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Factors Influencing Intention to Purchase Electric Motorcycles in Urban India

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Abstract

This study investigates factors influencing urban Indian consumers' electric motorcycle purchase intentions amid growing sustainable transportation demands. Building on the Technology Acceptance Model (TAM), the research integrates core constructs—Perceived Usefulness, Perceived Ease of Use, and Attitude—with two contextual variables, including Consumer Awareness and Perceived Trust. A quantitative survey was distributed via Google Forms to 153 urban residents across Indian cities, with a GPower analysis confirming adequate statistical power for regression modeling. The findings reveal that Perceived Usefulness, Attitude, and Perceived Trust significantly influence consumers' purchase intentions, with attitude emerging as the most influential predictor. In contrast, Perceived Ease of Use and Consumer Awareness were not found to have a significant impact. These results suggest that government initiatives like the FAME II subsidy scheme may enhance consumers' trust and awareness, thereby supporting purchase intentions. These insights also highlight the need for policymakers to reinforce incentive structures and for manufacturers to focus on enhancing product credibility. Marketers should adopt benefit-driven communication strategies to transform consumer awareness effectively into actionable purchase intentions. Together, these efforts can help transform consumer awareness into concrete behavioral intentions, accelerating India's transition toward sustainable mobility.

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1.0 Introduction

India's rapid industrialization and urbanization have propelled its cities into economic powerhouses but have simultaneously created pressing environmental challenges. Major urban hubs like Delhi, Mumbai, and Bengaluru now face hazardous air quality, with the 2023 IQAirWorld Air Quality Report ranking Delhi as the world's most polluted capital city, while Mumbai and Bengaluru recorded $PM_{2.5}$ levels 10–12 times higher than the World Health Organization's (WHO) safe limit of 5 μg/m³ (IQAir, 2023). The Air Quality Index (AQI) in these regions regularly exceeds 300 and is classified as "hazardous," which has contributed to approximately 1.67 million premature deaths annually linked to air pollution (Pandey et al., 2021). Prolonged exposure to particulate matter, such as $PM_{2.5}$, has been directly associated with reduced life expectancy, cardiovascular diseases, and respiratory ailments (Guttikunda & Goel, 2013). Conventional internal combustion engine (ICE) vehicles are among the principal contributors to this air quality crisis, accounting for 20–30% of urban $PM_{2.5}$ emissions (The Energy and Resources Institute [TERI], 2022). In response, the Indian government has prioritized electric vehicles (EVs), positioning electric motorcycles as a sustainable alternative due to their 50–70% lower lifecycle greenhouse gas emissions and lower operational costs compared to their ICE counterparts (Niti Aayog, 2021). A key initiative, the Faster Adoption and Manufacturing of EVs (FAME II) scheme, launched in 2019, provides subsidies ranging from ₹10,000 to ₹1.5 lakh per vehicle and allocates ₹10,000 crore to charging infrastructure (Ministry of Road Transport and Highways [MoRTH], 2020).

Despite these advantages, consumer purchase intention toward electric motorcycles remains tepid. As of 2023, electric motorcycles accounted for only 4% of India's two-wheeler market, far below the FAME II scheme's target of 30% EV penetration by 2030 (Statista, 2023). This discrepancy highlights a critical paradox: severe health risks and policy incentives have not sufficiently motivated urban consumers to purchase electric motorcycles. Key barriers include range anxiety—60% of consumers cite insufficient charging infrastructure—high upfront costs incurring a 40% premium over ICE vehicles, and mistrust in battery longevity (ICCT, 2022; Jain et al., 2021). These challenges are particularly significant in India, where two-wheelers

constitute 75% of vehicular traffic (Society of Indian Automobile Manufacturers [SIAM], 2023), yet research specific on this dominant market segment remains limited.

Addressing this gap, this study extends the Technology Acceptance Model (TAM) by incorporating Consumer Awareness (CA) and Perceived Trust (PT) to examine factors influencing urban Indian consumers' purchase intention toward electric motorcycles. While the Unified Theory of Acceptance and Use of Technology (UTAUT) is widely applied, TAM's focus on perceived usefulness (PU) and perceived ease of use (PEOU) aligns better with evaluating behavioral intentions in nascent markets like electric motorcycles (Davis, 1989; Venkatesh et al., 2003). By incorporating CA and PT, the study addresses socio-psychological gaps in EV purchase intention, particularly in India's trust-deficient market (Khurana et al., 2020). By uncovering these insights, this study provides policymakers, marketers, and industry leaders with actionable strategies to bridge consumer hesitation and advance sustainable transportation aligned with urgent environmental needs.

2.0 Literature Review and Hypotheses Development

2.1 Evolution of Technology Acceptance Model (TAM)

Introduced by Davis (1989), the TAM has become a foundational framework for explaining users' behavioral intentions toward new technologies. TAM posits that two core constructs—PU and PEOU—primarily determine purchase intention. As illustrated in Figure 1, the original framework conceptualizes external variables (e.g., awareness, trust) as antecedents influencing PU and PEOU, which collectively shape users' attitudes (ATT) toward technology. These attitudes subsequently drive influence their Behavioral Intention (INT) to adopt it.

Despite its widespread application, TAM has attracted scholarly debate regarding its theoretical and methodological limitations. While its simplicity is often praised, critics argue that the model inadequately captures the dynamic interplay of contextual, cultural, and temporal factors shaping consumer purchase behaviors (Bagozzi, 2007). Empirical studies further highlight constrained explanatory power; meta-analyses indicate that

TAM explains approximately 40% of the variance in usage intentions, leaving significant gaps in understanding other influencing factors (Venkatesh & Davis, 2000). Methodological concerns persist, particularly the reliance on self-reported usage data, which frequently misaligns with objective behavioral metrics (Lee, Kozar, & Larsen, 2003). Additionally, questions remain regarding TAM's universal applicability, as its core constructs may require contextual adaptation to maintain relevance across technologies or cultural settings (Straub et al., 1997).

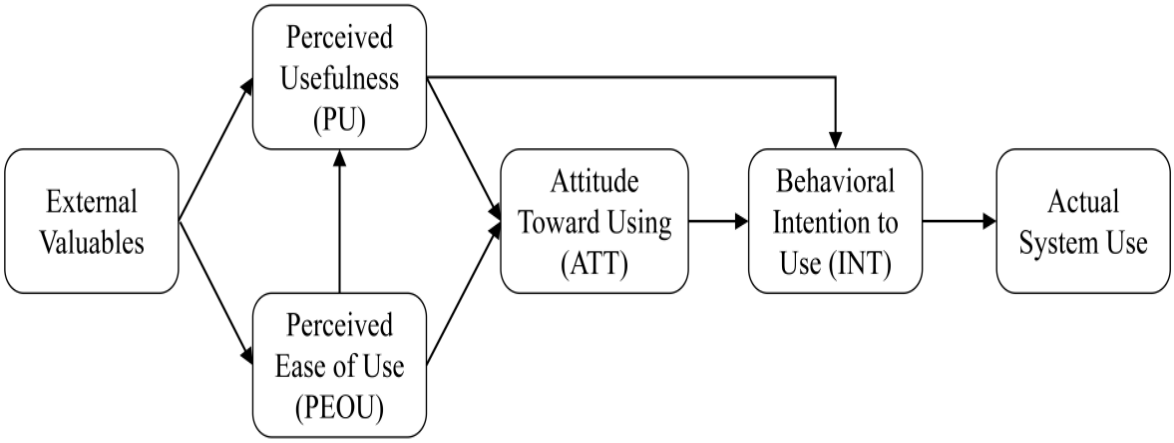

Figure 1: Theoretical Framework of Technology Acceptance Model (Davis, 1989)

To overcome these limitations in the context of urban Indian consumers' purchase intention toward electric motorcycles, this study employs an extended TAM, incorporating CA and PT as predictors of purchase intention. This adaptation is critical for capturing technology- and culture-specific concerns, consistent with prior research highlighting the need to tailor TAM to explain consumer purchase intentions toward green technologies in emerging economies (Bagozzi, 2007). By integrating these constructs, the study seeks to enhance the model's relevance to local contexts, where factors such as infrastructure reliability and societal trust may significantly influence the formation of purchase intention for electric motorcycles.

2.2 Empirical Studies Based on Technology Acceptance Model

The TAM theory has been widely utilized across diverse fields to elucidate factors shaping purchase intentions toward new technologies. Research demonstrates its adaptability in various contexts, making it relevant for understanding urban Indian consumers' purchase intention toward electric motorcycles.

2.2.1 Perceived Ease of Use

Perceived ease of use (PEOU), as a core construct of the Technology Acceptance Model, refers to the degree to which individuals believe that using a particular technology will require minimal effort (Davis, 1989). Grounded in cognitive psychology, PEOU underscores usability as a key factor in reducing purchase barriers, particularly for technologies that demand new skills or infrastructure. In addition, Avcı Yücel and Gülbahar (2013) identified PEOU and PU as critical for technology acceptance processes, showing that ease of use builds initial confidence while perceived utility sustains long-term engagement. In the context of electric motorcycles, while operational simplicity matters, emphasizing cost savings and environmental benefits is essential to motivate purchase. Similarly, Martin (2022), applying TAM to electric mobility, noted that enhancing ease of use decreases perceived purchase barriers and increases purchase intention. Thus, PEOU remains the foundation factor in explaining consumer behavior toward new technologies like electric motorcycles.

2.2.2 Perceived Usefulness

Perceived usefulness (PU), another core construct of the Technology Acceptance Model, refers to the degree to which an individual believes using a particular technology will improve task performance (Davis, 1989). As Avcı Yücel and Gülbahar (2013) highlighted, PU is the most influential factor affecting usage intention, with perceived usefulness directly shaping purchase decisions for new technologies. Martin (2022) further reinforced this notion, arguing that making PU apparent through tangible benefits,

such as lower operational costs or environmental advantages, is critical for driving purchase intention. Consequently, as a central construct in TAM, PU is a decisive factor in determining consumers' purchase intention toward new technologies.

2.2.3 Attitude

Attitude (ATT) reflects users' overall evaluative sentiment toward technology and is pivotal in shaping their intention to purchase it. Further, Martin (2022) explained the extended application of TAM by demonstrating that positive attitudes significantly influence behavioral intentions. In the context of electric motorcycles, presenting them as modern, efficient, and environmentally friendly can help foster favorable attitudes and promote purchase intention. Similarly, Malatji et al. (2020) identified attitude as a critical intermediary between perceived ease of use, perceived usefulness, and behavioral intention by underscoring the importance of communication strategies that combine both functional advantages and emotional resonance.

2.2.4 Consumer Awareness

Consumer awareness (CA) refers to individuals' understanding of a technology's benefits, functionality, and contextual factors, such as relevant policies and infrastructure. Within the TAM framework, CA functions as a critical external variable that shapes perceived usefulness and ease of use, ultimately influencing purchase intention. For instance, Theodorou and Meliones (2019) showed that awareness campaigns are vital in guiding consumer decisions regarding emerging technologies, as informed individuals are more likely to recognize advantages and exhibit a stronger intent to purchase. Similarly, in the context of electric mobility, Greener (2022) found that campaigns highlighting cost-effectiveness, government incentives, and environmental benefits reduce consumer hesitation, thereby strengthening their purchase intention. Therefore, strengthening CA not only enhances perceptions of usefulness but also directly contributes to increased purchase intention.

2.2.5 Perceived Trust

Perceived trust (PT) refers to consumers' confidence in a technology's reliability, safety, and credibility, and its surrounding ecosystem. Within the TAM framework, PT functions as an external variable that helps reduce perceived risk, thereby fostering more favorable attitudes and reinforcing purchase intention. In the healthcare context, Zogheib et al. (2025) found that perceived trust in telemedicine was significantly shaped by provider credibility and data security, which directly impacted users' intention to adopt the service. Applied to electric motorcycles, Lee et al. (2003) emphasized that transparent communication regarding safety features, quality assurance, and positive user experiences is crucial for establishing trust in the vehicle's reliability and performance. Thus, enhancing perceived trust is essential for encouraging purchase intention in high-involvement product decisions like electric motorcycle purchases.

As summarized in Table 1, these empirical studies link core TAM constructs—perceived ease of use (PEOU), perceived usefulness (PU), attitude (ATT), consumer awareness (CA), and perceived trust (PT)—to factors influencing urban Indian consumers' purchase intention towards electric motorcycles in urban India, thereby offering a foundational basis for identifying key determinants of purchase intention.

Table 1: Overview of Technology Acceptance Model Applications Across Various Fields

Authors	Title	Theory/Model	Field of Study	Independent Variables	Dependent Variable	Main Findings
Greener (2022)	Digging for Acceptance Theory	Modified TAM	Education	PU, PEOU, Context-Specific Modifications	Behavioral Intention to Use Technology	Context-specific factors like awareness are critical for behavioral intentions.
Martin (2022)	A Literature Review on The Technology Acceptance Model	Extended TAM	General Technology Acceptance	PEOU, PU, ATT	Behavioral Intention to Use Technology	Positive ATT, shaped by PEOU and PU, is essential for behavioral intentions.
Malatji et al. (2020)	Understanding the Usage, Modifications, and Criticisms of Technology Acceptance Model (TAM)	Extended TAM	General Technology Acceptance	PEOU, PU, ATT	Behavioral Intention to Use Technology	Positive ATT, shaped by PEOU and PU, is essential for behavioral intentions.
Theodorou and Meliones (2019)	Developing Apps for People with Sensory Disabilities	Modified TAM	Assistive Technology	PU, PEOU, Accessibility	Intention to Use Technology	Context factors like accessibility are critical for behavioral intentions.

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Authors	Title	Theory/Model	Field of Study	Independent Variables	Dependent Variable	Main Findings
Zogheib et al. (2015)	University Student Perceptions of Technology Use in Mathematics Learning	Extended TAM	Education Technology	Self-Efficacy, Subjective Norm, User Satisfaction, PEOU, PU	Behavioral Intention to Use Technology (MyMathLab Platform)	Social influence and self-efficacy play significant roles in shaping behavioral intentions.
Avcı Yücel and Gülbahar (2013)	Technology Acceptance Model: A Review of the Prior Predictors	TAM	Education and Business	PEOU, PU	Intention to Use Technology	PEOU is crucial but often mediated by PU, especially in complex technologies.
Lee, et al. (2003)	The Technology Acceptance Model: Past, Present, and Future	Extended TAM	General Technology Acceptance	PEOU, PU, Trust	Behavioral Intention to Use Technology	Trust in safety, reliability, and performance is key for consumer acceptance.

2.3 Hypothesis Development

The TAM and its extensions, such as the Unified Theory of Acceptance and Use of Technology (UTAUT) and the Environmental TAM, have been pivotal in understanding consumer purchase intentions toward electric vehicles and electric motorcycles. The following analysis synthesizes empirical evidence from TAM-based studies to derive hypotheses about factors influencing electric motorcycle purchase intention, focusing on constructs like perceived ease of use (PEOU), perceived usefulness (PU), attitude (ATT), consumer awareness (CA), and perceived trust (PT). Lastly, Table 2 summarizes empirical studies on electric motorcycles and vehicle behavioral intention using TAM, UTAUT, and related frameworks.

2.3.1 Impact of Perceived Ease of Use on Purchase Intention of Electric Motorcycles

In TAM, PEOU is a core construct reflecting the belief that using technology will be effort-free, directly shaping behavioral decisions. Empirical studies in emerging markets consistently support this role. For example, Diandra et al. (2023) examined electric vehicle purchase intentions in Jakarta, Indonesia, concluding that PEOU was a critical driver of user readiness. Similarly, Wilson and Prayitno (2023) applied TAM in Indonesia and demonstrated that user comfort, a key aspect of PEOU—was positively correlated with electric motorcycle purchase probability. These findings highlight the need for user-centered design to reduce perceived complexity. In the Indian context, perceived ease of use (PEOU) faces unique challenges, such as fragmented charging infrastructure—only 35% of Tier-2 cities have public charging stations (Niti Aayog, 2021)—and varying levels of EV literacy. Local innovations like Hero Electric's doorstep servicing model address maintenance anxieties in semi-urban areas, illustrating how usability solutions can mitigate purchase barriers. Global evidence confirms that when users perceive technology as easy to use—through intuitive designs, accessible support, or seamless infrastructure—their purchase intention increases, particularly when paired with purchase intentions (Davis, 1989). Based on the collective literature above, the first hypothesis is proposed:

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H1: There is a significant relationship between perceived ease of use and electric motorcycle purchase intention.

2.3.2 Impact of Perceived Usefulness on Purchase Intention of Electric Motorcycles

Perceived usefulness is another key construct in the Technology Acceptance Model, which refers to the belief that technology will improve performance or offer tangible benefits. Previous research studies across electric vehicle contexts have consistently linked perceived usefulness and purchase intentions. For example, Diandra et al. (2023) identified perceived usefulness as a key determinant of electric vehicle purchase intention in Jakarta, with cost savings, reduced pollution, and technological superiority as primary drivers. Similarly, Zhang and Chang (2023) found that in price-sensitive markets like Taiwan, perceived usefulness alongside government incentives was a critical predictor for Generation Z consumers by emphasizing practical benefits over environmental motivations. Like India, perceived usefulness is particularly salient due to the cost-conscious nature of the economy. For instance, the "Save ₹1.5 Lakh" campaign leverages long-term fuel savings to appeal to urban consumers, reflecting how tangible advantages drive consideration (Martin, 2022). While regional priorities may vary—such as rural users prioritizing battery range—the overarching role of PU remains consistent: Consumers are more likely to intend to purchase when a technology aligns with their functional or economic needs. Accordingly, the second hypothesis is proposed in this study.

H2: There is a significant relationship between perceived usefulness and electric motorcycle purchase intention.

2.3.3 Impact of Attitude on Purchase Intention of Electric Motorcycles

As a core TAM construct, attitude reflects consumers' overall favorable or unfavorable evaluation of a technology, directly shaping behavioral intention (Ajzen, 1991).

Empirical studies consistently show that positive attitudes drive higher purchase intention among consumers. For instance, Liu and Lai (2020) found a significant positive relationship between attitude and electric motorcycle purchase intention in Macau, particularly when perceived environmental benefits like pollution reduction and energy efficiency shaped attitudes. Urban consumers often associate electric motorcycles with modernity and environmental consciousness—a narrative reinforced by aspirational marketing strategies (Theodorou & Meliones, 2019). Indian consumers tend to develop stronger attitudes toward electric motorcycles when both practical benefits (e.g., cost savings, policy incentives) and ethical values (e.g., environmental responsibility) are met, reflecting a combination of rational and normative motivations, thereby enhancing their purchase intentions (Diandra et al., 2023). Based on this evidence, the third hypothesis is proposed:

H3: There is a significant relationship between attitude and electric motorcycle purchase intention.

2.3.4 Impact of Consumer Awareness on Purchase Intention of Electric Motorcycles

Consumer awareness is a foundational antecedent to purchase intention, defined as knowledge of a technology's attributes, benefits, and contextual relevance. A past study by Diandra et al. (2023) found that environmental awareness positively influenced electric vehicle attitudes by aligning sustainable consumption with personal values in Jakarta. These findings aligned with those of Abbasi et al. (2021), who concluded that perceived environmental knowledge is a key driver of EV adoption. Educational campaigns can significantly promote awareness, bridge knowledge gaps, and enhance purchase intentions. In the Indian context, consumer awareness can be explained in three interrelated dimensions: environmental benefits (reduced emissions, global sustainability alignment), economic incentives (FAME II subsidies, tax exemptions), and practical features (low running costs, charging infrastructure availability). Consumers are aware of the benefits of electric vehicles, which tend to promote their intention to purchase them. This aligns with findings by Moyo and Masuku (2018), who moted that consumers

with high environmental awareness are more likely to purchase new energy vehicles. Hence, the fourth hypothesis is formulated:

H4: There is a significant relationship between consumer awareness and electric motorcycle purchase intention.

2.3.5 Impact of Perceived Trust on Purchase Intention of Electric Motorcycles

Perceived trust is pivotal in influencing the intention to adopt new technologies, particularly in high-involvement purchases like electric motorcycles. Wilson and Prayitno (2023) highlighted policy measures in Indonesia as key builders, showing that government-backed infrastructure and safety standards enhanced consumer confidence in electric motorcycles and significantly reduced purchase hesitancy. Similarly, Murtiningrum et al. (2022) identified perceived trust in battery safety, manufacturer credibility, and policy consistency as pivotal for overcoming purchase barriers in Southeast Asia. Consumers tend to purchase it when their concerns and barriers are reduced due to their high perceived trust toward a product. These findings are consistent with Lady and Angelino (2024), who found that brand trust significantly positively impacted electric car purchase intention in Indonesia. Their results suggest that consumers who trust electric vehicles' advantages are more likely to exhibit a strong intention to purchase them. Further, Yeğin and Ikram (2022) also found that green trust positively and significantly affects electric vehicle purchase intentions. Their study highlights that when consumers perceive a brand as genuinely committed to environmental sustainability, their trust in the brand strengthens, which in turn enhances their willingness to adopt electric vehicles. Based on this evidence, the last hypothesis is proposed:

H5: There is a significant relationship between perceived trust and electric motorcycle purchase intention.

Table 2: Technology Acceptance Model and Its Extended Models in Electric Motorcycles and Vehicles Behavioral Intention

Authors	Title	Theory Model	Field of Study	Independent Variables	Dependent Variable	Main Findings
Diandra et al. (2023)	Electric Vehicle Adoption and Sustainability in the Urban City: A Technology Acceptance Model Analysis	TAM	EVs	Self-image motives, environmental awareness, government policies	Intention to purchase EVs	Pro-environmental and pro-innovative motives influence adoption; government policies and infrastructure are crucial.
Wilson and Prayitno (2023)	Assessing Factors Determining People's Decision to Adopt Electric Motorcycles (EMs) Through the Lens of the Technology Acceptance Model (TAM)	TAM	Electric Motorcycles	PEOU, PU, government influence	Intention to purchase electric motorcycles	PEOU and PU are critical; government initiatives play a significant role.
Zhang and Chang (2023)	Applying the Extended Technology Acceptance Model to Explore Taiwan's Generation Z's Behavioral Intentions Toward Using Electric Motorcycles	Extended TAM	Electric Motorcycles	PU, PEOU, value propositions, government policies	Behavioral intentions toward using electric motorcycles	Practical benefits and government incentives drive adoption more than environmental concerns.

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Authors	Title	Theory Model	Field of Study	Independent Variables	Dependent Variable	Main Findings
Abbasi et al. (2021)	Consumer Motivation by Using Unified Theory of Acceptance and Use of Technology towards Electric Vehicles	UTAUT	EVs	Effort expectancy, technophilia, perceived environmental knowledge	Intention to purchase EVs	Ease of use and environmental knowledge significantly impact adoption.
Liu and Lai (2020)	The Effects of Environmental Policy and the Perception of Electric Motorcycles on the Acceptance of Electric Motorcycles: An Empirical Study in Macau	Environmental TAM	Electric Motorcycles	Environmental policy, pollution reduction, energy saving, driving performance	Behavioral intentions toward using electric motorcycles	Positive experiences with environmental policies increase EV acceptance; driving performance is crucial.

The hypotheses are followed by a proposed framework of this study presented in Figure 2.

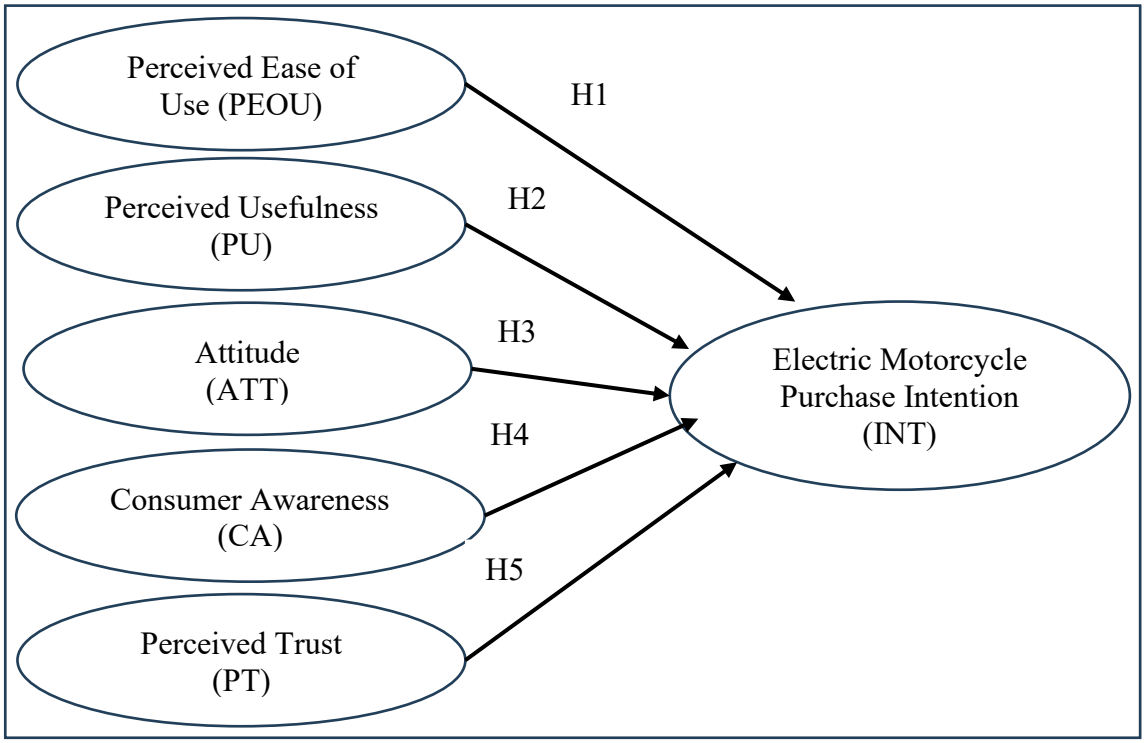

Figure 2: Research Framework for Purchase Intention of Electric Motorcycle

3.0 Methodology

3.1 Research Design

This research employs a structured, quantitative approach to systematically identify factors affecting the purchase intention of electric motorcycles in urban India. By extending the TAM, the study examines five key independent variables— Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Attitude (ATT), Consumer Awareness (CA), and Perceived Trust (PT)—to assess their interrelations and collective impact on electric motorcycle purchase intention. This expanded framework ensures a robust analysis of correlations between constructs, aligning with the study's objectives to generate reliable and valid insights into electric motorcycle adoption dynamics.

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3.2 Sampling

The target population comprises urban Indian consumers with prior awareness of EVs, ensuring a foundational understanding of electric motorcycles to analyze behavioral intention within a technology-acquainted subgroup. The sampling frame encompassed India's diverse urban landscape via online surveys, including participants from metropolitan, small, and mid-sized cities. This approach captures natural variations in urban EV awareness—from metropolises grappling with traffic and pollution to smaller towns with evolving mobility needs—strengthening generalizability across heterogeneous contexts. A simple random sampling technique was employed to minimize selection bias and enhance generalizability, ensuring equal inclusion probability for all eligible population members, as recommended for quantitative studies seeking objective representation (Noor et al., 2022). Eligibility was determined by a screening question—"Have you heard of electric vehicles before this?"—to ensure baseline knowledge necessary for evaluating purchase intention determinants..

Data was collected from 153 respondents. A post hoc power analysis was conducted using G*Power to assess the adequacy of the sample size (Faul et al., 2007). Assuming a moderate effect size ($f^2 = 0.15$), an alpha level of 0.05, and five predictors, the analysis indicated that a sample size of 153 achieves a statistical power of 0.90. This exceeds the conventional threshold of 0.80 recommended by Cohen (1988), suggesting that the sample is sufficient to detect meaningful effects while maintaining a balance between statistical rigor and practical feasibility in exploratory research. This aligns with established methodology in technology-related studies: Cohen (1988) defines moderate effect sizes (0.15–0.20) and recommends 85–150 participants for multivariate analyses to achieve adequate power. Empirical support for this approach is drawn from established methodology in technology-related research. For instance, Venkatesh et al. (2003) demonstrated robust TAM validation with samples as small as 120, emphasizing that moderate samples establish foundational insights in complex populations. The 153-respondent dataset meets these criteria, providing sufficient statistical power to identify meaningful associations and a valid basis for generating hypotheses to guide subsequent large-scale research.

3.3 Research Instrument

A structured questionnaire was used to measure constructs from the extended TAM framework, incorporating validated scales from prior studies to ensure reliability and content validity. The Likert scale ranged from 1 = strongly disagree to 5 = strongly agree, and the survey questions are outlined in Table 3 below.

Table 3: Survey Questions for Assessing Factors Influencing the Purchase Intention of Electric Motorcycles in Urban India

Section	Label	Questions	Sources
PEOU	**PEOU1**	I believe using an electric motorcycle would be easy for me.	Adapted from Wilson and Prayitno (2023)
	PEOU2	Learning to operate an electric motorcycle is straightforward.	
	PEOU3	I think I could easily become skillful at using an electric motorcycle.	
	PEOU4	Electric motorcycles are convenient to use in daily life.	
PU	**PU1**	Using an electric motorcycle would improve my efficiency in daily commuting.	Adapted from Zhang and Chang (2023)
	PU2	Electric motorcycles are beneficial for reducing pollution.	
	PU3	Electric motorcycles can help me save money on fuel costs.	
	PU4	Overall, electric motorcycles would enhance my quality of life.	
ATT	**ATT1**	I have a favorable attitude towards using electric motorcycles.	Adopted from Wilson and Prayitno (2023)
	ATT2	Electric motorcycles are a good idea for modern urban transportation.	
	ATT3	I think using electric motorcycles is a wise decision.	
	ATT4	Electric motorcycles fit well with my lifestyle.	
CA	**CA1**	I am aware of the environmental benefits of using electric motorcycles.	Adapted from Zhang and Chang (2023)
	CA2	I am knowledgeable about the different brands and models of electric motorcycles available.	

Section	Label	Questions	Sources
	CA3	I understand how electric motorcycles can contribute to sustainability.	
	CA4	I am informed about the government policies and incentives for purchasing electric motorcycles.	
PT	**PT1**	I trust that electric motorcycles are safe to use.	Adopted from Liu and Lai (2020)
	PT2	I believe electric motorcycles are reliable and won't break down easily.	
	PT3	I have confidence in the performance of electric motorcycles.	
	PT4	I trust the information provided by manufacturers about electric motorcycles.	
INT	**INT1**	I intend to purchase an electric motorcycle within the next 12 months.	Adopted from Liu and Lai (2020)
	INT2	I am likely to recommend electric motorcycles to others.	
	INT3	I will consider an electric motorcycle as my next vehicle purchase.	
	INT4	Given the opportunity, I would prefer to buy an electric motorcycle over a conventional motorcycle.	

The questionnaire underwent a two-stage validation process. First, an expert review was conducted by three independent researchers specializing in consumer behavior and EV acceptance, who evaluated the clarity, relevance, and theoretical consistency to ensure alignment with the study's conceptual framework. Following this stage, a pilot test with 25 eligible participants assessed internal consistency and ambiguities. A convenience sample of 25 participants meeting the main study's eligibility criteria completed the questionnaire via Google Forms, providing feedback on question clarity and technical usability. Statistical analysis of pilot data revealed Cronbach's alpha values exceeding 0.70 for all constructs, satisfying reliability thresholds (Tavakol & Dennick, 2011). Minor revisions were made based on feedback—such as rephrasing ambiguous items and optimizing response options—to enhance comprehension and psychometric integrity. This iterative approach to validation

strengthens the instrument's suitability for measuring the study's target constructs in the context of urban Indian consumers' purchase intention toward electric motorcycles.

4.0 Results and Discussion

4.1 Demographic Profile of Respondents

The study cohort comprised 153 participants representing urban Indian populations across socioeconomic strata. The sample showed that 150 males, comprising 98.03%, and three females, comprising 1.97%, were involved in this study. In terms of age, 32.03% (n=49) of respondents were 26–35 years old, 30.72% (n=47) were 36–45 years old, 16.99% (n=26) were 19–25 years old, 8.50% (n=13) were 18 years old or younger, 7.19% (n = 11) were 46–55 years, and 4.58% (n = 7) were over 55 years. Regarding income levels, 32.03% (n=49) reported annual incomes of ₹200,000–₹500,000, 32.03% (n=49) reported ₹500,000–₹1,000,000, 20.26% (n=31) reported above ₹1,000,000, and 15.69% (n=24) reported below ₹200,000. Geographically, 16.99% (n=26) were from Delhi, 14.38% (n=22) from Pune, 9.15% (n=14) from Chennai, 7.84% (n=12) from Bangalore, and 51.63% (n=79) from other smaller cities.

Vehicle ownership data showed that 75.29% (n=115) of respondents currently owned a vehicle, while 24.71% (n=38) did not. Awareness of electric motorcycles was high, with 99.35% (n=152) of respondents indicating familiarity; only one respondent (0.65%) was unaware and excluded from the analysis. In short, the sample was predominantly male, working-age (26–45 years old), and urban-residing, with a balanced distribution across the middle to higher income brackets. These characteristics provide a critical contextual foundation for interpreting relationships between independent variables and the purchase intention of electric motorcycles, enabling nuanced insights into consumer behavior drivers within this population.

4.2 Reliability Analysis

Reliability ensures that construct items consistently measure the same underlying concept (Tavakol & Dennick, 2011). Cronbach's alpha assessed internal consistency, with values above 0.70 generally considered acceptable. As presented in Table 4, all constructs—PEOU, PU, ATT, CA, PT, and INT—exhibited Cronbach's alpha values exceeding 0.85, indicating high internal consistency and reliable measurement of their respective concepts. According to Zulkifli et al. (2024), reliability levels were classified using established thresholds: coefficients above 0.90 indicate excellent reliability, 0.80–0.89 denote good reliability, and 0.70–0.79 represent acceptable reliability.

Table 4: Reliability Analysis of Constructs

Variables	Cronbach's Alpha	Number of Items	Reliability Level
PEOU	0.865	4	Good
PU	0.855	4	Good
ATT	0.879	4	Good
CA	0.857	4	Good
PT	0.928	4	Excellent
INT	0.913	4	Excellent

All constructs achieved at least a "Good" reliability level, with PT and INT reaching "Excellent," confirming that the measurement instruments exhibit stable internal consistency and meet the reliability requirements for subsequent analysis.

4.3 Multiple Regression Analysis

Multiple regression analysis explored the relationship between the dependent and independent variables. This technique effectively models how multiple predictors jointly influence a single outcome (Field, 2013; Leong et al., 2024), identifying key drivers of electric motorcycle purchase intention in urban India. In Table 5, the R-Square value of 0.743 indicated that the model explained 74.3% of the variation in purchase intention

toward electric motorcycles. As indicated by Cohen (1988), the R-squared value was greater than 0.70, indicating that the effect size of the model was strong and that predictors explained a substantial amount of variance in the dependent variable. Also, the adjusted R-squared of 0.735 further validated the model's explanatory power.

Table 5：Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.862	0.743	0.735	0.42754

Table 6 revealed the results of the ANOVA test on the overall significance of the regression model, where the F-statistic of 84.590 and a p-value less than 0.001 indicate that the overall model is statistically significant. This result implies that all independent variables jointly significantly affect the intention to purchase an electric motorcycle. Therefore, the model has predictive capabilities and is fully validated (Tabachnick & Fidell, 2019).

Table 6：ANOVA Test

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	77.309	5	15.462	84.590	< 0.001
Residual	26.687	146	0.183		
Total	103.996	151			

Table 7：Coefficients Test of Key Variables

Predictor	Unstandardised Coefficients (B)	Std. Error	Standardised Coefficients (β)	t	Sig.	VIF
(Constant)	-0.314	0.209		-1.505	0.135	
PEOU	0.157	0.085	0.139	1.847	0.067	3.223

PU	0.191	0.096	0.168	1.983	0.049	4.081
ATT	0.540	0.102	0.459	5.302	< 0.001	4.260
CA	-0.057	0.072	-0.049	-0.786	0.433	2.214
PT	0.239	0.075	0.214	3.187	0.002	2.564

Table 7 presents the multiple regression analysis examining predictors of consumers' purchase intention toward electric motorcycles in urban India. The model indicates that PU ($\beta = 0.168$, $p = 0.049$), ATT ($\beta = 0.459$, $p < 0.001$), and PT ($\beta = 0.214$, $p = 0.002$) are significant positive predictors of purchase intention. ATT exerts the most potent effect, while PEOU ($\beta = 0.139$, $p = 0.067$) trends toward marginal significance, and CA ($\beta = - 0.049$, $p = 0.433$) shows no significant association. Additionally, all Variance Inflation Factor (VIF) values are below the threshold of 10, indicating that multicollinearity is not an issue in this model, which is essential for the reliability of regression results (Hair et al., 2014).

4.4 Discussion

The results of hypothesis testing examining the relationships between key factors—PEOU, PU, ATT, CA, and PT—and consumer purchase intention toward electric motorcycles are presented in Table 8. Multiple regression analysis revealed the following:

H1 proposed that PEOU would be a key determinant of purchase intention. However, the p-value for PEOU was 0.067, exceeding the conventional significance threshold of 0.05, indicating that the relationship was not statistically significant. Thus, H1 was not supported. This finding diverges from foundational TAM studies (Davis, 1989; Venkatesh & Davis, 2000), consistently identifying ease of use as a primary driver of technology-related purchase intention. The discrepancy may stem from context-specific priorities among urban Indian consumers, who prioritise pragmatic benefits such as cost savings and environmental impact over technological usability when forming purchase intention. This aligns with recent EV research on purchase intention in emerging markets (Bhasin & Srivastava, 2024), highlighting economic and ecological

motives as stronger predictors than PEOU. Further, Bagga et al. (2024) emphasise that cost savings and driving range emerge as critical factors shaping Indian consumers' EV purchase intentions, with a clear preference for "result-oriented" benefits (e.g., monetary savings) over "process experience" (e.g., operational smoothness).

H2 proposed a significant relationship between PU and the purchase intention of electric motorcycles. The results supported this hypothesis by showing a positive and significant association. This finding corroborates TAM-based research on consumer decision-making (Venkatesh et al., 2003; Bagozzi, 2007), where pragmatic utility has been shown to predict purchase intention strongly. In the context of electric motorcycles, consumers likely evaluate these products based on tangible benefits such as reduced operating costs and environmental sustainability, consistent with contemporary studies on Eco-technology purchase behavior (Jaiswal et al., 2022; Xiao & Goulias, 2022). These results reinforce that perceived usefulness, grounded in real-world value, remains a critical driver of purchase intention for sustainable products, particularly in markets where cost-efficiency and environmental consciousness are prominent considerations. This study also further supported H3 by indicating that positive attitudes toward electric motorcycles, shaped by social responsibility and environmental concerns, significantly enhance purchase intention. The robust relationship between ATT and INT reinforces theories of reasoned action (Ajzen, 1991; Fishbein & Ajzen, 1975) and recent research on the purchase intention of green products (Lavuri et al., 2022; Rahmawati et al., 2022). For example, Rahmawati et al. (2022) found that attitude is the primary factor influencing Indonesian consumers' purchase intention for electric motorcycles, with respondents strongly associating such purchases with environmental responsibility and positive behavioral evaluations. Marketers should thus aim to cultivate favorable attitudes by emphasizing electric motorcycles' social and environmental value.

H4 hypothesized a significant relationship between CA and the INT of electric motorcycles, but the analysis showed no significant association, leading to the rejection of H4. These results suggest that while consumers are broadly aware of the product, this awareness does not directly translate into stronger purchase intention. Earlier studies have highlighted consumer awareness as a foundational driver of green product intention (Theodorou & Meliones, 2019; Greener, 2022), but recent research in sustainable

technology contexts emphasizes that awareness alone is insufficient to motivate action without complementary factors such as perceived usefulness, trust, or behavioral incentives (Singh et al., 2023). Similarly, Jayasingh et al. (2021) found that even when consumers exhibit strong foundational knowledge about products like electric motorcycles, mere awareness is insufficient to drive purchase decisions. Their analysis of the Indian electric two-wheeler market revealed that consumers' purchase intention is primarily shaped by perceived economic gains (e.g., lower operational costs), product reliability, and the availability of charging infrastructure.

H5 proposed that PT would positively influence INT and confirmed PT as a critical factor in this study. These results align with research on trust's role in technology-related purchase decisions (Gefe et al., 2003; Lee et al., 2003) and recent EV studies emphasizing trust in product safety and corporate credibility (Zhang & Chang, 2023). For electric motorcycles, consumer intention hinges on trust in both product reliability and manufacturer credibility. In addition, Bagga et al. (2024) demonstrated that consumers' trust in products, such as battery life and safety, and enterprises, including after-sales support, increases, and their purchase intention strengthens. In summary, the findings indicate that PU, ATT, and PT significantly influence electric motorcycle purchase intention in urban India, while PEOU and CA do not play statistically significant roles. For marketers and policymakers, strategies emphasizing practical benefits (e.g., cost savings), cultivating positive brand perceptions, and enhancing trust (e.g., through certifications or warranties) are recommended. Awareness campaigns, meanwhile, may require integration with behavioral nudges (e.g., subsidies and peer testimonials) to bridge the gap between knowledge and action.

Table 8: Hypothesis Testing Summary with Results

Hypotheses	Statement	Result	Conclusion
H1	There is a significant relationship between PEOU and the Purchase Intention of Electric Motorcycles.	Not Significant	Not Supported

Hypotheses	Statement	Result	Conclusion
H2	There is a significant relationship between PU and the Purchase Intention of Electric Motorcycles.	Significant	Supported
H3	There is a significant relationship between ATT and the Purchase Intention of Electric Motorcycles.	Highly Significant	Strongly Supported
H4	There is a significant relationship between CA and the Purchase Intention of Electric Motorcycles.	Not Significant	Not Supported
H5	There is a significant relationship between PT and the Purchase Intention of Electric Motorcycles.	Significant	Supported

5.0 Conclusion and Future Research

This study employs an extended TAM to investigate the factors influencing urban Indian consumers' purchase intention toward electric motorcycles, integrating constructs such as PU, PEOU, ATT, CA, and PT. By focusing on purchase intention as the dependent variable, the research provides insights into sustainable technology taking root in emerging markets by identifying key determinants and contextual specificities that shape consumer behavior.

The analysis reveals that PU, ATT, and PT significantly impact the purchase intention of electric motorcycles in urban India. Urban Indian consumers prioritize tangible benefits (PU) of electric motorcycles, including cost savings and environmental advantages, alongside positive attitudes (ATT) toward sustainability and trust (PT) in product safety and manufacturer reliability. In contrast, PEOU and CA do not emerge as statistically significant factors of purchase intention. These results partially align with traditional TAM frameworks (Davis, 1989; Venkatesh & Davis, 2000), which emphasize cognitive factors like usefulness and ease of use, but they also challenge the model's

foundational emphasis on ease of use in predicting purchase intention. The divergence underscores the primacy of pragmatic and affective drivers in the context of forming purchase intention toward electric motorcycles, a pattern consistent with recent research on EV acceptance in emerging economies where economic efficiency and ecological values take precedence over technological usability (Bhasin & Srivastava, 2024).

The study makes theoretical contributions by expanding TAM to incorporate emotional and trust-based constructs relevant to purchase intention. While TAM traditionally focuses on rational evaluations of technology, this research highlights that attitudes (ATT), rooted in social and environmental values, and perceived trust, reflecting confidence in product reliability and corporate transparency, are critical for high-involvement decisions such as electric motorcycle purchases. This notion aligns with contemporary calls for hybrid theoretical models that integrate pragmatic and affective dimensions when explaining consumer purchase intention, particularly in contexts characterized by technological uncertainty and high consumer risk perception (Nguyen-Phuoc et al., 2024). By demonstrating the role of these factors, the research underscores the need for multi-faceted frameworks that capture the complex interplay of cognitive, emotional, and relational elements in shaping sustainable technology purchase intention.

For practical applications, the findings suggest that marketers should emphasize electric motorcycles' economic and ecological benefits to enhance perceived usefulness, cultivate positive attitudes through narratives that link ownership to social responsibility, and build trust by ensuring transparency in product information and offering warranties or certifications—all pivotal for strengthening purchase intention. Policymakers, meanwhile, should design targeted interventions such as subsidies, tax incentives, and improved charging infrastructure to bridge the gap between awareness and action, complemented by regulatory measures that enforce safety and quality standards to bolster consumer confidence in their purchase intention. Environmental activists can leverage the alignment between individual consumer benefits and broader sustainability goals to position electric motorcycles as essential solutions for urban air quality and carbon reduction targets, thereby integrating them into comprehensive mobility strategies that enhance purchase intention drivers.

Despite these contributions, the study has limitations, including a cross-sectional design, a relatively small sample size, and reliance on self-reported data, which may affect generalizability and introduce response bias. Future research could address these gaps by adopting longitudinal or experimental methodologies to track how trust and attitudes evolve over time, incorporating qualitative methods to explore cultural and regional nuances in trust formation, and expanding the model to include social influence factors such as subjective norms. Replicating the study in rural Indian contexts and comparing purchase intention patterns across different EV types would further address regional disparities while examining the long-term effects of policy interventions and infrastructure investments, which could provide deeper insights into accelerating market transition driven by enhanced consumer purchase intention. In conclusion, this research highlights the central roles of perceived usefulness, attitude, and perceived trust in shaping urban Indian consumers' intention to purchase electric motorcycles. By addressing these factors through targeted strategies, stakeholders can effectively promote sustainable mobility solutions, aligning consumer preferences with global environmental goals and fostering a greener future in urban centers. Integrating theoretical insights with practical implications positions this study as a valuable resource for researchers, marketers, policymakers, and activists working to advance EV purchase intention in emerging markets.

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