SCALABLE INNOVATIVE FACTORS FOR SHAPING CONSUMER INTENTIONS ON ELECTRIC TWO-WHEELERS ADOPTIONS

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Abstract. Electric two-wheelers (ETWs) have emerged as a dominant choice over traditional counterparts in global consumer markets, prompting a shift in consumer behaviour. While existing research has delved into the adoption of ETWs, there remains a notable gap in understanding the intricate factors driving consumer adoption, particularly their inclination toward innovation. This study investigates the landscape of ETWs in India, focusing on facilitating conditions, pricing dynamics, personal innovativeness, and behavioral intentions. Utilizing the Unified Theory of Acceptance and Use of Technology (UTAUT) framework, 220 Indian ETW users were surveyed to elucidate the interplay between facilitating conditions, price, and behavioral intentions, mediated by personal innovativeness. The findings underscore the significant impact of facilitating conditions and price on behavioral intentions, with personal innovativeness serving as a pivotal mediator in this relationship. Moreover, this study underscores the importance for ETW businesses to prioritize user-friendly designs, ensuring a seamless and enjoyable experience for consumers. Furthermore, targeting highly innovative consumers emerges as a strategic imperative for businesses in devising effective marketing strategies. By shedding light on facilitating conditions, price dynamics, personal innovation, and behavioral intentions, this study contributes valuable insights to the existing literature. In terms of environmental sustainability, the scalability of electric two-wheelers contributes to reducing greenhouse gas emissions and mitigating air pollution in urban areas. As more individuals switch from gasoline-powered vehicles to electric two-wheelers, the collective impact on reducing carbon emissions and improving air quality becomes increasingly significant, especially in densely populated regions where transportation-related pollution is a major concern. Additionally, it offers a nuanced understanding of the mediating role of personal innovation in the context of ETWs, thereby informing future research and strategic initiatives in the field of electric mobility.

Key words: Electric two-wheelers, Innovative nature, Unified Theory of Acceptance and Use of Technology (UTAUT), Marketing strategies, User experience, Global consumer behavior, Technology acceptance

1. Introduction. Consumers' experiences with conventional vehicles have changed because of the rise of electric vehicles. Since the previous ten years, people have started using ETWs to carry out their regular duties. Consumers will become increasingly reliant on their ETWs because of their growing reliance on them for all purchases. The adoption of electric two-wheelers (ETWs) is gaining momentum in India, as the government and private sector invest in infrastructure and incentives to promote this technology. ETWs offer several advantages over traditional fuel-powered vehicles, including lower emissions, lower operating costs, and a quiet ride. However, there are still some barriers to adoption, such as the lack of facilitating conditions and the high price of ETWs. Facilitating conditions refer to the factors that make it easier or more difficult to adopt a new technology. For ETWs, these factors include the availability of public charging stations, the cost of ETWs, and the government's policies on ETWs. Price is another important factor that influences the adoption of ETWs. ETWs are still relatively expensive, and this can be a barrier for some consumers.

The goal of prior research has been to examine the technology influences on consumer behavior. However, very few research have investigated the personal traits that affect behavioural intention. This study bridges the gap by investigating the personal characteristic of personal innovativeness. We hypothesize that personal

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innovativeness will mediate the relationship between facilitating conditions and price on ETW behavioural intention. We will examine the effects of facilitating conditions, price, and personal innovativeness on ETW behavioural intention among Indian customers. We will use the Unified Theory of Acceptance and Use of Technology (UTAUT) framework to understand how these factors influence behavioural intention.

In India, two-wheelers account for a significant share of the transportation market. In 2020, two-wheelers accounted for about 26% of all vehicles registered in India. The popularity of two-wheelers is due to several factors, including their affordability, their convenience, and their ability to navigate congested streets. ETWs offer several advantages over traditional fuel-powered two-wheelers. ETWs produce zero emissions, which is a major advantage in a country like India, where air pollution is a major problem. ETWs also have lower operating costs, as they do not require gasoline. Additionally, ETWs are quieter than traditional two-wheelers, which is an advantage in crowded cities. The government of India has taken several steps to promote the adoption of ETWs. In 2019, FAME India (Faster Adoption and Manufacturing of Hybrid and Electric Vehicles) is a government initiative, which provides subsidies for the purchase of ETWs. The government has also announced plans to build a network of public charging stations for ETWs. The private sector is also playing a role in promoting the adoption of ETWs. Several companies, such as Hero Electric, Bajaj Auto, and Ather Energy, are manufacturing ETWs in India. Companies are investing in research and development to improve the performance and affordability of electric two-wheelers (ETWs). This is likely to lead to an increase in ETW adoption in India in the coming years. The government's support for ETWs and the efforts of the private sector are likely to make ETWs more affordable and accessible to consumers. Additionally, the increasing awareness of the environmental benefits of ETWs is likely to drive demand for these vehicles. As a result, it has been decided to investigate the factors that influence ETW adoption in India, with a specific focus on technological factors and personal innovativeness.

2. Research model and hypothesis development.

2.1. Electric Two-Wheeler in India. Electric two-wheeler vehicles (ETVs) in the Indian context refer to electric-powered two-wheeled vehicles, such as electric scooters and electric motorcycles, that run on electricity rather than conventional fossil fuels like petrol or diesel. These vehicles have gained significant popularity in India in recent years due to the growing concern over air pollution, increasing fuel prices, and the need for sustainable transportation solutions. ETVs are equipped with a rechargeable battery that provides power to an electric motor. The battery is charged using electricity from a regular household power outlet or specialized charging stations. One of the primary advantages of ETVs is that they produce zero tailpipe emissions, making them environmentally friendly and contributing to reduced air pollution and greenhouse gas emissions. ETVs are generally more cost-effective to operate compared to conventional internal combustion engine vehicles as electricity is usually cheaper than petrol or diesel, resulting in lower running costs. They have fewer moving parts and a simpler drivetrain compared to internal combustion engine vehicles, leading to reduced maintenance requirements and lower maintenance costs. ETVs operate silently, contributing to a quieter environment and reducing noise pollution in urban areas.

To promote the adoption of electric vehicles, the Indian government has introduced various incentives, such as subsidies, tax benefits, and reduced registration fees, to make ETVs more affordable for consumers. The range of ETVs varies depending on the battery capacity and type, with some models offering ranges suitable for short commutes and city use. The availability of charging infrastructure, including public charging stations, is continuously expanding in major Indian cities. As awareness about environmental concerns and the benefit of electric mobility grows, the demand for ETVs in India has been steadily increasing, leading to the entry of numerous manufacturers offering a variety of electric two-wheeler models.

Electric two-wheeler vehicles have emerged as a promising solution for sustainable and eco-friendly urban transportation in India. As the government and industry continue to work on overcoming challenges and improving the overall ecosystem for electric mobility, ETVs are likely to play a significant role in transforming India's urban transportation landscape and contributing to a greener and cleaner future.

The adoption of electric two-wheeler vehicles (ETVs) has gained significant attention in recent years due to the pressing need for sustainable transportation solutions and the increasing environmental concerns associated with conventional fuel-powered vehicles. Among the various factors influencing consumers' intentions to adopt ETVs, facilitating conditions and price play crucial roles. This literature review aims to explore and synthesize

the existing research on how facilitating conditions and price influence Indian consumers' adoption intentions for ETVs, considering the mediating effect of personal innovativeness.

2.2. Unified Theory of Acceptance and Use of Technology (UTAUT2). Most research studies on consumer acceptance in the electric two-wheeler context have traditionally relied on well-established technology acceptance theories. These theories include the Theory of Reasoned Action (TRA) (Jiang, 2009), Innovation Diffusion Theory (IDT) (Lu et al., 2011), Technology Acceptance Model (TAM) (Davis, 1989; Davis et al., 1992), Motivational Model (MM) (Davis et al., 1992), Theory of Planned Behaviour (TPB) (Ajzen, 1991; Schifter & Ajzen, 1985), Model of PC Utilization (MPCU) (Thompson et al., 1991), Decomposed Theory of Planned Behaviour (DTPB) (Taylor & Todd, 1995), Innovation Diffusion Theory (IDT) (Moore & Benbasat, 1991), and Socio Cognitive Theory (SCT) (Compeau & Higgins, 1995). While the TAM has been widely used in technology acceptance research, it has some limitations, particularly in explaining the acceptance and usage of technology (Dai & Palvia, 2008). In 2003, to address these limitations and consolidate insights from the theories, Venkatesh et al. introduced the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2). This comprehensive theoretical framework was selected as the foundation for the current research study on consumer acceptance of electric two-wheelers, alongside individual variables.

The seven essential constructs of UTAUT2 performance expectancy, effort expectancy, social influence, facilitating conditions, price, hedonic motivation, and habit form the foundation of the model and shape our understanding of consumer behavior towards technology adoption and usage.

The primary focus of this study is the behavioural intention of consumers to adopt electric two-wheelers as their preferred mode of transportation. Understanding the impact of facilitating conditions and price within the UTAUT2 framework is crucial for comprehending the factors that influence consumer behaviour and intention to adopt electric two-wheelers.

Facilitating conditions, such as the availability and accessibility of charging infrastructure, government incentives, and after-sales support services, play a vital role in influencing consumers towards electric two-wheeler adoption. Moreover, the price of electric two-wheelers, along with any associated financial incentives or subsidies, can significantly influence consumers' decision-making process and their intention to adopt this eco-friendly mode of transportation. By considering these contextual factors of facilitating conditions and price within the UTAUT2 framework, researchers and industry stakeholders can develop targeted strategies to enhance consumer acceptance and adoption of electric two-wheelers in the Indian context.

2.3. Behavioural Intension to Adopt Electric Two-Wheeler. An established predictor known as behavioral intention can be used to forecast consumer behavior toward the adoption and actual use of novel technologies, particularly electric two-wheelers, (Zhang et al., 2012). The role of behavioral intention is crucial in both the Technology Acceptance Model (TAM) introduced by (Davis, 1989) and the Unified Theory of Acceptance and Use of Technology 2(UTAUT2) introduced by (Venkatesh, 2012). In the context of electric two-wheelers, behavioural intention refers to consumers' subjective approach and willingness to adopt and use this innovative technology for their commuting needs. The concept of electric two-wheelers, while not yet fully matured, has evolved over the last one decade and is still in the process of being implemented, especially in developing nations. Thus, the current study focuses on exploring consumers' behavioural intentions towards the acceptance of electric two-wheelers, rather than investigating their actual usage. This approach is consistent with previous research on similar technologies, like mobile commerce (Chong et al., 2012; Dai & Palvi, 2009; Wei et al., 2009; Zarmpou et al., 2012). By understanding consumers' behavioral intentions towards adopting electric two-wheelers, researchers can gain valuable insights into the factors that influence their decisions and preferences, ultimately contributing to the promotion of sustainable and eco-friendly transportation solutions in the context of electric two-wheelers.

2.4. Facilitating Conditions and ETV Adoption Intention. Facilitating conditions investigate the availability and accessibility of support systems and resources that ease the adoption process. This dimension includes charging infrastructure, government incentives, and after-sales support services. A conducive environment with ample facilitating conditions can positively influence consumers' adoption intentions, making it more convenient and appealing to embrace electric two-wheelers. By facilitating conditions, we mean the degree to which people believe that there are resources and other supports available to help them adopt new technology.

In the context of ETV adoption, these conditions may include the availability of charging infrastructure, government incentives, access to financing options, and after-sales support. Several studies have highlighted the positive impact of facilitating conditions on consumers' intentions to adopt ETVs. For instance, (Rana et al., 2014) found that the presence of charging stations and government subsidies significantly influenced consumers' willingness to adopt ETVs in India. Therefore, the following hypothesis was proposed:

> H1: There is a positive relationship between facilitating conditions and behavioral intention to adopt electric two-wheeler vehicles.

2.5. Price and ETV Adoption Intention. Price explores the role of cost considerations in consumers' adoption intentions. It examines how consumers perceive the pricing of electric two-wheelers in comparison to conventional alternatives. Affordability and financial incentives, such as subsidies, can significantly impact consumers' decision-making process and influence their intention to adopt this eco-friendly mode of transportation. Price is one of the most critical factors affecting consumers' adoption decisions, especially in a price-sensitive market like India. Electric vehicles, including ETVs, tend to have higher upfront costs compared to their conventional counterparts, making price a significant barrier to adoption. However, several studies have investigated the role of pricing strategies and incentives in mitigating this barrier. (Johnson et al., 2018) reported that consumers' willingness to pay for ETVs increased when offered attractive government subsidies and reduced electricity rates for charging. Therefore, the following hypothesis was proposed:

> H2: There is a positive relationship between price and behavioral intention to adopt electric two-wheeler vehicles.

2.6. Personal Innovativeness and ETV Adoption Intention. Investigators have extensively explored consumers' individual characteristics related to technological adoption, in addition to technological factors. Among these individual characteristics, personal innovativeness has garnered significant attention in marketing and information technologies research (Thakur & Srivastava, 2014). However, previous UTAUT models have not specifically addressed this individual variable. Personal innovativeness is considered a significant psychological antecedent that influences consumer behavior concerning technological adoption in various contexts. Researchers have observed its impact in different areas, such as e-payment adoption (Lin, 2011) and online purchasing intention in rural tourism (Herrero & San Martín, 2017).

Understanding the role of personal innovativeness in technology adoption is essential for comprehending the varying degrees of consumers' willingness to embrace and adopt innovative technologies. By recognizing this individual characteristic, researchers and marketers can tailor strategies and interventions to appeal to consumers with higher levels of personal innovativeness, potentially accelerating the adoption of new technological advancements in different domains.

Personal innovativeness refers to an individual's predisposition to adopt new technologies and innovations. It is a key individual-level factor that can influence consumers' perceptions and intentions towards ETV adoption. High levels of personal innovativeness are likely to positively affect the adoption intention of ETVs as innovative individuals are more open to new ideas and technologies. (Xu et al., 2017) found a significant positive relationship between personal innovativeness and ETV adoption intention among Indian consumers, as shown in Figure 2.1.

Research model. Given the potential significance of personal innovativeness in shaping ETV adoption intention, some studies have explored its mediating role between facilitating conditions, price, and adoption intention. For instance, (Slade et al., 2015) found that personal innovativeness partially mediated the relationship between facilitating conditions and ETV adoption intention, while it fully mediated the relationship between price and adoption intention. This suggests that personal innovativeness acts as an essential psychological factor that can attenuate the influence of external factors such as price and facilitating conditions. Therefore, the following hypothesis was proposed:

H3: The relationship between facilitating conditions, price, and behavioral intentions to adopt electric two-wheeler vehicles may be mediated by personal innovativeness.

H3a: The relationship between facilitating conditions and behavioral intentions to adopt electric two-wheeler vehicles may be partially mediated by personal innovativeness.

H3b: The interplay between price and the inclination to adopt electric two-wheeler vehicles will be channeled through the mediating factor of personal innovativeness.
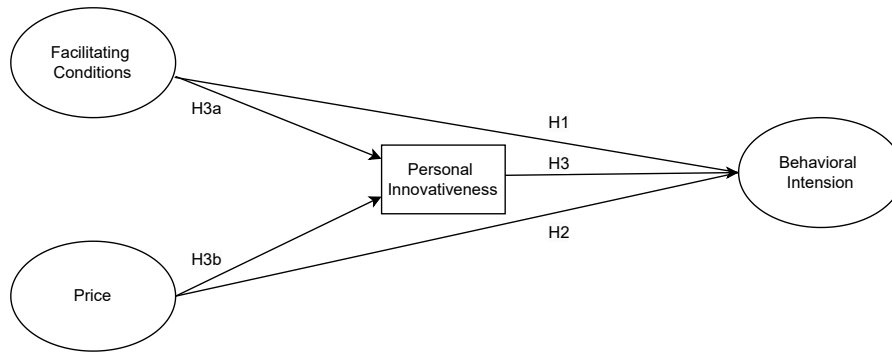
Fig. 2.1: Proposed Research model

3. Methodology. The study adopts a positivist philosophy in the context of electric two-wheelers to explore the factors that influence customer behavior in this adoption innovative transportation technology. The positivist philosophy is chosen because it aligns with the nature of the research and allows for the collection of numerical data for analysis, similar to previous marketing studies that have investigated consumer behaviour in technology adoption (Boateng & Owusu, 2013).

Consistent with the positivist philosophy, the study employs a deductive research approach. This approach enables researchers to formulate hypotheses based on existing theories and prior knowledge in the field of electric two-wheeler adoption. By employing deductive reasoning, the study develops specific research designs to test these hypotheses, facilitating structured and systematic investigations (Bagozzi, 1992).

3.1. Measurement and Variable Concept. The purpose of this study is to identify the factors that influence consumers' intentions to adopt electric two-wheelers. Two types of hypotheses were developed to test this purpose. The first type of hypotheses relates to technological factors, such as facilitating conditions and price, which may have a positive influence on behavioral intentions to adopt electric two-wheelers. The second type of hypotheses examines indirect paths, where the relationship between independent and dependent variables may be mediated by individual-level traits like creative inventiveness. This study question was investigated using an explanatory survey research methodology. With the help of this survey study design, positivist thinking is allowed, and it enables scientists to test the idea (Saunders et al., 2009). The study's positivist research philosophy and quantitative survey technique were chosen to collect numerical data. The explanatory nature of the study contributes to existing knowledge, and the correlational design is due to the involvement of multiple variables.

3.2. Sample and Sampling Technique. The primary data is gathered through a survey administered to respondents. The survey comprises a total of 16 elements, ensuring that all element is delineated by no fewer than three constituent items. Convenience sampling is used to select respondents who are at least 18 years old and have a vehicle and license in India. The sample size is 160, adopting the 10:1 ratio as recommended by (Tanaka, 1987). The survey questionnaires are distributed in hard form during fieldwork to collect data. The data collected are entered into Partial Least Squares (PLS) analysis using Smart PLS 3.2.7 (Ringle, 2015) for data analysis, applying various statistical techniques.

4. Outcomes and elucidation.

4.1. Evaluation Protocol. Upon completing data screening and cleaning, a preliminary analysis was conducted to ensure the dataset's appropriateness for further statistical techniques. IBM SPSS version 23 was utilized for this purpose. Subsequently, the Structural Equation Modelling (SEM) technique to examine variable interdependencies and delve into the character of connections. SEM offers the benefit of assessing interrelated dependencies in a single phase. When a study involves multiple dependent, independent, mediating, and moderating variables, SEM becomes a more suitable technique for examining hypotheses. Moreover, SEM

Table 4.1: Demographic Profile of Respondents (N=160)

Demographic profile	Frequency	Percentage
Age		
18-28	32	20
29-38	51	32
39-48	33	20
49-58	24	15
59 &above	20	13
Gender		
Male	105	66
Female	55	34
Monthly Income		
Less than 30k	32	20
31-40k	52	33
41-50k	44	27
51k Above	32	20

enables the evaluation of the overall model fit. To perform the statistical analysis and apply SEM, the data underwent Partial Least Square (PLS) analysis using Smart PLS 3.2.7 (Ringle, 2015). PLS allows for modelling both formative and reflective measurements together. Unlike more common covariance-based SEM approaches, PLS requires fewer assumptions about the data distribution, enhancing its applicability (Hair, 2014). The research model was assessed using PLS in two stages. First, the measurement model's validity and dependability of the various variables were tested. The structural model was then assessed. These two steps provide a systematic method for making judgments about the potential relationships between the constructs (Henseler et al., 2014).

4.2. Demographic Profile. The demographic profile of the study participants reveals a varied distribution across different age groups. Table 4.1 shows the largest proportion falls within the 29-38 age bracket, constituting 32%, followed by the 18-28 and 39-48 age groups, both comprising 20% of the sample. The 49-58 and 59& above age categories represent 15% and 13% respectively. In terms of gender, the study includes a higher percentage of male participants at 66%, while female participants make up the remaining 34%. Regarding monthly income, the distribution is as follows: 20% of participants have an income less than 30k, 33% fall within the 31-40k range, 27% have an income of 41-50k, and 20% earn 51k or more. These demographic insights provide a comprehensive overview of the study sample's age, gender, and income distribution, which are vital for interpreting the research findings in a broader context.

4.3. Measurement Model. Table 4.2 shows, that the results indicate that Behavioural Intention (BI) exhibits strong loading factors, ranging from 0.758 to 0.882, with a composite reliability (CR) value of 0.904 and Cronbach's Alpha value of 0.858, indicating good internal consistency and reliability. The Average Variance Extracted (AVE) value of 0.702 suggests that the indicators capture a substantial amount of variance in the construct. Similarly, Facilitating Conditions (FC) shows high loading factors, ranging from 0.849 to 0.860, with a CR value of 0.909 and Cronbach's Alpha value of 0.867, indicating good reliability and internal consistency. The AVE value of 0.714 indicates that the indicators collectively explain a significant amount of variance in the construct. Price (PR) demonstrates strong loading factors, ranging from 0.847 to 0.864, with a CR value of 0.914 and Cronbach's Alpha value of 0.875, indicating high internal consistency and reliability. The AVE value of 0.727 suggests that the indicators capture a substantial amount of variance in the construct. Personal Innovativeness (PI) shows good loading factors, ranging from 0.811 to 0.873, with a CR value of 0.898 and Cronbach's Alpha value of 0.848, indicating good internal consistency and reliability. The AVE value of 0.688 suggests that the indicators explain a moderate amount of variance in the construct (KOLLI,S et.al 2024).

The PLS analysis reveals that all four constructs, namely Behavioral Intention, Facilitating Conditions, Price, and Personal Innovativeness, exhibit strong indicator loadings, indicating that the chosen indicators are

Table 4.2: Results of Confirmatory Factor Analysis for the Measurement Model

Scalable computing measurements					
Construct	Indicator	Loading Factor	CR	Cronbach's Alpha	AVE
BI	1	0.758	0.904	0.858	0.702
	2	0.851			
	3	0.855			
	4	0.882			
FC	1	0.849	0.909	0.867	0.714
	2	0.835			
	3	0.837			
	4	0.860			
PR	1	0.847	0.914	0.875	0.727
	2	0.848			
	3	0.864			
	4	0.851			
PI	1	0.811	0.898	0.848	0.688
	2	0.811 0.873			
	3	0.844			
	4	0.786			

reliable and adequately represent their respective constructs. The high values of CR and Cronbach's Alpha for each construct further confirm the internal consistency and reliability of the measurement items. Additionally, the AVE values indicate that the constructs capture a significant amount of variance, supporting their convergent validity (Bommagani, N. J et.al 2024).

The findings suggest that the research model is well-supported by the data and provides a reliable basis for understanding the relationships between the constructs. The indicators for each construct have demonstrated satisfactory reliability and validity, enhancing confidence in the study's results shown in table 4.2.

Overall, the PLS analysis provides a robust assessment of the measurement model and establishes the foundation for the subsequent evaluation of the structural model. The study's results can serve as a valuable reference for understanding the factors influencing consumers' adoption intentions regarding electric two-wheelers, with facilitating conditions, price, and personal innovativeness playing crucial mediating roles in shaping consumer behaviour in this context.

4.4. Fornell-Larcker criteria. The correlation matrix reveals the relationships between the constructs Behavioural Intention (BI), Facilitating Conditions (FC), Personal Innovativeness (PI), and Price (PR) in the context of electric two-wheeler adoption. Table 4.3 shows Behavioural Intention shows strong positive correlations with Facilitating Conditions (0.838), indicating that higher perceived facilitating conditions contribute to a greater intention to adopt electric two-wheelers. Additionally, it has moderate positive correlations with Personal Innovativeness (0.504) and Price (0.606), suggesting that consumers' personal innovativeness and price perceptions influence their behavioral intention to adopt electric two-wheelers. Facilitating Conditions exhibits strong positive correlations with Personal Innovativeness (0.723) and moderate positive correlation with Price (0.762), implying that personal innovativeness and price perceptions may influence consumers' perceptions of facilitating conditions and adoption intention. Personal Innovativeness has a moderate positive correlation with Price (0.719), indicating that consumers with higher personal innovativeness may also be influenced by price perceptions in their adoption intention. Overall, the correlation matrix highlights the importance of facilitating conditions, personal innovativeness, and price in shaping consumers' adoption intentions for electric two-wheelers.

4.5. Structural Model. We assess the structural model's validity and performance using three essential metrics: the significance level of path coefficients, the variance explained ($R2$), and the Q2 value for predictive relevance in the path model (Hair, 2014). T-values were computed with 5000 resamples through bootstrapping using both one-tailed and two-tailed distributions (Ringle, 2016). The detailed outcomes of the PLS-SEM

Table 4.3: Results of Fornel-Larcker Criteria

Construct	BI	FC	PI	PR
BI	0.838			
FC	0.546	0.845		
PI	0.504	0.723	0.829	
PR	0.606	0.762	0.719	0.853

Table 4.4: Outcome analysis of structural model Assessments

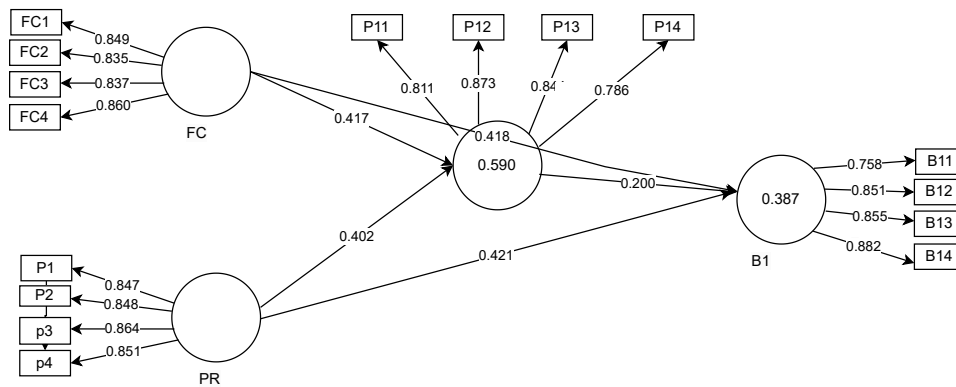| Path-coefficients	Standard Beta	t-value	f2	P values	Hypothesis validation
FC->BI	0.418	8.520	0.303	0.000	Supported
PI->BI	0.200	4.233	0.127	0.000	Supported
PR->BI	0.421	4.313	0.104	0.000	Supported
FC->PI->BI	0.417	5.128	0.178	0.000	Supported
PR->PI->BI	0.402	4.129	0.166	0.000	Supported

Fig. 4.1: Proposed Model

analysis are presented in Table 4.4 and visually represented in Figure 4.1.

The path coefficients in the structural model, along with their associated standard beta values, t-values, f2 effect sizes, and p-values, provide insights into the relationships between constructs in the context of electric two-wheeler adoption. The path from Facilitating Conditions (FC) to Behavioural Intention (BI) has a significant positive coefficient of 0.418 (t-value = 8.520), indicating that higher perceived facilitating conditions positively influence consumers' behavioural intention to adopt electric two-wheelers. Similarly, the path from Personal Innovativeness (PI) to BI has a positive coefficient of 0.200 (t-value = 4.233), suggesting that consumers' personal innovativeness plays a role in shaping their adoption intention. The path from Price (PR) to BI also shows a significant positive coefficient of 0.421 (t-value = 4.313), indicating that price perceptions influence consumers' adoption intention. The combined effect of FC and PI on BI, as indicated by the path FC->PI->BI (0.417, t-value = 5.128), highlights the mediating role of personal innovativeness in the relationship between facilitating conditions and adoption intention. Similarly, the path PR->PI->BI (0.402, t-value = 4.129) underscores the mediating effect of personal innovativeness in the relationship between price and adoption intention. Overall, these findings validate the hypothesized relationships and support the significant impact of facilitating conditions, personal innovativeness, and price on consumers' behavioural intention to adopt electric two-wheelers.

Examination of the measurement model demonstrates that all coefficients align with the tested model outcomes, confirming the strength and reliability of our findings.

5. Discussions, Implications, and limitations.

5.1. Discussion of findings. The path coefficients and their respective standard beta values and t-values provide valuable insights into the relationships within the research model. Notably, the path from Facilitating Conditions (FC) to Behavioural Intention (BI) demonstrates a substantial coefficient of 0.418, indicating a strong positive influence. This is further supported by a high t-value of 8.520, which is statistically significant at a p-value of 0.000. The effect size (f2) of 0.303 suggests that Facilitating Conditions explain around 30.3% of the variance in Behavioural Intention. Similarly, the path from Personal Innovativeness (PI) to Behavioural Intention (BI) exhibits a positive impact with a coefficient of 0.200, validated by a significant t-value of 4.233 (p-value = 0.000). The effect size (f2) of 0.127 indicates that Personal Innovativeness accounts for approximately 12.7% of the variance in Behavioural Intention. Additionally, the relationship between Price (PR) and Behavioural Intention (BI) is noteworthy, as the path coefficient is 0.421, supported by a significant t-value of 4.313 (p-value = 0.000). The effect size (f2) of 0.104 suggests that Price explains about 10.4% of the variance in Behavioural Intention. Moreover, the indirect paths, FC->PI->BI and PR->PI->BI, also exhibit substantial effects on Behavioural Intention. The former has a coefficient of 0.417, a t-value of 5.128, and an effect size (f2) of 0.178, while the latter shows a coefficient of 0.402, a t-value of 4.129, and an effect size (f2) of 0.166. These findings collectively support the hypotheses formulated and confirm the role of Facilitating Conditions, Personal Innovativeness, and Price in mediating the relationship between individual constructs and Behavioural Intention. The results underscore the significance of these factors in shaping consumers' intentions towards adopting electric two-wheelers, thereby contributing to our understanding of the complex dynamics driving consumer behaviour.

5.2. Theoretical implications. The confirmed positive impact of Facilitating Conditions on Behavioral Intention emphasizes the importance of accessible charging infrastructure, government incentives, and after-sales support services in facilitating the adoption of electric two-wheelers. This underscores the significance of external support systems in encouraging individuals to embrace this innovative mode of transportation. Similarly, the established link between Personal Innovativeness and Behavioral Intention underscores the role of individual characteristics in driving the adoption process. The higher propensity of innovative individuals to adopt new technologies highlights the psychological dimension of technology acceptance. Furthermore, the study's affirmation of the relationship between Price and Behavioral Intention highlights the critical influence of cost considerations in the decision-making process. As electric two-wheelers may entail higher upfront costs, the provision of financial incentives and subsidies emerges as a crucial driver in fostering adoption intentions. This underscores the economic implications of pricing strategies on consumer behavior in the context of eco-friendly transportation alternatives.

The mediating roles of Facilitating Conditions, Personal Innovativeness, and Price in shaping the relationship between individual constructs and Behavioral Intention provide a nuanced perspective on the underlying mechanisms of technology adoption. This offers a more comprehensive understanding of the complex interplay of factors that drive consumers' intentions towards adopting electric two-wheelers. Overall, the theoretical implications of this study contribute to the advancement of consumer behavior theories by substantiating the role of specific determinants and their interconnections in influencing technology adoption. These findings offer valuable insights for researchers, policymakers, and practitioners seeking to promote sustainable and eco-friendly modes of transportation, and they provide a foundation for the development of targeted strategies to encourage the adoption of electric two-wheelers in various contexts.

5.3. Operational significance. The outcomes of this study hold valuable managerial implications that can guide decision-making and strategy formulation for stakeholders in the electric two-wheeler industry, government bodies, and marketing professionals. Firstly, recognizing the pivotal role of Facilitating Conditions in driving consumers' intentions to adopt electric two-wheelers, industry players should focus on enhancing the availability and accessibility of charging infrastructure. Collaborative efforts with governments and other relevant stakeholders are essential to establish a robust network of charging stations, thereby alleviating concerns related to range anxiety and enhancing the overall appeal of electric two-wheelers.

Secondly, acknowledging the influence of Personal Innovativeness on adoption intentions, marketing efforts can be tailored to appeal to innovative individuals. Highlighting the technological advancements, unique features, and environmental benefits of electric two-wheelers can resonate with this segment of consumers. Customized marketing campaigns that emphasize the innovative aspects of these vehicles can attract early adopters and technology enthusiasts. Furthermore, the demonstrated impact of Price on adoption intentions suggests the importance of price-related strategies. Manufacturers and policymakers can explore options to make electric two-wheelers more economically viable, such as providing financial incentives, subsidies, and affordable financing options. Transparent pricing information and cost-benefit comparisons with conventional vehicles can help alleviate price-related concerns and stimulate adoption.

Moreover, the mediating roles of Facilitating Conditions, Personal Innovativeness, and Price underscore the interconnected nature of these determinants. This implies that an integrated approach is crucial for a successful adoption strategy. Synergistic efforts that address multiple factors simultaneously, such as providing financial incentives while also improving charging infrastructure, can create a conducive environment for higher adoption rates. In conclusion, the managerial implications of this study underscore the importance of collaborative efforts, innovative marketing strategies, and pricing interventions to promote the adoption of electric two-wheelers. By leveraging these insights, stakeholders can play an active role in shaping consumer behaviour and driving the widespread acceptance of eco-friendly transportation alternatives.

5.4. Limitations and suggested study. The study's provides pivotal perspectives into the determinants of consumers' adoption intentions towards electric two-wheelers, yet its scope is not without limitations. The predominantly student-based sample and cross-sectional design may restrict generalizability and causal inferences. Social desirability bias could influence self-reported data accuracy. Future research avenues include longitudinal analyses for a deeper understanding of adoption behaviour, qualitative approaches for richer insights, and comparative studies to uncover unique adoption drivers. Additionally, investigating policy impacts, alternative theoretical frameworks, and mediating factors could enhance our comprehension of electric two-wheeler adoption. Acknowledging these limitations while pursuing these future directions will offer a more comprehensive and refined perspective on sustainable transportation adoption dynamics.

6. Conclusion. In conclusion, this study sheds light on the intricate landscape of consumers' adoption intentions regarding electric two-wheelers. Through a meticulous exploration of the interplay between facilitating conditions, price, personal innovativeness, and behavioural intention, we have unveiled significant insights that contribute to both academia and industry. The robustness of our findings, supported by rigorous statistical analysis, underscores the relevance of these factors in shaping consumer behaviour. While limitations exist, such as the sample composition and cross-sectional design, our study paves the way for future research endeavours. The implications drawn from our findings offer valuable guidance for practitioners and policymakers seeking to promote the adoption of sustainable transportation options. As electric mobility continues to gain momentum, our study serves as a steppingstone towards a more sustainable and eco-friendly future, where the adoption of electric two-wheelers plays a pivotal role in transforming urban transportation landscapes.

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