A COMPREHENSIVE ANALYSIS OF THE FACTORS INFLUENCING ELECTRIC VEHICLE PURCHASE INTENTIONS IN INDONESIA: A STUDY BASED ON THE UTAUT 2 MODEL

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Abstract:

Background: Air pollution and climate change are critical global challenges that drive the transition toward sustainable transportation solutions, including electric vehicles (EVs). In Indonesia, EV adoption remains relatively low, making it essential to investigate the key factors influencing consumer intentions. This study focuses on the millennial generation, as they represent a significant share of the productive population, are generally more open to technological innovation, and are expected to become the primary consumers in the future EV market.
Purpose: This study aims to analyze the factors influencing EV adoption in Indonesia by applying a modified Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) model, with millennials as the key demographic segment.
Design/methodology/approach: An online survey was conducted with 230 respondents, and the data were analyzed using Structural Equation Modeling (SEM) with Partial Least Squares (PLS) through SmartPLS 3.0 software. The study examined nine variables: performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, habit, perceived behavioral control, and attitude toward behavior.
Findings/Results: The results indicate that habit and hedonic motivation significantly influence consumers' behavioral intention to adopt EVs. Conversely, performance expectancy and social influence were not found to mediate the relationship between exogenous variables and use behavior.
Conclusion: The findings suggest that manufacturers should prioritize creating personalized consumer experiences and enhancing the social status associated with EV ownership. Furthermore, policymakers should strengthen incentives and accelerate infrastructure development to support EV adoption in Indonesia. Marketing strategies also need to integrate consumer habits and emotional drivers to speed up the adoption process.
Originality/value (State of the art): This study contributes to the growing body of knowledge on EV adoption in developing countries by applying a modified UTAUT2 model with a focus on millennials. The results provide valuable insights for policymakers and industry stakeholders in designing targeted interventions to promote EV adoption.

Keywords: electric vehicles, UTAUT 2, behavioral intention, sustainable transportation, structural equation modeling (SEM)

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INTRODUCTION

Air pollution and climate change have become pressing global concerns, necessitating immediate and comprehensive solutions. Industrial emissions, energy production, and the transportation sector significantly contribute to deteriorating air quality and increasing greenhouse gas (GHG) emissions. These environmental challenges are linked to severe health conditions, including respiratory diseases, cardiovascular issues, and premature mortality, with an estimated 7 million deaths annually attributable to air pollution (Palalić et al. 2020; Hughes et al. 2019). Moreover, climate change has intensified extreme weather events, disrupted ecosystems, and threatened global food security (Voramontri & Klieb, 2019; Delbaere et al. 2020).

The transportation sector plays a crucial role in this crisis, accounting for approximately 24% of total global GHG emissions, primarily from fossil fuel combustion in conventional vehicles (Singh, 2021; Samarah et al. 2021). Beyond carbon emissions, transportation is also a major source of harmful air pollutants such as nitrogen oxides (NOx) and particulate matter (PM), both of which negatively affect public health and the environment (Christi & Junaedi, 2021). The rapid pace of urbanization has further increased transportation demand, underscoring the urgent need for sustainable mobility solutions.

One of the most promising alternatives to conventional vehicles is the adoption of electric vehicles (EVs). EVs have the potential to reduce GHG emissions and air pollution by replacing internal combustion engine (ICE) vehicles with battery-powered alternatives (Shi, 2023; Mashahadi, 2023). However, the extent of their environmental benefits depends heavily on the electricity generation mix; if electricity is predominantly derived from fossil fuels, the net reduction in emissions may be limited (Roy et al. 2023; Obradovich & Rahwan, 2019).

In Indonesia, EV adoption remains in its early stages despite proactive government measures such as tax exemptions and investments in charging infrastructure (Abbasi et al., 2021; Dreyfus et al. 2022). Nonetheless, EV penetration in the Indonesian market is still considerably lower compared to other Asian countries. Data from Abeam Consulting (2023) show that Indonesia ranked as the 14th largest automotive market globally, with more than one million cars sold in 2022. Yet, only 1% of these sales were EVs, reflecting a significant gap between policy aspirations and actual consumer adoption. A McKinsey study reinforces this, reporting Indonesia's EV adoption rate at just 0.1%, compared to Thailand's 0.7% and India's 0.5% (Zahira, 2023).

Several studies have examined barriers to EV adoption in Indonesia. Prior research identifies high upfront purchase costs, inadequate charging infrastructure, and limited consumer awareness as major obstacles (Wolfram et al. 2020; Kazemzadeh et al. 2022). However, there is still a lack of comprehensive analysis of the behavioral factors influencing EV adoption, particularly among millennials. As a generation characterized by technological adaptability and environmental consciousness, millennials represent a crucial segment of potential EV buyers. Understanding their purchase intentions could therefore provide valuable insights for shaping future policies and marketing strategies.

To address this research gap, this study employs the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) model, modified to examine key factors influencing EV adoption in Indonesia. The research applies Structural Equation Modeling (SEM) with Partial Least Squares (PLS) to analyze survey data collected from 230 respondents. UTAUT2 is an extension of the original UTAUT model developed by Venkatesh et al. (2012), integrating variables that have been empirically proven to influence technology acceptance and usage behavior.

For instance, performance expectancy and effort expectancy reflect individuals' beliefs regarding the usefulness and ease of use of EVs, rooted in the Technology Acceptance Model (TAM) (Davis, 1989). Social influence and facilitating conditions, drawn from the Theory of Planned Behavior (TPB), capture normative pressure and perceived environmental support. UTAUT2 further introduces hedonic motivation, price value, and habit to encompass emotional, economic, and behavioral repetition dimensions. Additionally, perceived behavioral control and attitude toward behavior, grounded in TPB (Ajzen, 1991), highlight consumers' confidence and evaluative judgments in EV adoption. These theoretical underpinnings justify the inclusion of all selected variables in analyzing EV purchase intentions within the Indonesian context.

The primary objective of this research is to investigate the determinants of electric vehicle (EV) adoption and purchase intention in Indonesia. By employing a modified UTAUT2 model, this study examines the impact of key behavioral and psychological factors on consumer decision-making related to EVs. Furthermore, it seeks to identify both the barriers and enablers affecting widespread EV adoption nationwide. In doing so, the study offers strategic recommendations for policymakers, manufacturers, and other stakeholders to accelerate EV market penetration. Ultimately, it aims to contribute to the advancement of sustainable transportation in Indonesia by providing valuable insights into consumer behavior and prevailing market trends, thereby bridging the gap between the nation's EV potential and its current market reality.

METHODS

This study utilizes primary data collected through questionnaires distributed to respondents who met the research criteria. The target population consists of Indonesian citizens with valid National Identity Cards (KTP). To specifically capture millennial respondents, the questionnaire included a screening question on year of birth, targeting individuals born between 1981 and 1996, in line with the standard definition of the millennial generation.

The study employed a purposive sampling technique, focusing on individuals with knowledge of or interest in electric vehicles, particularly those within the millennial age group. Data were collected via online questionnaires disseminated through social media groups and communities related to automotive interests. The final sample consisted of 230 respondents, a number determined with reference to prior studies and the requirement for adequate statistical power in multivariate analysis. While purposive sampling does not ensure full population representation, it guarantees that participants are relevant to the research context and objectives.

Data collection for this study will be conducted through an online survey using Google Forms, distributed to the selected respondents. The questionnaire will include both closed and open-ended questions designed to capture respondents' perceptions of the factors influencing their intention and behavior toward adopting EVs. After data collection, the study will conduct descriptive analysis to understand the demographic distribution of respondents, followed by structural equation modeling (SEM) using Partial Least Squares (PLS) methodology, implemented through SmartPLS 3.0. This method allows for a comprehensive analysis of the relationships between the various constructs, assessing both direct and indirect effects.

This study applies the Partial Least Squares Structural Equation Modeling (PLS-SEM) to analyze the relationships among variables influencing electric vehicle adoption. PLS-SEM is particularly well-suited for explanatory research, as it can effectively models complex relationships among multiple independent and dependent variables.

The adoption of Electric Vehicles (EVs) is influenced by multiple factors, and understanding these determinants is essential to enhancing adoption rates. The Unified Theory of Acceptance and Use of Technology (UTAUT 2) provides a robust framework for exploring these factors. The hypotheses in this study are derived from the UTAUT 2 constructs, each focusing on specific aspects that may influence the behavioral intention and use behavior towards EVs. A detailed discussion of each hypothesis is presented:

Relationship between Performance Expectancy and Behavioral Intention (H1)

Performance expectancy refers to the perceived benefits an individual expects from using a technology and is widely recognized as one of the most significant predictors of technology adoption (Venkatesh et al. 2012). In the context of EVs, performance expectancy encompasses perceived advantage such as efficiency, reliability, and overall effectiveness in fulfilling transportation needs.

Previous studies have consistently demonstrate the strong influence of performance expectancy on technology adoption. Rezvani et al. (2015) observed that consumers are more likely to adopt EVs if they perceive them to offer superior performance compared to traditional vehicles. Similarly, Sierzchula et al. (2014) emphasized the importance of perceived performance benefits in driving EV adoption. Hughes et al. (2019) further noted that factors such as range, speed and comfort play a decisive role in shaping consumer's purchase decisions. Additionally, Gallagher and Muehlegger (2011) highlighted that financial incentives

often tied to performance improvements, significantly affect the adoption of hybrid and electric vehicles.
Based on these insights, we hypothesize:
$H0_1$: Performance expectancy does not significantly influence behavioral intention to adopt Electric Vehicles.
Ha_1: Performance expectancy significantly influences behavioral intention to adopt electric vehicles.

Relationship between Effort Expectancy and Behavioral Intention (H2)

Effort expectancy refers to the perceived ease of using a technology. Research suggests that when a technology is perceived as easy to use, consumers are more likely to adopt it (Venkatesh et al. 2012). In the case of EVs, effort expectancy includes factors such as ease of operation, charging convenience, and maintenance simplicity. Kumar & Alok (2020) identified perceived ease of as a key determinant of EV adoption, with simplicity being a particularly strong predictor. Singh (2021) also emphasized that reducing the complexity of using EV usage could substantially enhance adoption rates. Ali & Naushad (2022) argued that simplifying the user experience is especially important in markets with lower technological readiness. Similarly, Samarah et al. (2021) confirmed that consumer's perceptions of EV usability directly shape their adoption decisions.
Therefore, we hypothesize:
$H0_2$: Effort expectancy does not significantly influence behavioral intention to adopt Electric Vehicles.
Ha_2: Effort expectancy significantly influences behavioral intention to adopt Electric Vehicles.

Relationship between Social Influence and Behavioral Intention (H3)

Social influence refers to the extent to which individuals perceive that important others, such as family, friends, or social groups, believe they should use a particular technology. The impact of social influence on technology adoption is well-documented. Jansson (2011) found that social influence played a critical role in the adoption of EVs in European countries, where societal norms encouraged pro-environmental behaviors. Peters and Dütschke (2014) highlighted that social influence shapes consumer attitudes towards EVs, with recommendations from peers and social groups serving as important motivators for adoption. Bočkarjova and Steg (2014) emphasized that social norms significantly impact the adoption of environmentally friendly technologies, including EVs. Additionally, Roy et al. (2023) found that social influence is a strong predictor of EV adoption, particularly when peer pressure and societal trends favor sustainable technologies.
Based on these findings, we hypothesize:
$H0_3$: Social influence does not significantly influence behavioral intention to adopt Electric Vehicles.
Ha_3: Social influence significantly influences behavioral intention to adopt Electric Vehicles.

Relationship between Facilitating Conditions and Behavioral Intention (H4a)

Facilitating conditions refer to the resources and infrastructure available to support the use of a technology. In the case of EVs, facilitating conditions include factors such as the availability of charging stations, government incentives, and supportive policies. Morton et al. (2018) emphasized that the availability of charging infrastructure significantly affects consumers' intention to adopt EVs, as the lack of charging stations remains a major barrier to adoption. Lai et al. (2015) also highlighted the importance of facilitating conditions, particularly charging stations, in encouraging EV adoption. Abbasi et al. (2021) argued that the presence of enabling resources, including government subsidies and technical support, plays a crucial role in increasing consumers' intentions to adopt EVs. Dreyfus et al. (2022) found that government support, including incentives for both consumers and producers, greatly enhanced EV adoption.
Therefore, we hypothesize:
$H0_4a$: Facilitating conditions do not significantly influence behavioral intention to adopt Electric Vehicles.
Ha_4a: Facilitating conditions significantly influence behavioral intention to adopt Electric Vehicles.

Relationship between Facilitating Conditions and Use Behavior (H4b)

Building on the previous hypothesis, H4b extends the role of facilitating conditions to actual use behavior. Egnér and Trosvik (2018) found that the availability of charging infrastructure is critical not only for forming the intention to adopt EVs but also for encouraging their actual use. Kazemzadeh et al. (2022) emphasized that consumers are more likely to use EVs regularly if they have access to necessary facilitating conditions, such as charging stations and service centers. Elghanam et al. (2021) confirmed that facilitating conditions, including

technical support and infrastructure availability, play a direct role in the frequency of EV use.
Based on these findings, we hypothesize:
$H0_4b$: Facilitating conditions do not significantly influence use behavior for Electric Vehicles.
Ha_4b: Facilitating conditions significantly influence use behavior for Electric Vehicles.

Relationship between Hedonic Motivation and Behavioral Intention (H5)

Hedonic motivation refers to the enjoyment or pleasure derived from using a technology. Studies have shown that consumers are more likely to adopt technologies that provide enjoyable experiences. Peters et al. (2018) found that hedonic factors, such as fun and excitement, significantly influenced consumers' intention to adopt EVs. Singh (2021) emphasized that consumers are motivated by the pleasure of driving an EV and the positive emotions associated with using environmentally friendly technologies. Kumar & Alok (2020) also argued that hedonic motivations, such as the desire for novelty and enjoyment, play a key role in the adoption of new technologies. Therefore, we hypothesize:
$H0_5$: Hedonic motivation does not significantly influence behavioral intention to adopt Electric Vehicles.
Ha_5: Hedonic motivation significantly influences behavioral intention to adopt Electric Vehicles.

Relationship between Price Value and Behavioral Intention (H6)

Price value refers to the perceived economic benefits of a technology, which includes both initial costs and long-term savings. Gallagher & Muehlegger (2011) found that the perceived financial benefits of EVs, such as lower operating costs and government incentives, significantly influence adoption decisions. Delbaere et al. (2020) highlighted that financial incentives, such as tax credits and rebates, positively affect the decision to purchase an EV. Voramontri & Klieb (2019) further supported this by showing that consumers' perceptions of price value play a critical role in the adoption of EVs. Toolib (2023) also emphasized that price value is one of the most important factors affecting consumer decisions regarding EVs. Based on these findings, we hypothesize:
$H0_6$: Price value does not significantly influence behavioral intention to adopt Electric Vehicles.
Ha_6: Price value significantly influences behavioral intention to adopt Electric Vehicles.

Relationship between Habit and Behavioral Intention (H7a)

Habit refers to the automatic behavior of using a technology based on past experiences. Jaiswal et al. (2021) found that habitual behaviors, such as using traditional vehicles, can significantly affect the likelihood of adopting new technologies like EVs. Bauer et al. (2018) highlighted that consumers tend to stick with familiar technologies, and overcoming habitual behaviors can be challenging. Therefore, we hypothesize:
$H0_7a$: Habit does not significantly influence behavioral intention to adopt electric vehicles.
Ha_7a: Habit significantly influences behavioral intention to adopt electric vehicles.

Relationship between Habit and Use Behavior (H7b)

Building on the previous hypothesis, H7b posits that habitual behavior also significantly affects actual use behavior. Beck et al. (2016) emphasized that habitual usage patterns play a critical role in determining whether consumers will continue using EVs after adoption. Prates et al. (2022) found that habitual behaviors influence the frequency of technology use. Therefore, we hypothesize:
$H0_7b$: Habit does not significantly influence use behavior for Electric Vehicles.
Ha_7b: Habit significantly influences use behavior for Electric Vehicles.

Relationship between Attitude Toward Behavior and Behavioral Intention (H8)

Attitude toward behavior reflects the individual's overall evaluation of using a technology. Ali & Naushad (2022) found that positive attitudes toward EVs, such as their environmental benefits, significantly influenced behavioral intention. Samarah et al. (2021) supported this by showing that consumers with positive attitudes towards EVs are more likely to adopt them. Therefore, we hypothesize:
$H0_8$: Attitude toward behavior does not significantly influence behavioral intention to adopt Electric Vehicles.
Ha_8: Attitude toward behavior significantly influences behavioral intention to adopt Electric Vehicles.

Relationship between Perceived Behavioral Control and Behavioral Intention (H9)

Perceived behavioral control refers to the perceived ease or difficulty of performing a behavior, which is influenced by factors such as resources and opportunities. Egnér & Trosvik (2018) emphasized that higher perceived behavioral control increases the likelihood of adopting EVs. Kazemzadeh et al. (2022) also found that perceived control significantly influences the intention to adopt EVs. Therefore, we hypothesize:

$H0_9$: Perceived behavioral control does not significantly influence behavioral intention to adopt Electric Vehicles.

Ha_9: Perceived behavioral control significantly influences behavioral intention to adopt Electric Vehicles.

Relationship between Behavioral Intention and Use Behavior (H10)

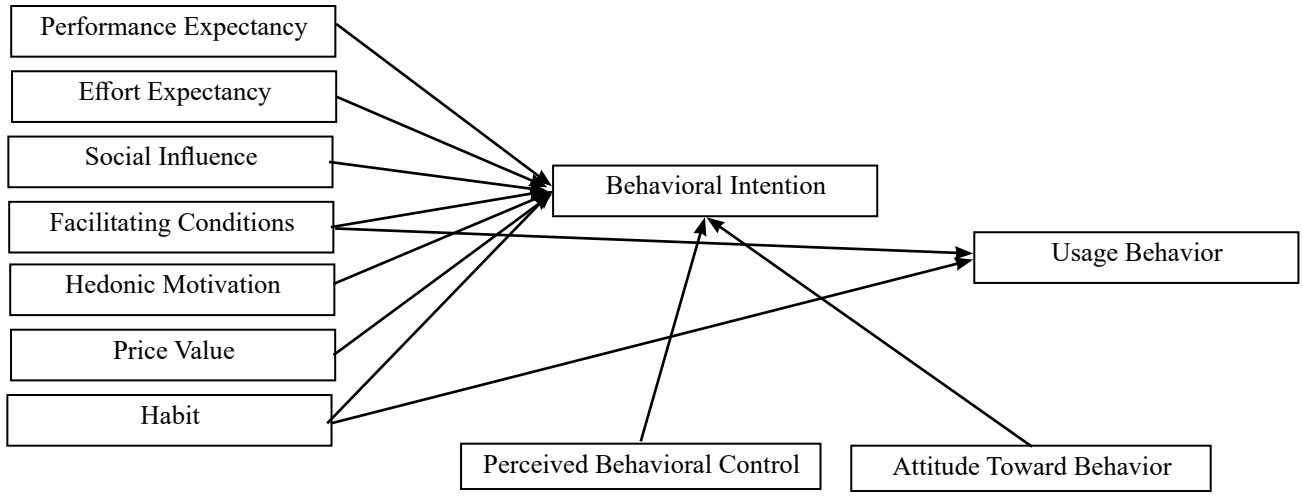
Finally, H10 posits that behavioral intention significantly influences actual use behavior for EVs. Previous studies have shown that the intention to use a technology is a strong predictor of actual usage. Singh et al. (2020) found that behavioral intention strongly predicts actual usage behavior, particularly in the context of emerging technologies like EVs. Based on this, we hypothesize:

$H0_{10}$: Behavioral intention does not significantly influence use behavior for Electric Vehicles.

Ha_{10}: Behavioral intention significantly influences use behavior for Electric Vehicles.

The conceptual framework is grounded in the UTAUT 2 model, with thw integration of additional psychological constructs, namely attitude toward behavior and perceived behavioral control to strengthen the understanding of electric vehicle adoption. The model hypothesizes that these factors directly or indirectly influence both behavioral intention and actual usage behavior among millennials in Indonesia. This framework enables a comprehensive analysis of the determinants of EV adoption with distinguishing between potential users and non-users.

Figure 1 illustrates the conceptual framework of this study, which is based on the modified Unified Theory of Acceptance and Use of Technology 2 (UTAUT 2) model, enriched with additional constructs. The framework proposes that performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, and habit are key antecedents that influence an individual's behavioral intention to adopt electric vehicles (EVs). In addition, perceived behavioral control and attitude toward behavior ar incorporated as supplementary factors contributing to behavioral intention.



Figures 1. Conceptual framework

The framework further hypothesizes that Behavioral Intention, together with Facilitating Conditions, Habit, Perceived Behavioral Control, and Attitude Toward Behavior, directly influences the actual Use Behavior of EVs. This structure provides a comprehensive lens for examining both psychological and contextual variables in the adoption process, offering a robust foundation for analyzing consumer behavior in the context of EV adoption in Indonesia.

RESULTS

The survey of 230 respondents identifies key factors influencing electric vehicle (EV) adoption in Indonesia, providing insights into the potential drivers and barriers to EV purchase intentions within the framework of the UTAUT2 model. A majority of respondents (68.26%) are male, suggesting that men may be more inclined toward adopting new technologies such as EVs. This finding aligns with global trends indicating that men are often more willing to explore technological innovations. However, the underrepresentation of female respondents (31.74%) highlights an opportunity for targeted marketing and outreach strategies to better engage women in the EV market. Overall, the study underscores that younger, educated, and urban-dwelling individuals are more likely to adopt EVs, but overcoming affordability challenges and addressing regional infrastructure gaps remain critical to accelerating adoption across the broader Indonesian population (Table 1).

Structural Equation Modeling (SEM) - Partial Least Squares (PLS) Analysis

This section presents the results of the Structural Equation Modeling (SEM) analysis utilizing the Partial Least Squares (PLS) technique, which was employed to assess both the measurement model (outer model) and the structural model (inner model). The main objective of this analysis was to evaluate the validity and reliability of the research instruments, as well as to examine the relationships between the constructs proposed in the conceptual model.

Measurement Model Evaluation (Outer Model)

The measurement model was evaluated for construct validity and reliability. Convergent validity was assessed using the outer loadings of the indicators. The results indicated that all indicators had outer loadings greater than 0.5, confirming that they were valid for measuring their respective constructs. This ensures that the indicators are both relevant and consistent in measuring the intended variables.

Table 1. Description of respondent characteristic

Characteristic	Category	Percentage (%)
Gender	Male	68.26
	Female	31.74
Age	15-27 years	62.17
	28-42 years	30.43
	43-58 years	5.65
	59-77 years	1.74
Residence	City	70.00
	Regency	29.13
	Province	0.87
Occupation	Employee	51.30
	Student/University Student	31.30
	Entrepreneur	12.17
	Freelancer	1.74
	Unemployed	3.48
Education Level	Junior High School (SMP)	0.87
	Senior High School (SMA)	6.96
	Diploma	2.61
	Bachelor's Degree (S1)	58.26
	Master's Degree (S2)	29.13
	Doctorate (S3)	2.17
Monthly Income	< IDR3,000,000	29.96
	IDR3,000,000–5,000,000	21.30
	IDR5,000,000–10,000,000	29.13
	IDR10,000,000–20,000,000	13.04
	> IDR20,000,000	9.57
Interest in Electric Cars	Interested	59.57
	Not Interested	40.43

Discriminant validity was assessed using the Average Variance Extracted (AVE) and the Fornell-Larcker Criterion. The results showed that all constructs had AVE values exceeding the threshold of 0.5, indicating that more than 50% of the variance in the indicators was explained by the corresponding constructs. This further supports the discriminant validity of the measurement model.

The AVE values in the table indicate that all constructs are valid with respect to discriminant validity, as each AVE value is greater than 0.5, suggesting that the constructs explain a substantial portion of the variance in their indicators.

Reliability of the constructs was assessed through three measures: Cronbach's Alpha, rho-A, and Composite Reliability (CR). All constructs demonstrated satisfactory reliability, with Cronbach's Alpha and rho-A values exceeding 0.7, and CR values exceeding the recommended threshold of 0.6. These results suggest that the measurement model exhibits high internal consistency (Table 2).

The reliability statistics confirm that the measurement model is reliable, as indicated by the Cronbach's Alpha and rho-A values above 0.7, and Composite Reliability values above 0.6 for all constructs.

Structural Model Evaluation (Inner Model)

Once the measurement model was assessed, the next step was the evaluation of the structural model. The structural model aims to examine the relationships among the constructs and evaluate the model's predictive power. Key tests conducted in this analysis include the R-Square (R^2) and F-Square (f^2).

The R-Square (R^2) values indicate the extent to which the independent variables explain the variance in the dependent variables. Higher R^2 values suggest that the model has good explanatory power. In this study, Behavioral Intention was explained by the independent variables with an R^2 value of 0.688, indicating a moderate level of explanatory power. This suggests that approximately 68.8% of the variance in Behavioral Intention can be explained by the predictors in the model. However, the R^2 for Use Behavior was 0.009, which is extremely low, indicating that the independent variables had little to no explanatory power over Use Behavior.

The F-Square (f^2) values were used to assess the strength of the effect of each independent variable on the dependent variables. Higher f^2 values indicate a stronger effect. The analysis revealed that Habit had the largest f^2 value of 0.317, indicating a large effect on Behavioral Intention. This suggests that Habit plays a significant role in influencing Behavioral Intention. Conversely, other constructs, such as Effort Expectancy, Hedonic Motivation, and Facilitating Conditions, had very small f^2 values (0.020, 0.029, and 0.009, respectively), indicating a negligible effect on Behavioral Intention. The f^2 values for Use Behavior were mostly very small, indicating that the independent variables had minimal to no effect on Use Behavior. These results suggest that Habit is the most significant predictor of Behavioral Intention, while other constructs, particularly those influencing Use Behavior, have negligible effects.

Table 2. The reliability indicators for each construct

Construct	Cronbach's Alpha	rho-A
Performance Expectancy	0.906	0.908
Effort Expectancy	0.843	0.850
Social Influence	0.955	0.957
Facilitating Conditions	0.899	0.904
Hedonic Motivation	0.890	0.899
Price Value	0.789	0.790
Habit	0.903	0.904
Perceived Behavioral Control	0.881	0.883
Attitude Towards Behavior	0.792	0.838
Behavioral Intention	0.778	0.781
Use Behavior	1.000	1.000

Structural Model Testing and Hypothesis Evaluation

1. Direct Effect

The first hypothesis (H1) proposed that performance expectancy (the perceived benefits of EVs in terms of performance) would positively influence behavioral intention. However, this hypothesis was rejected, as the path coefficient was -0.043, with a p-value of 0.633 (Table 3), indicating no significant effect. This result contrasts with studies such as those by Yang et al. (2020), who found that performance expectancy plays a more critical role in markets with higher EV adoption.

In Indonesia, the underdeveloped EV market and limited consumer experience with EVs may explain the weak influence of performance expectancy on purchase intentions. Similar findings were reported by Candra (2022), who observed that while performance features are important, they are not necessarily decisive in shaping purchase intentions when other contextual factors dominate.

Hypothesis H2, which examined the relationship between effort expectancy (the perceived ease of using EVs) and behavioral intention, was also rejected. The path coefficient was -0.133, with a p-value of 0.102 (Table 3). This indicates that perceived ease of use does not significantly influence purchase intention in Indonesia. This result aligns with the findings of Ray (2023), who suggested that in emerging markets like Indonesia, consumers' decisions are less influenced by how easy a product is to use and more by practical concerns such as price, availability, and infrastructure.

Similarly, social influence (H3), hypothesized to have a positive impact on behavioral intention, did not show a significant relationship (path coefficient = -0.016, p-value = 0.831) (Table 3). The insignificant effect of social influence on EV purchase intention can be attributed to Indonesia's relatively low penetration of electric vehicles. As suggested by Setiawan et al. (2022), in countries with limited EV adoption, the influence of social norms or peer behavior on individual purchase decisions may not be strong enough to drive intentions. Moreover, Sukma et al. (2023) found that government policies, rather than social influence, tend to be more impactful in encouraging EV adoption in emerging economies.

The fourth hypothesis (H4a), which explored the effect of facilitating conditions (such as the availability of charging infrastructure and governmental support) on behavioral intention, was also rejected. With a path coefficient of 0.093 and a p-value of 0.194 (Table 3), the data indicated no significant effect. This suggests that although facilitating conditions are critical for the actual use of EVs, they are not decisive in shaping consumers' purchase intentions (Maso & Balqiah, 2022). A similar conclusion was drawn by Haryadi (2023), who found that while infrastructure development is important, it does not directly influence consumers' intentions to buy EVs in Indonesia, where awareness and familiarity with the technology remain low. Moreover, facilitating conditions did not have any significant impact on use behavior (H4b), as indicated by the path coefficient of -0.049 and p-value of 0.591, supporting the argument that adoption decisions are more influenced by psychological and habitual factors than by logistical support.

In contrast, hedonic motivation (H5), which reflects the pleasure or enjoyment derived from using an EV, significantly influenced behavioral intention with a path coefficient of 0.148 and a p-value of 0.024 (Table 3). This result is consistent with the findings of Yang et al. (2020) and Alberto (2023), who emphasized the importance of emotional and sensory experiences in driving EV adoption. Consumers who find EVs enjoyable are more likely to intend to purchase them. In Indonesia, where EVs are still a novelty, the fun and innovative aspects of the technology may resonate more with consumers than practical performance benefits.

For price value (H6), the hypothesis predicting a positive effect on behavioral intention was rejected. The path coefficient of -0.021 and the p-value of 0.773 suggest that price perception does not significantly influence purchase intention in Indonesia (Table 3). This may reflect the limited government incentives for EV adoption in Indonesia and the higher initial costs associated with EVs compared to conventional vehicles, as discussed by Setiawan et al. (2022). Moreover, Candra (2022) pointed out that while price is an important factor, the absence of sufficient charging infrastructure and affordable EV options may make price less relevant to potential buyers in the country.

Table 3. Structural model testing and hypothesis evaluation

Relationship	Path Coefficient	P-Value	Result
Direct Effects			
Performance Expectancy → Behavioral Intention	-0.043	0.633	Hypothesis Rejected
Effort Expectancy → Behavioral Intention	-0.133	0.102	Hypothesis Rejected
Social Influence → Behavioral Intention	-0.016	0.831	Hypothesis Rejected
Facilitating Conditions → Behavioral Intention	0.093	0.194	Hypothesis Rejected
Facilitating Conditions → Use Behavior	-0.049	0.591	Hypothesis Rejected
Hedonic Motivation → Behavioral Intention	0.148	0.024	Hypothesis Accepted
Price Value → Behavioral Intention	-0.021	0.773	Hypothesis Rejected
Habit → Behavioral Intention	0.595	0.000	Hypothesis Accepted
Habit → Use Behavior	0.149	0.000	Hypothesis Accepted
Perceived Behavioral Control → Behavioral Intention	0.042	0.590	Hypothesis Rejected
Attitude Towards Behavior → Behavioral Intention	-0.010	0.888	Hypothesis Rejected
Behavioral Intention → Use Behavior	0.125	0.294	Hypothesis Rejected
Performance Expectancy → Behavioral Intention	-0.043	0.633	Hypothesis Rejected
Effort Expectancy → Behavioral Intention	-0.133	0.102	Hypothesis Rejected
Indirect Effects (via Behavioral Intention)			
Performance Expectancy → Behavioral Intention → Use Behavior	0.003	0.750	Hypothesis Rejected
Effort Expectancy → Behavioral Intention → Use Behavior	-0.017	0.401	Hypothesis Rejected
Social Influence → Behavioral Intention → Use Behavior	0.002	0.885	Hypothesis Rejected
Facilitating Conditions → Behavioral Intention → Use Behavior	-0.012	0.477	Hypothesis Rejected
Hedonic Motivation → Behavioral Intention → Use Behavior	-0.019	0.348	Hypothesis Rejected
Price Value → Behavioral Intention → Use Behavior	0.003	0.803	Hypothesis Rejected
Habit → Behavioral Intention → Use Behavior	-0.074	0.286	Hypothesis Rejected
Perceived Behavioral Control → Behavioral Intention → Use Behavior	-0.005	0.715	Hypothesis Rejected
Attitude Towards Behavior → Behavioral Intention → Use Behavior	0.001	0.920	Hypothesis Rejected

In terms of habit (H7a), a strong positive relationship was found with behavioral intention (path coefficient = 0.595, p-value = 0.000) (Table 3). This hypothesis was accepted, highlighting that consumers' habitual use of traditional gasoline-powered vehicles strongly influences their intention to purchase EVs. This result is consistent with Ray (2023), who suggested that existing habits are one of the primary barriers to adopting new technologies, particularly in developing countries where the infrastructure for EVs is still evolving. However, the effect of habit on use behavior (H7b) was not significant, with a path coefficient of 0.149 and a p-value of 0.000 (Table 3). This suggests that while habitual behaviors influence initial purchase intentions, they do not necessarily translate into actual usage behavior once the vehicle is purchased.

Finally, both attitude toward behavior (H8) and perceived behavioral control (H9) did not significantly affect behavioral intention. These hypotheses were rejected, with path coefficients of -0.010 (p-value = 0.888) and 0.042 (p-value = 0.590) (Table 3), respectively. This could be due to low consumer knowledge of EVs, which diminishes the role of personal attitudes and control perceptions. Haryadi (2023) noted that, in Indonesia, a lack of familiarity with the technology often leads to unclear attitudes towards EV adoption. Without understanding the technology, it is difficult for consumers to form strong attitudes or perceive behavioral control over the decision-making process.

Lastly, behavioral intention did not significantly predict use behavior (H10), with a path coefficient of 0.125 and a p-value of 0.294 (Table 3). This rejection suggests that despite consumers' intention to purchase EVs, practical barriers such as infrastructure limitations, vehicle availability, and range anxiety prevent actual usage (Febransyah, 2021).

2. Indirect Effects

Turning to the indirect effects of various factors on use behavior through behavioral intention, the results were largely non-significant. The indirect effects of performance expectancy, effort expectancy, social influence, facilitating conditions, and price value on use behavior were all rejected, as their path coefficients and p-values indicated weak or no significant relationships (e.g., performance expectancy → behavioral intention → use behavior with a path coefficient of 0.003 and p-value of 0.750) (Table 3). These findings are consistent with studies like Maso & Balqiah (2022), who argue that while intention is a key driver of behavior, the actual usage of EVs is more influenced by external factors such as infrastructure, range, and price, which were not sufficiently addressed in the current study. Additionally, habit did not have a significant indirect effect on use behavior through behavioral intention (path coefficient = -0.074, p-value = 0.286) (Table 3), suggesting that habitual behavior may be more influential at the decision-making stage than in the actual use of the technology.

Managerial Implications

The findings of this study offer several managerial implications for encouraging electric vehicle (EV) adoption in Indonesia. First, the significant influence of hedonic motivation and habit on behavioral intention suggests that companies should emphasize the enjoyable and novel aspects of EVs in their promotional strategies. Marketing campaigns could highlight the futuristic design, driving experience, and technological features of EVs to attract consumers who are motivated by emotional and sensory experiences.

Moreover, the strong effect of habit indicates the need for strategies that can gradually shift consumer routines and preferences away from conventional vehicles. Businesses could consider offering extended test-drive programs, rental schemes, or experiential events to familiarize consumers with EVs and build new habits over time.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The findings indicate that electric vehicle (EV) adoption in Indonesia is more likely among younger, educated, urban residents who are open to new technologies and environmentally conscious. While a substantial proportion of respondents (59.57%) expressed interest in adopting EVs, most of the hypothesized factors performance expectancy, effort expectancy, social influence, facilitating conditions, price value, attitude, and perceived behavioral control were not found to significantly influence behavioral intention or usage behavior. Instead, hedonic motivation and habit emerged as the only variables with a significant positive effect on behavioral intention, suggesting that emotional appeal and existing behavioral patterns play a key role in shaping consumers' willingness to adopt EVs. However, the absence of a significant relationship between behavioral intention and actual use behavior highlights a gap between interest and real-world adoption. This implies that while emotional drivers may spark consumer interest, they are insufficient to overcome broader systemic and logistical barriers to EV usage in Indonesia. Furthermore, the demographic composition of the sample where only 0.87% of respondents were from rural areas limits the generalizability of the findings beyond urban contexts. Therefore, conclusions regarding infrastructure readiness or consumer behavior in rural areas should be made with caution and warrant further investigation.

Recommendations

To accelerate the expansion of the EV market in Indonesia, companies and policymakers should focus on demographic segments most responsive to adoption particularly younger, urban, and educated individuals. Marketing strategies should highlight the hedonic value of EVs, such as the enjoyment, novelty, and lifestyle benefits associated with EV ownership, which were shown to significantly influence behavioral intention. Given the strong influence of habitual use of conventional vehicles, interventions should be designed to reduce resistance to behavioral change. Such efforts could include offering test drives, trial programs, or experiential campaigns that allow consumers to engage with EVs in a low-risk and accessible manner. These strategies may help bridge the gap between interest and adoption by familiarizing consumers with EV technology and reducing uncertainty associated with behavioral transitions.

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