola and Ather are the top brands. Key features influencing decisions include Rider Assistance Systems, AI-based Navigation, and Voice and Gesture Controls. While gender shows no significant impact on most factors, it influences preferences for certain features like Rider Assistance Systems. The findings suggest manufacturers should improve AI features and target younger, mid-income consumers to boost adoption.

## VIII. LIMITATIONS:

- The research area is restricted to Salem city only.
- Due to time and economic constraints of the research, number of respondents has been limited to 186 only.
- The opinion of the respondents may vary with time, so the results may not hold good at all times

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