

The Impact of Perceived Risk and Trust on Electric Vehicle Adoption in Sustainable Tourism Regions

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The influence of perceived risk and marketing communication on electric motorcycle purchase choices in Bali is examined in this study, with technological trust serving as the mediating factor. Despite Bali's global acclaim as an eco-tourism hub dedicated to sustainable progress, electric vehicle uptake among residents lags behind official benchmarks. A quantitative survey methodology is employed, drawing data from local inhabitants and subjecting it to Partial Least Squares–Structural Equation Modeling (PLS-SEM) grounded in the Unified Theory of Acceptance and Use of Technology (UTAUT 3). Significant direct and indirect effects on purchase determinations channeled through trust in technology are revealed for both perceived risk and marketing communication. A pivotal mediation function is fulfilled by technological trust, whereby the adverse sway of perceived risk is attenuated and the favorable impact of marketing outreach amplified. Transparent, educational, and confidence-enhancing promotional tactics, coupled with enabling infrastructure and regulatory measures, are underscored by the outcomes as vital for hastening electric vehicle integration in tourism-centric sustainable locales.

Keywords: Electric Vehicles, Marketing Communication, Perceived Risk, Purchase Decision, Sustainable Tourism, Trust in Technology, UTAUT 3

INTRODUCTION

Carbon emissions are being reduced and climate change mitigation has become a global priority for governments and industries through the transition toward sustainable transportation. The transportation sector is being decarbonized primarily through the adoption of electric vehicles (EVs), which are widely recognized for their lower greenhouse gas emissions and reduced dependence on fossil fuels. In Indonesia, EV adoption is being accelerated by the government through various incentives and regulatory measures, including subsidies and infrastructure development initiatives (Agus, 2024). Despite these efforts, actual adoption rates for electric motorcycles and cars have only slightly exceeded national targets, indicating the presence of perceptual and behavioral barriers among consumers (Kurniawan & Ferdian, 2024).

A distinctive context for examining EV adoption is provided by Bali, which is globally recognized as a center for sustainable tourism and is actively promoted as a region committed to environmentally conscious development (Astuti et al., 2024). Green tourism concepts and indigenous values emphasizing ecological balance have been integrated into Bali's provincial development plans (Shalomita & Suryawan, 2024; Widhiasthini et al., 2025). Consequently, this strategic alignment is expected to foster greater receptivity toward eco-friendly innovations, including electric motorcycles. Nevertheless, current market penetration among local residents reveals a gap between sustainability promotion and actual purchasing decisions, highlighting the need for a comprehensive analysis of the factors influencing EV acceptance in the region.

The adoption of emerging technologies can be theoretically explained through the Unified Theory of Acceptance and Use of Technology (UTAUT 3), which suggests that behavioral intention and actual usage are shaped by factors such as social influence, facilitating conditions, and personal innovativeness (Venkatesh et al., 2003; Venkatesh et al., 2012). In the context of electric vehicles, consumer evaluations may also be influenced by important external variables, including perceived risk and marketing communication. Perceived risk, which encompasses concerns regarding battery durability, charging infrastructure, and maintenance costs, may discourage purchase intentions (Featherman et al., 2021; Wu et al., 2023). Conversely, effective marketing communication can reduce uncertainty by providing transparent information, endorsements, and demonstrations of technological reliability (Ikhsan et al., 2024; Irma & M. Abrar, 2025).

Trust in technology plays a crucial mediating role within this relationship. Consumers' confidence in the reliability, safety, and effectiveness of EV systems can strengthen acceptance by reducing the negative influence of perceived risk while enhancing the positive impact of marketing communication (Amirudin et al., 2025; Eccarius & Chen, 2024). Therefore, this study investigates the direct and indirect effects of perceived risk and marketing communication on purchase intention, with trust in technology serving as the mediating variable. By focusing on the local community in Bali, this research contributes to the literature on sustainable technology adoption while also providing practical insights for policymakers and EV industry stakeholders seeking to accelerate EV integration in tourism-oriented sustainable regions.

LITERATURE REVIEW

Unified Theory of Acceptance and Use of Technology 3 (UTAUT 3)

The Unified Theory of Acceptance and Use of Technology (UTAUT 3) is recognized as an advanced extension of the original UTAUT model proposed by Venkatesh et al. (2003) and later expanded into UTAUT2 by Venkatesh et al. (2012). UTAUT 3 was

further developed by [Venkatesh et al. \(2012\)](#), emphasizing the role of trust and perceived risk in shaping intentions toward emerging technologies. The framework incorporates constructs such as performance expectancy, effort expectancy, social influence, hedonic motivation, habit, facilitating conditions, personal innovativeness, price value, behavioral intention, and actual use. Behavioral intention primarily mediates the relationship between these factors and actual technology use. In the present study, only the constructs considered most relevant to electric motorcycle adoption namely personal innovativeness, social influence, and facilitating conditions are employed.

Personal innovativeness reflects an individual's willingness to adopt new technologies and innovations. Individuals with higher levels of innovativeness tend to exhibit greater tolerance for risk and are generally more receptive to messages emphasizing technological advancement ([Khazaei & Tareq, 2021](#); [Nagata & Tommy, 2024](#)). Furthermore, personal innovativeness has been found to strengthen purchase intention toward technological products, including electric vehicles ([Ivanova & Moreira, 2023](#)). Social influence refers to the extent to which technology adoption decisions are affected by social expectations and support from individuals within one's environment. In the context of electric vehicles, adoption intentions have been shown to be influenced by family members, peers, social groups, and influential role models, although the strength of this influence may vary across settings ([Selvi & Önem, 2025](#)). Facilitating conditions refer to the availability of resources such as infrastructure, technical support, and government policies that enable consumers to use technology effectively. In the electric vehicle context, the readiness of charging infrastructure, after-sales support, and regulatory frameworks is considered essential in encouraging actual usage ([Cahya & Sukresna, 2022](#)).

Purchase decision, or purchase intention, refers to a consumer's willingness, plan, or tendency to purchase a product or service in the future, driven by both internal motivations and external stimuli ([Annisa & Mirzam, 2024](#)). It represents a psychological stage closely associated with actual consumer behavior and is influenced by attitudes toward products, perceived value, and social as well as emotional pressures. Within the broader decision-making process, purchase decision reflects consumers' readiness to engage in transactions based on prior experiences and situational influences ([Anggara & Hapsoro, 2025](#)). Consumers are more likely to make purchases when they perceive higher benefits and greater value. Moreover, purchase decision serves as an important predictor of consumer behavior and a significant indicator of marketing effectiveness ([Fahrizal & Maharani, 2025](#)). Empirical studies in the context of electric vehicles demonstrate that purchase intention is positively influenced by personal innovativeness. Consumers with higher innovativeness generally display more favorable attitudes and stronger intentions toward adopting new technologies due to their interest in unique technological experiences and functional benefits ([Featherman et al., 2021](#)).

Perceived Risk

Perceived risk refers to the degree of uncertainty associated with potential outcomes during the purchasing process. It is influenced by personal characteristics, product attributes, situational factors, and cultural dynamics, thereby significantly affecting consumer purchasing behavior ([Ma et al., 2025](#)). In the context of electric vehicles (EVs), perceived risk reflects consumers' evaluations of performance, financial, and safety aspects, including driving range, charging duration, and maintenance costs ([Featherman et al., 2021](#)). Perceived risk is conceptualized as the interaction between expected outcomes and the level of uncertainty considered during decision-making. According to [Schiffman \(2008\)](#), consumers evaluate potential consequences associated with purchasing and using products, which encourages them to seek relevant information to increase confidence and improve decision quality.

Marketing Communication

Marketing communication refers to a series of communication activities designed to convey messages to target audiences in order to achieve organizational objectives and influence consumer behavior (Kansa & Wiryany, 2024). This integrated approach combines various strategies and tools to ensure effective message delivery while maintaining competitive advantage. In the context of electric vehicles, marketing communication addresses issues such as battery disposal, technological durability, and environmental benefits. Companies frequently utilize integrated campaigns, interactive experiences, and event-based promotions to increase consumer engagement. Effective communication strategies can stimulate consumer discussions and social interactions, thereby strengthening technology adoption. Engaging digital content also enhances brand visibility and fosters positive social perceptions regarding EV adoption. Furthermore, personalized and experience-based strategies can increase consumer interest and encourage personal innovativeness, which has been shown to strengthen intentions to purchase EVs (Sanjaya & Efrata, 2024). Marketing communication also reinforces social influence by increasing public exposure and shaping more favorable collective perceptions of electric vehicles (Rosalia, 2025).

Trust in Technology

Trust in technology refers to an individual's belief that technology is reliable, secure, and capable of meeting user expectations, thereby strengthening consumer confidence in adopting new innovations (Tarigan et al., 2025). In the context of electric vehicles, trust in technology has been found to significantly mediate the relationship between marketing communication and purchase decisions in Indonesia (Solekah et al., 2023). Concerns related to privacy and cybersecurity in modern vehicles also influence consumer trust and subsequently affect purchase decisions (Hironimus & Ahmad, 2025). Trust is considered a fundamental factor underlying consumer decision-making and loyalty formation in digital environments, and it remains a major driver of EV purchase decisions despite the existence of perceived risks. Trust in technology also strengthens personal innovativeness and social influence, as consumers who perceive EV technology as reliable and secure tend to be more open to experimentation and are more likely to encourage adoption within their social circles. Positive experiences and confidence in technology further create supportive social norms regarding EV adoption, positioning trust as a form of social validation that enhances purchase intention and consumer perception (Wijayadne, 2025).

Hypotheses Development

The Effect of Perceived Risk on Purchase Decision

Within the Unified Theory of Acceptance and Use of Technology framework proposed by Venkatesh et al. (2003), technology acceptance is influenced by factors such as personal innovativeness, social influence, and facilitating conditions. In the Indonesian electric vehicle context, concerns regarding battery performance, driving range, and the availability of public charging stations (SPKLU) are closely associated with facilitating conditions because they shape consumers' perceptions regarding ease of use and perceived benefits. However, perceived risk does not always negatively affect purchase intention. Consumers with high technological literacy may perceive risks as indicators of innovation and environmental commitment (Kottala et al., 2025). According to Schiffman (2008), consumers consider financial, functional, physical, social, and psychological risks during the decision-making process. Studies conducted by Saputra and Andajani (2023) in Surabaya and Lashari et al. (2021) indicate that consumers who are confident in managing risks tend to maintain strong purchase intentions. Conversely, lower perceived risk has also been found to accelerate and strengthen purchase decisions (Handoyo, 2024), particularly when innovation is rationally understood and considered

reasonable by consumers (Zhang et al., 2024). Therefore, perceived risk in this study is positioned as a dynamic factor capable of influencing electric vehicle purchase decisions through both individual readiness and environmental support. Thus, the following hypothesis is proposed:

H1: Perceived risk has a positive effect on vehicle purchase decisions.

The Effect of Marketing Communication on Purchase Decisions

Within the UTAUT framework developed by Venkatesh et al. (2003), marketing communication acts as an external factor that strengthens social influence and facilitating conditions through the dissemination of information, education, and testimonials that shape expectations and social support for new technology adoption. Effective communication helps consumers understand the benefits of electric vehicles, including efficiency, environmental sustainability, operational cost savings, warranties, and after-sales services, thereby increasing confidence in the product's ability to deliver promised benefits. This phenomenon is evident in digital advertising strategies and social media campaigns emphasizing environmental advantages and energy efficiency, particularly in Indonesia, where challenges related to limited public literacy and charging infrastructure concerns remain significant (Lazuardy et al., 2025). Several studies indicate that informative and persuasive marketing communication positively affects trust and purchase decisions (Azzahra et al., 2025; Banerjee et al., 2026; Guo & Jiang, 2024), although its effectiveness may decline when consumers experience advertising fatigue due to excessive exposure (Guo & Jiang, 2024). Furthermore, messages emphasizing objective benefits and sustainability have been shown to strengthen consumer orientation toward EV purchases. Therefore, more effective marketing communication is expected to exert a stronger influence on electric vehicle purchase decisions. Thus, the following hypothesis is proposed:

H2: Marketing communication has a positive effect on vehicle purchase decisions.

The Effect of Perceived Risk on Trust in Technology

Within the UTAUT framework, trust in technology is considered a central factor influencing behavioral intention and technology use, particularly through users' perceived risks and personal innovativeness. Consumers' trust in electric vehicle systems may be affected by concerns regarding technical failures, security, reliability, battery degradation, and charging infrastructure limitations, which ultimately influence their willingness to adopt EV technology (Masrek et al., 2025). These concerns are reflected in issues related to safety, operational reliability, data security, maintenance costs, and battery durability in the context of electric and autonomous vehicle development (Rezki Ian et al., 2025). Consequently, trust in manufacturers, technological systems, and government regulations becomes essential in fostering consumer confidence. Several studies emphasize that higher perceived risk is associated with lower trust levels (Azzahra et al., 2025), whereas the ability to reduce perceived risk can strengthen trust in new technologies (Faujiyah et al., 2025). Findings by Dang and Erorita (2025) also demonstrate that perceived risk affects dimensions of competence, benevolence, and integrity in intelligent vehicle technology. Therefore, effective risk management becomes a strategic factor in strengthening trust and encouraging electric vehicle adoption. Thus, the following hypothesis is proposed:

H3: Perceived risk has a positive effect on trust in technology.

The Effect of Marketing Communication on Trust in Technology

Within the UTAUT framework proposed by Venkatesh et al. (2003), technology acceptance is influenced by constructs such as personal innovativeness, social

influence, and facilitating conditions, with trust functioning as an essential psychological element in supporting EV adoption. Informative, transparent, and credible marketing communication reduces uncertainty and enhances consumer confidence in electric vehicle systems (Permana et al., 2023). Consistent and systematic communication can foster positive perceptions and strengthen consumer trust in products and technologies, as suggested by Kotler & Keller (2016). In response to consumer concerns regarding battery durability, cybersecurity, and charging infrastructure, EV companies build trust through awareness campaigns, performance demonstrations, battery warranties, safety certifications, third-party reviews, and product trial programs. Such efforts reinforce confidence in the reliability of EV technology and the adequacy of technical support and after-sales services. Transparent communication regarding environmental issues also increases trust in EV brands, while integrated marketing strategies directly influence purchase decisions. Interactive and informative social media communication has additionally been shown to strengthen brand trust, which mediates the relationship between marketing communication and EV purchase intention (Amirudin et al., 2025). Thus, the following hypothesis is proposed:

H4: Trust in technology is positively influenced by marketing communication.

The Effect of Trust in Technology on Purchase Decisions

Trust in technology represents a key factor within the UTAUT framework for explaining electric vehicle purchase decisions, as behavioral intention and technology use are influenced by personal innovativeness, social influence, and facilitating conditions. Trust strengthens consumers' confidence that EV systems are reliable, secure, effective, and supported by adequate after-sales service, thereby increasing the likelihood of purchase (Permana et al., 2023). In the electric motorcycle market, concerns regarding battery life, charging infrastructure, and system reliability may influence consumer decisions; however, trust can be strengthened through battery warranties, real-world testing evidence, and transparent information, which subsequently encourage purchases (Agustina et al., 2025). Trust also reduces uncertainty associated with unfamiliar technologies (Amirudin et al., 2025). Research in Indonesia further demonstrates that trust in products and service providers significantly increases purchase intention and decisions related to electric motorcycles (Agustina et al., 2025). Therefore, the following hypothesis is proposed:

H5: Trust in technology positively affects purchase decisions.

The Effect of Perceived Risk on Purchase Decisions Mediated by Trust in EV Technology

Within the UTAUT framework, trust in technology functions as an important mediating variable linking perceived risk and electric vehicle purchase decisions. Although technology adoption is influenced by personal innovativeness, social influence, and facilitating conditions, trust reinforces consumers' beliefs that EV systems are secure, reliable, and beneficial. When concerns related to battery durability, cybersecurity, charging infrastructure, or maintenance costs arise, trust in technology can reduce the negative impact of such perceived risks and support the development of purchase intention. This phenomenon is evident in Indonesia, where EV adoption continues to grow alongside increased technological awareness, transparent communication, and warranty support that strengthen consumer confidence. Empirical findings by Eccarius & Chen (2024) confirm the mediating role of trust in technology in the relationship between perceived risk and EV adoption intention. Similarly, Agustina et al. (2025) found that perceived trust mediates the relationship between perceived risk and electric motorcycle purchase decisions in Indonesia, while Ma et al. (2025) emphasized that trust acts as a major intermediary in transforming intention into actual behavior in the context of

technological innovation. Therefore, stronger trust in EV technology can reduce the influence of perceived risk and increase the likelihood of purchase. Thus, the following hypothesis is proposed:

H6: Trust in EV technology mediates the relationship between perceived risk and EV purchase decisions.

The Effect of Marketing Communication on EV Purchase Decisions Mediated by Trust in EV Technology

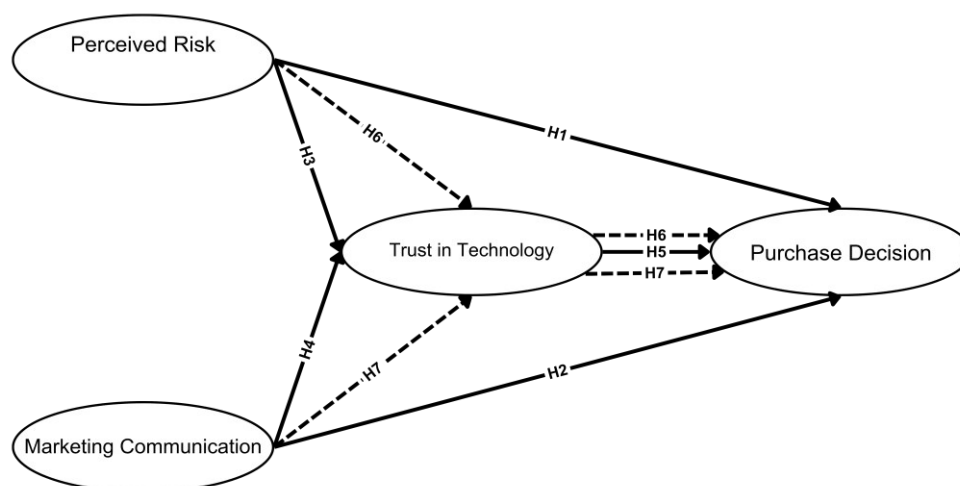
Within the UTAUT framework, marketing communication functions as a supporting and informational mechanism that influences personal innovativeness, social influence, and facilitating conditions related to new technologies. Informative, transparent, and credible communication can increase trust in technology, thereby reducing consumer concerns regarding technical and infrastructural risks associated with EVs and encouraging purchase decisions. This phenomenon is particularly evident in the electric motorcycle market, where consumers often hesitate due to concerns regarding battery durability, charging accessibility, and technological reliability. Marketing campaigns emphasizing performance evidence, battery warranties, user testimonials, and technical education have been successful in increasing trust and transforming hesitation into purchasing behavior. Effective marketing communication shapes positive consumer perceptions of EVs by delivering educational and persuasive messages that strengthen confidence in the reliability and benefits of EV technology. Once trust in EV technology is established, it becomes a stronger determinant of purchase decisions, positioning trust as a mediating variable between marketing communication and EV purchase decisions. Empirical studies support this relationship. Quantitative research has shown that media exposure and marketing campaigns increase EV adoption through enhanced public trust in the technology. Other studies demonstrate that green advertising emphasizing environmental benefits and practical value increases purchase intention, although its effectiveness depends on consumer trust in marketing claims (Bi et al., 2023). Furthermore, research examining social media marketing in the EV industry reveals that interactivity and informativeness significantly strengthen brand trust, which subsequently mediates the effect of marketing communication on purchase decisions. Therefore, the following hypothesis is proposed:

H7: Trust in EV technology mediates the effect of marketing communication on electric vehicle (EV) purchase decisions.

Conceptual Framework

The study framework model is depicted in [Figure 1](#).

Figure 1. Research Framework



RESEARCH METHOD

Sampling

This study employed a quantitative approach to examine the influence of perceived risk and marketing communication on electric vehicle (EV) purchase decisions, with trust in technology as a mediating variable. The research was conducted in Bali, Indonesia, considering Bali's role as a sustainable tourism destination actively promoting environmentally friendly transportation adoption. The target population consisted of Bali residents who were familiar with electric motorcycles or EV technology. The unit of analysis in this study was individual consumers.

Purposive sampling was applied to select respondents who met specific criteria, namely individuals aged at least 17 years old, residing in Bali, and having knowledge or awareness of electric motorcycles. The respondents consisted of potential consumers and individuals familiar with EV-related information and technology.

Data Collection

Primary data were collected through an online questionnaire distributed using Google Forms. The questionnaire employed a five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. Data collection was conducted by distributing the questionnaire through social media platforms and online communication channels to respondents who met the research criteria.

Measures

The measurement indicators in this study were adapted from previous research to ensure validity and reliability. Perceived risk was measured using indicators adapted from Featherman et al. (2021) and Ma et al. (2025), marketing communication was measured using indicators adapted from Kansa and Wiriany (2024) and Rosalia (2025), trust in technology was measured using indicators adapted from Tarigan et al. (2025) and Eccarius & Chen (2024), while purchase decision was measured using indicators adapted from Annisa and Mirzam (2024) and Agustina et al. (2025).

Data analysis was conducted using Partial Least Squares–Structural Equation Modeling (PLS-SEM) with SmartPLS 4.0 software. The analysis included outer model evaluation through convergent validity, discriminant validity, and reliability testing, as well as inner model evaluation through R-square, Q-square, F-square, and hypothesis testing using bootstrapping procedures. Hypotheses were accepted when the t-statistic exceeded 1.96 and the p-value was below 0.05 (Ghozali, 2021).

RESULTS

Convergent Validity

Convergent validity was assessed using outer loading and Average Variance Extracted (AVE) values. According to Ghozali (2021), indicators are considered valid when the outer loading values exceed 0.70 and the AVE values are above 0.50. The results indicate that all indicators satisfy these criteria. The outer loading values for Perceived Risk range from 0.779 to 0.863, Marketing Communication ranges from 0.795 to 0.834, Trust in Technology ranges from 0.853 to 0.870, and Purchase Decision ranges from 0.837 to 0.877. These findings confirm that all indicators adequately represent their respective constructs.

Furthermore, all AVE values exceed the recommended threshold of 0.50, indicating that each construct is capable of explaining more than half of the variance of its indicators. Therefore, the measurement model demonstrates satisfactory convergent validity and is appropriate for further analysis.

Table 1. Convergent Validity and Reliability Results

Variable	Outer Loading Range	AVE	Cronbach's Alpha	Composite Reliability
Perceived Risk	0.779 – 0.863	0.666	0.876	0.902
Marketing Communication	0.795 – 0.834	0.674	0.879	0.883
Trust in Technology	0.853 – 0.870	0.744	0.828	0.829
Purchase Decision	0.837 – 0.877	0.746	0.915	0.918

Source: Processed Data (2026)

Discriminant Validity

Discriminant validity was evaluated using cross-loading values and the Heterotrait-Monotrait Ratio (HTMT). The cross-loading results reveal that each indicator has a stronger correlation with its own construct compared to other constructs. Indicators of Perceived Risk demonstrate cross-loading values ranging from 0.779 to 0.863, which are higher than their correlations with other variables. Similarly, the indicators of Marketing Communication range from 0.795 to 0.834, Trust in Technology ranges from 0.853 to 0.870, and Purchase Decision ranges from 0.837 to 0.877. These findings confirm that all constructs possess adequate discriminant validity.

In addition, all HTMT values are below the recommended threshold value of 0.85. The HTMT value between Purchase Decision and Trust in Technology is 0.689, between Marketing Communication and Trust in Technology is 0.593, between Marketing Communication and Purchase Decision is 0.559, between Perceived Risk and Trust in Technology is 0.210, between Perceived Risk and Purchase Decision is 0.218, and between Perceived Risk and Marketing Communication is 0.085. These results indicate that all constructs are empirically distinct from one another and free from multicollinearity issues.

Table 2. HTMT Results

Variable Relationship	HTMT Value	Result
Purchase Decision ↔ Trust in Technology	0.689	Valid
Marketing Communication ↔ Trust in Technology	0.593	Valid
Marketing Communication ↔ Purchase Decision	0.559	Valid
Perceived Risk ↔ Trust in Technology	0.210	Valid
Perceived Risk ↔ Purchase Decision	0.218	Valid
Perceived Risk ↔ Marketing Communication	0.085	Valid

Source: Processed Data (2026)

Reliability

Reliability testing was conducted using Cronbach's Alpha and Composite Reliability values. A construct is considered reliable when both values exceed 0.70. The findings demonstrate that all variables satisfy the reliability criteria. Trust in Technology has a Cronbach's Alpha value of 0.828 and a Composite Reliability value of 0.829. Purchase Decision shows values of 0.915 and 0.918, respectively. Marketing Communication records values of 0.879 and 0.883, while Perceived Risk demonstrates values of 0.876 and 0.902. Therefore, all constructs used in this study are considered reliable and internally consistent.

Table 3. Reliability Results

Variable	Cronbach's Alpha	Composite Reliability	Explanation
Trust in Technology	0.828	0.829	Reliable
Purchase Decision	0.915	0.918	Reliable
Marketing Communication	0.879	0.883	Reliable
Perceived Risk	0.876	0.902	Reliable

Source: Processed Data (2026)

R-Square

The R-square analysis indicates that Trust in Technology has an R-square value of 0.281 and an adjusted R-square value of 0.273. This means that 28.1% of the variance in Trust in Technology is explained by Perceived Risk and Marketing Communication, while the remaining 71.9% is influenced by other variables outside the model.

Meanwhile, Purchase Decision has an R-square value of 0.426 and an adjusted R-square value of 0.417. This finding indicates that 42.6% of the variance in Purchase Decision is explained by Perceived Risk, Marketing Communication, and Trust in Technology. According to [Hair and Brunsveld \(2019\)](#), these values indicate moderate explanatory power.

Furthermore, the Q² values for Trust in Technology (0.261) and Purchase Decision (0.265) are greater than zero, confirming that the structural model possesses predictive relevance.

Table 4. R-Square Results

Variable	R-Square	R-Square Adjusted	Q ²
Trust in Technology	0.281	0.273	0.261
Purchase Decision	0.426	0.417	0.265

Source: Processed Data (2026)

F-Square

The F-square analysis was performed to evaluate the effect size of exogenous variables on endogenous variables. The results indicate that Marketing Communication has a relatively strong effect on Trust in Technology, with an F-square value of 0.344. Trust in Technology also demonstrates a moderate effect on Purchase Decision, with an F-square value of 0.246.

In contrast, Perceived Risk has a weak effect on Trust in Technology (0.031) and Purchase Decision (0.018). Marketing Communication also has a weak direct effect on Purchase Decision, with an F-square value of 0.096. These findings suggest that Trust in Technology plays an important role in influencing electric vehicle purchase decisions.

Table 5. F-Square Results

Relationship	F-Square	Effect Size
Perceived Risk → Trust in Technology	0.031	Weak
Marketing Communication → Trust in Technology	0.344	Strong
Perceived Risk → Purchase Decision	0.018	Weak
Marketing Communication → Purchase Decision	0.096	Weak
Trust in Technology → Purchase Decision	0.246	Moderate

Source: Processed Data (2026)

Hypothesis Testing

Hypothesis testing was conducted using the bootstrapping procedure in SmartPLS 4.0. A hypothesis is accepted when the t-statistic exceeds 1.96 and the p-value is below 0.05. The results reveal that Trust in Technology positively affects Purchase Decision, with an original sample value of 0.443, a t-statistic of 5.977, and a p-value of 0.000. Marketing Communication positively affects Trust in Technology, with a coefficient value of 0.499, a t-statistic of 9.567, and a p-value of 0.000. Marketing Communication also positively influences Purchase Decision, with a coefficient value of 0.273, a t-statistic of 4.134, and a p-value of 0.000.

Perceived Risk positively affects Trust in Technology, with a coefficient value of 0.149, a t-statistic of 2.596, and a p-value of 0.009. However, Perceived Risk does not significantly affect Purchase Decision directly because the t-statistic value is below 1.96 and the p-value exceeds 0.05.

The mediation analysis further demonstrates that Trust in Technology significantly mediates the relationship between Marketing Communication and Purchase Decision, with a coefficient value of 0.221, a t-statistic of 5.419, and a p-value of 0.000. Trust in Technology also significantly mediates the relationship between Perceived Risk and Purchase Decision, with a coefficient value of 0.066, a t-statistic of 2.590, and a p-value of 0.010.

Table 6. Hypothesis Testing Results

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
Trust in Technology -> Purchase Decision	0,443	0,439	0,074	5,977	0,000
Marketing Communication -> Trust in Technology	0,499	0,503	0,052	9,567	0,000
Marketing Communication -> Purchase Decision	0,273	0,278	0,066	4,134	0,000
Perceived Risk -> Trust in Technology	0,149	0,155	0,057	2,596	0,009
Perceived Risk -> Purchase Decision	0,105	0,112	0,065	1,616	0,106
Marketing Communication -> Trust in Technology -> Purchase Decision	0,221	0,220	0,041	5,419	0,000
Perceived Risk -> Trust in Technology -> Purchase Decision	0,066	0,067	0,025	2,590	0,010

DISCUSSION

The Effect of Perceived Risk on Purchase Decision

The findings indicate that perceived risk does not significantly influence purchase decisions, although the relationship is positive. This result suggests that consumers may not consider risk perception as the primary determinant when deciding to purchase electric motorcycles. Concerns regarding safety, battery durability, operational costs, charging infrastructure, and technical uncertainty may still exist; however, these concerns do not directly discourage consumers from purchasing electric vehicles (EVs). Instead, consumers appear to place greater emphasis on other factors, such as trust in technology and effective marketing communication, when evaluating EV adoption.

This finding implies that consumers in Indonesia may already possess sufficient awareness regarding EV technology, allowing them to tolerate certain risks associated with innovative products. In addition, increasing government campaigns, environmental awareness, and technological developments may reduce the negative influence of perceived risk on consumer purchasing behavior. The result also indicates that consumer perceptions toward risk may vary depending on individual experiences, accessibility of information, and familiarity with EV technology. Therefore, although perceived risk remains an important consideration, it may not directly determine purchase decisions in the context of electric motorcycles.

The Effect of Marketing Communication on Purchase Decision

The results demonstrate that marketing communication positively influences purchase decisions. This finding indicates that effective promotional activities can encourage consumers to adopt electric motorcycles. Marketing communication increases consumer awareness and confidence by highlighting benefits such as energy efficiency, environmental sustainability, operational cost savings, and after-sales services. Companies utilize digital advertising, social media platforms, promotional campaigns, and educational content to communicate the advantages of EV technology and influence consumer purchasing behavior.

In the Indonesian context, many consumers still have limited understanding regarding EV technology, particularly related to charging infrastructure, maintenance systems, and battery performance. Therefore, persuasive and informative marketing communication becomes essential in reducing uncertainty and improving public understanding. Previous studies also emphasize that interactive communication strategies, eco-friendly branding, and sustainability-oriented campaigns positively influence EV purchase decisions. However, the effectiveness of communication may decline when promotional messages are excessive or irrelevant. Consequently, companies should deliver objective, transparent, and evidence-based information to strengthen consumer confidence and support EV adoption.

The Effect of Perceived Risk on Trust in Technology

The findings reveal that perceived risk positively influences trust in technology. This result indicates that consumers who are more aware of potential risks tend to seek additional information and evaluate the reliability of EV technology more carefully before adoption. According to the Unified Theory of Acceptance and Use of Technology (UTAUT), trust is an important psychological factor influencing behavioral intention and technology usage. Concerns regarding technical failures, safety issues, maintenance costs, charging infrastructure, and battery durability encourage consumers to assess whether EV technology can reliably meet their expectations.

This finding suggests that risk perception does not always weaken trust. Instead, consumers may become more selective and analytical when evaluating technological innovations. When companies and service providers successfully provide warranties, transparent information, product demonstrations, and reliable after-sales services, consumers may develop stronger trust in EV technology despite the perceived risks. Therefore, risk perception can indirectly encourage consumers to gather more knowledge and strengthen their confidence in adopting innovative technologies.

The Effect of Marketing Communication on Trust in Technology

The results show that marketing communication positively influences trust in EV technology. Effective communication provides consumers with clear, credible, and relevant information that reduces uncertainty regarding the technology. Within the UTAUT framework, trust is considered an important factor influencing behavioral intention, and communication strategies play a critical role in shaping consumer confidence.

Marketing communication activities such as educational campaigns, product demonstrations, customer testimonials, social media engagement, and transparent information regarding product performance contribute to building positive perceptions of EV technology. Many consumers remain concerned about battery durability, charging infrastructure availability, electronic system safety, and operational efficiency. Therefore, marketing campaigns that address these concerns through informative and interactive content become highly important in increasing consumer trust.

In addition, consistent communication can strengthen brand image and enhance consumers' perceptions of technological reliability. Social media marketing that emphasizes informativeness and interactivity has also been shown to improve brand trust and support consumer confidence in EV adoption. Consequently, effective marketing communication serves as a strategic tool for reducing consumer doubts and strengthening trust in electric vehicle technology.

The Effect of Trust in Technology on Purchase Decision

The findings indicate that trust in technology positively influences purchase decisions. This result supports the assumption that consumers are more likely to purchase electric motorcycles when they believe that the technology is reliable, beneficial, safe, and easy to use. Within the UTAUT framework, trust strengthens behavioral intention by increasing consumer confidence toward technological innovation.

In the electric motorcycle market, concerns regarding charging infrastructure, battery performance, and technical reliability often become barriers to adoption. However, companies can reduce consumer hesitation by providing warranties, product testing opportunities, transparent information, and high-quality after-sales services. Trust reflects consumers' beliefs regarding the safety, efficiency, reliability, and performance of EV technology, thereby reducing uncertainty associated with purchasing decisions.

This finding also indicates that consumer trust plays a central role in supporting EV adoption in Indonesia. As consumers receive more accurate and transparent information regarding EV technology, their confidence increases, which subsequently encourages purchase decisions. Therefore, building consumer trust should become a major priority for companies and policymakers aiming to accelerate electric vehicle adoption.

The Mediating Effect of Trust in Technology on the Relationship Between Perceived Risk and Purchase Decision

The results demonstrate that trust in technology significantly mediates the relationship between perceived risk and purchase decisions. This finding indicates that although consumers may perceive risks related to battery durability, maintenance costs, infrastructure limitations, or technical performance, trust in technology can reduce uncertainty and encourage purchasing behavior. Within the UTAUT framework, trust functions as an important mechanism that bridges perceived risk and consumer behavioral intention.

In Indonesia, the relatively low adoption rate of electric vehicles is often associated with concerns regarding infrastructure readiness and technological reliability. However, initiatives such as technological education, warranties, government support, and product performance demonstrations can increase public trust and minimize the negative impact of perceived risks. Consumers who trust EV technology are more likely to feel confident in making purchase decisions despite existing uncertainties.

This finding highlights the importance of trust as a mediating factor in technology adoption. Companies and policymakers should therefore focus on strengthening public trust through transparent communication, infrastructure improvement, and consistent technological innovation to support the growth of the electric vehicle market.

The Mediating Effect of Trust in Technology on the Relationship Between Marketing Communication and Purchase Decision

The findings further reveal that trust in technology significantly mediates the influence of marketing communication on purchase decisions. This result suggests that marketing communication not only directly affects consumer decisions but also indirectly influences purchasing behavior through the development of consumer trust in EV technology.

Within the UTAUT framework, marketing communication acts as a source of information and a facilitating condition that shapes consumer perceptions, social influence, and behavioral intentions. Consumers often hesitate to adopt EVs because of concerns regarding charging infrastructure, battery life, and technical reliability. However, marketing campaigns emphasizing warranties, user experiences, product demonstrations, educational content, and technological benefits can strengthen consumer trust and transform hesitation into purchase decisions.

Effective communication also creates positive consumer perceptions by delivering transparent, informative, and persuasive messages regarding EV technology. Previous studies indicate that media exposure and social media marketing significantly increase public trust, which subsequently influences consumer purchasing behavior. Therefore, trust in technology serves as a crucial mediating variable that connects marketing communication and purchase decisions, emphasizing the importance of strategic communication in promoting EV adoption.

CONCLUSION

This study concludes that trust in technology is an important factor influencing electric vehicle purchase decisions, particularly in the electric motorcycle market in Indonesia. Marketing communication positively affects both trust in technology and purchase decisions by providing informative, transparent, and educational messages regarding the benefits, efficiency, and reliability of EV technology. Meanwhile, perceived risk does not significantly influence purchase decisions directly, although it significantly affects trust in technology, indicating that consumers tend to evaluate technological reliability and safety

before adoption. Furthermore, trust in technology successfully mediates the relationships between perceived risk, marketing communication, and purchase decisions, highlighting its important role in reducing consumer uncertainty and encouraging EV adoption. These findings imply that companies and policymakers should strengthen consumer trust through effective communication strategies, technological education, and infrastructure development to support sustainable transportation adoption in Indonesia. Future researchers are encouraged to explore additional factors influencing EV adoption, such as environmental awareness, government incentives, and social influence, to provide a broader understanding of consumer behavior toward electric vehicles.

LIMITATION

Several constraints must be acknowledged in this research. Primarily, a cross-sectional approach combined with purposive sampling from targeted locales was utilized for data gathering, potentially restricting the applicability of results to Indonesia's broader electric vehicle consumer base. Moreover, focus was confined to electric motorcycles alone, rendering the outcomes only partially relevant to alternative EV categories like automobiles or scooters, which exhibit distinct technical attributes and buyer tendencies.

Secondly, reliance was placed on participants' subjective assessments of risk, promotional outreach, and technological confidence, susceptible to modulation by individual histories, expertise, and informational encounters. Deeper scrutiny of extraneous elements such as policy shifts, charging network provisions, and marketplace dynamics was omitted, despite their potential to sway buying inclinations. Consequently, enhanced generalizability could be pursued in subsequent investigations through broader geographic scope, inclusion of diverse EV variants, and integration of such external influences.

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DECLARATION OF CONFLICTING INTERESTS

The authors declare that there are no potential conflicts of interest concerning the research, authorship, or publication of this study on electric vehicle users and their purchase intentions.

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