Customer Attitude Towards Car Sharing, Electric Vehicles and Autonomous Driving: Evidence from Indonesia

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Abstract

Electric vehicle (EV) and autonomous vehicle (AV) technologies have made significant strides and are anticipated to play a substantial part in the future transportation system. Little research has concentrated on the public's perception of autonomous electric cars (AEVs), while some has examined the potential effects of AEVs. This research employs the Technology Acceptance Model to investigate the general public's perceptions of AEVs. This study examines the impact of environmental concern on people's perceptions of AEVs, taking into account the potential environmental benefits of AEVs. An online survey in Indonesia was used to gather the information, which was then analysed using a structural model. Data was collected from the car and heavy bikes community of 370 customers. The findings indicate that people's intentions to use AEVs are positively related to their perceptions of green perceived usefulness, perceived ease of use, and environmental concern. Environmental concerns, mediated by various factors, have a significant indirect effect on usage intention. The research presents an in-depth framework for analysing consumer attitudes toward autonomous electric vehicles and environmental concerns. The study also recommends a future research agenda in the domains of consumer electric car and car sharing, which relate to social class and gender.

Keywords: Autonomous Electric Vehicles, TAM, Green Perceived Usefulness, Environmental Consideration.

Introduction

In recent years, the transportation industry has undergone significant development due to technological advancements and the growing demand for eco-friendly transportation. The environmental concern also pushed the automation sector to develop innovative ideas that match customer expectations and demand. As carbon gas emissions remain a global challenge, the transportation industry alone consumes 19-25% of energy and accounts for nearly a quarter of global carbon emissions (Bathla et al., 2024; Thurner et al., 2022). Reducing carbon gas emissions, customer awareness of individual ownership of combustion cars is associated with several health problems, including city congestion, loss of common space, air pollution, and CO2 emissions (Martin et al., 2011). Charging stations, government regulations regarding carbon emissions, subsidies, and other incentives (such as free charging, first-come, first-served parking, or access to environmental zones) have all contributed to the market's growth (Hoen & Koetse, 2014; Hackbarth & Madlener, 2013). There is a wide variety of solutions to

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enhance transportation, ignited by pressing environmental concerns, changing consumer values, and government policies. Private transportation technologies aim to introduce new modes of mobility, while also attempting to enhance the infrastructure accordingly. Literature suggests that autonomous cars have an important gap in terms of sustainability (Atakishiyev et al., 2024; Müller et al., 2019). Advances in battery and engine technology are crucial for electric vehicles, which are increasingly competing with internal combustion engines. They produce lower noise emissions and higher accelerations (Firnkorn et al., 2011), their greatest strength (Rayle et al., 2016). A significant increase has facilitated growth in charging stations, caps on carbon emissions, subsidies, and other inducements (like free charging, green parking lots, or green zones entry) (Baptista et al., 2014). Contributing to making this a reality are the steep declines in battery costs, the expansion of charging infrastructure, and the growth of environmentally conscious consumers (Clewlow, 2016).

Car sharing in Indonesia has become increasingly popular and commonly used in metropolitan cities such as Jakarta, Surabaya, and Bandung. For instance, carsharing in Indonesia generated revenue of $65.22 million in 2024, with a corresponding increase in user penetration of approximately 0.04%. The nation's carsharing market volume is expected to increase by 5.12 per cent annually. Indeed, these changes can improve the transportation sector's efficiency, particularly in urban areas, as the number of household car owners and traffic congestion is reduced. Accordingly, Baptista et al. (2014) suggest that car sharing reduces the number of privately owned automobiles, the requirement for parking spaces in densely populated areas, and vehicle mileage. The greenhouse gas emissions since it became a paid service in 2007 (Martin & Shaheen, 2011). In addition, carsharing services enable consumers to benefit from owning a car without worrying about keeping one (Costain et al., 2012).

To achieve mass appeal and encourage car owners to relinquish their vehicles, low entry fees, year-round availability, and a substantial vehicle pool are necessary (Dias et al., 2017). Though revenues from carsharing solutions are anticipated to grow fivefold by 2025, these firms currently operate in financial distress (De Luca & others, 2015). A fantastic illustration of how to make the economy last is the recent merger of Car2go and DriveNow, the car-sharing services offered by Daimler and BMW. The technology underlying vehicle sharing mainly focuses on the infrastructure and software (such as applications) that make it simple to use. Carsharing and ride-sourcing services already utilise advanced technology, robust connectivity, and location-aware platforms. This is particularly true today, with convenient mobile phone applications allowing conventional car sharing to evolve into on-demand, door-to-door transportation. The drivers of autonomous vehicles (AVs) do not need to give them directions (Atakishiyev et al., 2024; Grigorescu et al., 2020). Instead, they utilise modern GPS and sensors. AVs are undoubtedly the most revolutionary form of transportation today (Grigorescu & colleagues, 2020; Howard & Dai, 2014; Paden & colleagues, 2016). Autonomous vehicles that utilise intelligent transportation methods will reduce traffic congestion and pollution, such as travelling in groups on land or selecting the least congested path. The primary benefit of self-driving automobiles is that they significantly increase road safety (Bathla et al., 2024; Grigorescu et al., 2020). Although the technology and software now in use are unsuitable for fully driverless vehicles, fully autonomous vehicles are anticipated to be available soon (Bathla et al., 2024; Badue et al., 2021). The above transportation innovations are crucial for developing a sustainable mobility system, enhancing living conditions, and reducing carbon emissions (Martin & Shaheen, 2011). They will likely collaborate to develop a fleet of electrified, subscription-based, self-driving cars. Using autonomous cars to convey passengers to their desired locations is the next step for urban transportation systems. Startups like Waymo are already pursuing this idea, and Tesla has created a similar model (Atakishiyev et al., 2024; Martin & Shaheen, 2011).

As stated by Bansal et al. (2016), the degree of public acceptance of the underlying technology will ensure these developments achieve the expected positive consequences. The Theory of Reasoned Action, as established by Fishbein and Ajzen in the 1970s and later refined by Davis in 1989, served as the basis for the Technology Acceptance Model. Therefore, a user's desire to utilise technology is influenced by how simple they perceive it to be, how valuable they perceive it to be, and how they feel about using it—the three influence one another (Davis, 1985). Additional studies have revealed additional normative or behavioural factors that affect one's propensity to use technology and past usage history (Venkatesh & Davis, 2000; Mathieson, 1991).

Integrating technology into service and product design is crucial for reducing costs, time spent, and improving efficiency. This study aims to determine customers' willingness to experiment with novel transportation concepts, which may be attributed to a general interest in science and technology, as well as a general curiosity about new things. The number of factors that extend beyond simple socio-demographic ones to explain attitudes has increased dramatically due to prior research. This increases the competition between technical and non-technical elements for consideration during the decision-making process. According to recent research, different cultures adopt technology at varying rates (Thurner et al., 2022). However, at the time, wealthy Western nations, particularly those in North America, were primarily responsible for the study (De Luca & Di Pace, 2015). This is unfortunate, as most of the world's population resides in developing countries. These possess fragile economies due to their low levels of individual income, outdated technology, and inadequate physical infrastructure for communication, transportation, and electricity generation (Bathla et al., 2024; Claussmann et al., 2019). The environment for inventions is therefore minimal. For instance, if a changeover from combustion engines to electric cars is not possible due to the power system. Industrialised nations have also promoted the use of electric vehicles by making purchases. These financial resources are nonexistent in emerging markets.

Studies of other technologies have shown that once a device is on the market and individuals become familiar with it, perceptions quickly change (Haris et al., 2025; Rolim et al., 2012; Sarwar et al., 2024). An example is driving an electric car, which positively changed impressions, particularly among female drivers. (Howard et al., 2014). Since there are few available modes of transport, we come back to a principle which measures acceptability relatively early on: the willingness to experiment with a novel mode of transport as an early and often critical signal of emerging user acceptability, unlike previous studies that used theories such as user adoption intention (Safdar et al., 2022).

Literature Review

Technological innovation is a key driver of human society's growth. The Technology Acceptance Model (TAM), a theory derived from the Theory of Reasoned Action (TRA), has been used in earlier studies on public response to new technology (Fishbein & Ajzen, 1975; Davis, 1989). TAM demonstrates how perceived usefulness and usability might alter a person's desire to act (1989; Davis et al.). TAM illustrates how perceived usability and usefulness could shift an individual's willingness to act (1989; Davis et al.). According to Davis, perceived usefulness refers to "how much people believe a particular system or technology will enhance overall job performance." The phrase "perceived ease of use" is defined as "how much people think operating a specific technology or system will not require any physical or mental effort" (Davis et al., 1989). TAM allows other variables to come into play because of the moderation by perceived ease of use and usefulness (Morris & Venkatesh, 2000). The Theory of Planned Behaviour (TPB), which predicts users' intentions based on attitudes, subjective norms, and perceived behaviour control, is another popular theory (Ajzen, 1991). Mathieson (1991) tested the use of TPB and TAM to predict users' intentions. He learned that although TAM measured

total happiness more accurately, the two theories were adequate in explaining intentions. TAM has undergone numerous modifications since its original conception. According to Venkatesh and Davis (2000), a newer version of the Technology Acceptance Model (TAM) incorporates subjective norm as an external variable. In contrast, the unified theory of acceptance and use of technology is a separate version that amalgamates a series of previous models of technology acceptance (Venkatesh et al., 2012). Modern technologies extensively use these models (Alam & others, 2014).

The Technology Acceptance Model and its related models have been utilised in several studies to gauge consumer perceptions of novel automotive technologies. TAM was employed by Park et al. (2014) to expand on the reasons why drivers accept automobile navigation systems. The appearance, hazard, and price of electric motorcycles in 2015 impacted consumers' intentions to purchase them. Choi and Ji (2015) examined how perceived usefulness and trust affected customers' adoption of automated electric vehicles using TAM. Moták et al. (2017) examined people's feelings about self-driving shuttles using TAM and TPB. They concluded that factors beyond those considered by TAM and TPB also have an impact on behaviour. The Unified Theory of Acceptance and Use of Technology, as utilised by Madigan et al. (2017), is employed to identify the factors influencing people's opinions on automated road transport systems. Most of these investigations are carried out in industrialised nations where the development of automated vehicles is further along. Given Indonesia's increasing need for transportation, it is valuable and crucial to understand the public's perception of the growth of automated vehicles.

Green Perceived Usefulness

The effect of perceived usefulness on intention has been studied extensively. These investigations discovered that external structures and circumstances influenced the effects of perceived usefulness. The impact of perceived usefulness on intention to use is typically significant and favourable in a straightforward model without any antecedent factors. Additionally, it can impact BI through attitude (S.-Y. Chen & Lu, 2016). Perceived usefulness has a significant, favourable impact on behavioural intention when TAM contains more antecedent variables, and perceived usefulness is impacted by external factors (Cheng & Huang, 2013).

Hypothesis 1: Green perceived usefulness has a positive effect on intention towards technology use.

Perceived Ease of Use

Perceived ease of use of a product measures how easy it is to use or comprehend. Individuals prefer using things that are easy to use and not too sophisticated (Davis, 1989). Unlike PU, which significantly impacts intention to use, perceived ease of use occasionally has little to no impact on intention to use (Chen, 2016a). Perceived ease of use has a significant impact on attitude and intention to use, according to Kaplan et al. (2017) and Park et al. (2014). A cause-and-effect connection between perceived ease of use and IU has also been demonstrated. This indicates that perceived usefulness influences intention to use both directly and indirectly, due to its moderating impact (Hsu et al., 2017).

Hypothesis 2: Perceived ease of use has a significant impact on the intention to use.

Hypothesis 3: Perceived ease of use has an impact on perceived usefulness

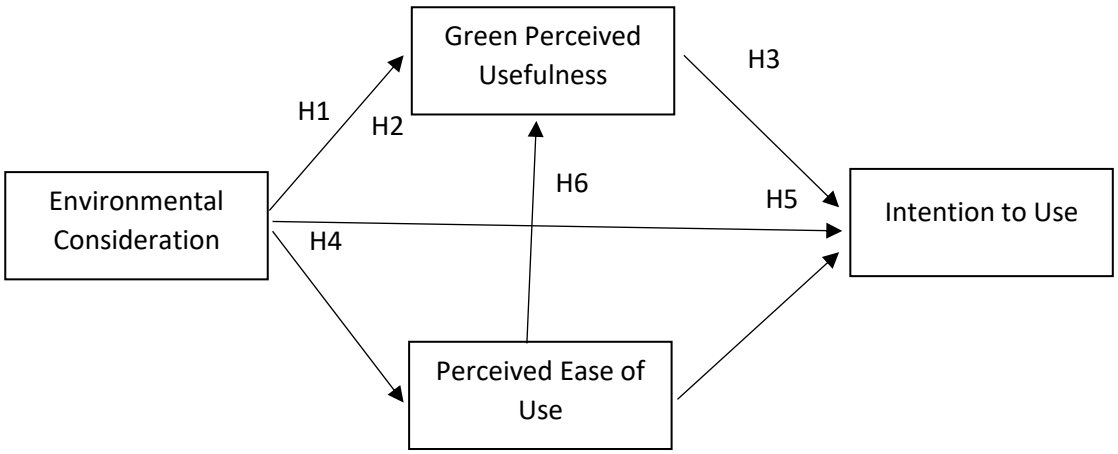
Environmental Considerations

People are becoming increasingly aware of the need to safeguard the environment as its condition worsens (Wang et al., 2017). Public awareness of environmental issues is correlated with environmental consideration (EC), which is evident in attitudes, awareness, and behaviours related to environmental problems (Weigel & Weigel, 1978). Previous studies have

shown that people's activities and attitudes toward the environment are positively correlated with their level of concern about the environment (Minton & Rose, 1997). Individuals with strong environmental concerns are more likely to contribute to environmental causes and purchase environmentally friendly products (Greaves et al., 2013; Ha & Janda, 2012; Talha et al., 2025). Maniatis (2016) concluded that individuals will care more about the environment if they purchase green products. Numerous studies have demonstrated that consumers' opinions and inclinations to purchase environmentally friendly goods, including new energy vehicles, are significantly influenced by their environmental concerns (Ozaki & Sevastyanova, 2011; Sarwar et al., 2025; Wang et al., 2017). Because they replace the oil-based transportation system, improve traffic flow, decrease the number of private cars on the road, and lower air pollution, automated electric vehicles play a significant role in transitioning to a more sustainable transportation system (Anderson et al., 2014). Therefore, those concerned about the environment will favour automated electric vehicles and be more likely to use them regularly. Thus, we put up the following hypotheses:

Hypothesis 4: Environmental consideration has an impact on intention to use.
Hypothesis 5: Environmental considerations have an impact on perceived green usefulness.
Hypothesis 6: Environmental consideration has an impact on perceived ease of use.

Figure 1: Conceptual framework



Methodology

The sample of the study comprises 370 car-owner customers who are better positioned to describe the attitude in car sharing. We selected two car service providers i.e., Fortuner Car and Harley Davidson bike communities. The questionnaire was sent to a WhatsApp group with 400 people in East Java and Kalimantan province. This approach is consistent with Poortvliet et al. (2019) wherein the willingness to participate in the group was obtained with stating the objective of the study to the potential respondents. We applied the notion of "willingness to try" to all three transportation technologies because integrating all three notions into one service forms future phase (electric vehicles, carsharing, and autonomous cars). We employed convenient sampling technique which is best suited to the nature of our research. The sample mainly contained respondent from all age brackets to capture the phenomena without bias. As per the statistics in table 1, most of respondents belong to middle or upper middle age groups. Further the sample is dominated by male due to inherent characteristics of Indonesian male dominant society in the automobile market. Our sample is diverse in respondents education wherein half of the sample belong to educated and half non-educated respondents. Further sample characteristics can be seen in the table given below (see table 1).

Following Thurner et al., (2022) we adopted positivism approach to reach the conclusion. The value of this inquiry lies in the claim that it makes sense to employ psychological measures to research and comprehend the public interest in evolving technologies because consumers are so attached to them. In order to protect the environment, customers are more likely to adopt technology-based vehicles. To collect the data, we adopted scales from the reliable sources and investigated their quality following Ryu & Jang (2006). The responses were obtained from respondets on seven point Linket scales based on statements wherein they were supposed to provide their opinion in level of agreement or disagreement.

Notwithstanding some alterations in this research, every element was taken from prior studies (Table 2). Green perceived usefulness borrows concepts from Chen (2016b), who switched from PU to GPU after reflecting on how environmentally friendly products are. Several car research studies and TAM's general concepts are the basis for usage perception and its associated intention (Davis, 1989). To demonstrate how respondents feel and are informed about environmental issues, we employ EC adapted from Ha & Janda, (2012). It was also adopted in other studies such as Kim and Choi (2005) and Shi et al. (2017). We employed complicated "structural equation modelling (SEM)" which is often used in social science to ascertain how latent variables and observable indicators relate to one another. According to Gefen et al. (2000) and Ullman and Bentler (2012), it is notably helpful in understanding how hidden variables relate to one another. SEM has already been used to analyze environmentally conscious consumer behavior (Maniatis, 2016). Due to their limited usage, many elements of AEVs cannot yet be directly observed; nonetheless, SEM is applicable to explore the relationship between other variables and behavioral intention (Shaukat et al., 2024). In SmartPLS 3.0, the measurement model was analyzed using maximum likelihood estimation (MLE), and the structural model was validated using route analysis (Anderson & Gerbing, 1988; O'Rourke & Hatcher, 2013). Our findings indicate that PLS has a higher value than LM. PLS's predicted value is hence appropriate for this study.

The data was passed through certain validity tests i.e., convergent and discriminant validity in measurement model analysis phases (Table 3). The discriminant validity assumes that if items are different they must have statistical heterogeneity (Sarwar et al., 2023). For this the question is asked about how different constructions are from each other internally, and if they can be differentiated. Conversely, convergent validity is assessed when the internal consistency of the items used to measure the same construct is questioned (Bagozzi et al., 1991; Ping Jr., 1996). We have applied a confirmatory factor analysis in order to establish the convergent and discriminant properties of validity (CFA). To test the reliability of instrument, Cronbach's alpha was also employed in testing the internal consistency of the structures. Its range ranged between 0.870 and 0.895, beyond the suggested minimum of 0.7 and with high internal reliability (Nunnally, 1978). Every construct built has a composite dependability that is larger than 0.912 and less than 0.927, based on inner model outcome, which are displayed in Table 4.The convergent validity was tested through Average Variance Extracted technique wherein the benchmark value was kept as 0.5. The value exceeding the benchmark justifies the prevalence of convergent validity (Gulzar et al., 2024). Furthermore, each of the constructs' discriminant validity is plausible from Table 5. A discriminant can be applied in this research to distinguish between the two, as the square root of AVE of the GPU (0.870) is higher than the Pearson correlation between the GPU and EC (0.717).

Table 1: Descriptive Statistics of Sample

Characteristics	Attributes	N	%
Age (in years)	Below 25	57	15.3
	26-30	54	14.5
	31-35	51	13.7
	36-40	75	20.2
	40 Above	133	35.9
Gender	Female	11	2.97
	Male	359	97.0
Education	No Education	11	2.9
	Primary level	51	26.4
	Secondary Education	43	13.7
	Higher Secondary	72	19.4
	Graduation(S1)	193	52.1
Profession	Job	285	77.0
	Business / self-employed	73	19.7
	No Profession	12	3.2
Income (IDR/m)	Up to 3000	75	20.2
	30001-60000	51	13.7
	60001-90000	124	33.5
	90001-120000	42	11.3
	Above 120000	78	21.0
Total		**370**	**100**

Note(s): N = 370; IDR/m = Indonesian Rupee per month

Results

First, we established whether the data were appropriate for CFA and initiated the diagnostic tests accordingly. Firstly we employed inner model analysis to check validity of the instrument (Table 1 and Table 2). Convergent validity investigates whether items applied to test a similar thought have internal consistency and how well they come together to tap the construct while discriminant validity determines the extent to which constructs are internally uncorrelated and the extent to which statistical test prove their heterogeneity (Bagozzi et al., 1991). Further, we performed a CFA test to establish the convergent and discriminant validity. The constructs' internal reliability was also assessed. The results were found supportive, falling within the recommended range of 0.7 and from 0.872 to 0.895 (Nunnally, 1978; Maminirina et al., 2022). Table 2 displays the measurement model's findings and the dependability of each construct. Each composite dependability is greater than 0.8. The structures' mean extracted variances (AVE) are between 0.678 and 0.760. We found that all constructs exhibit the AVE value greater than 0.5 (see table 2). The following three conditions meet the convergent validity requirements (Fornell & Larcker, 1981).

Table 2: Confirmatory Factor Analysis				
Constructs and Sources	**λ**	**α**	**CR**	**AVE**
Intention to Use (Davis, 1989; Park et al., 2014; Madigan et al., 2017)				
IU1: If AEVs are implemented, I intend to use them.	0.872	0.895	0.927	0.76
IU2: 'I would like to use it, assuming AEVs are used. usually,'	0.889			
IU3: If AEVs are implemented, I want to suggest it to others	0.872			
IU4: If AEVs are used, I would like to purchase them.	0.855			
Perceived Ease of Use (Davis, 1989; Madigan et al., 2017)				
PEOU1: Using AEVs would be easy.	0.847	0.872	0.912	0.722
PEOU2: AEVs would be easy to use.	0.819			
PEOU3: My communication with AEVs would be understandable.	0.87			
PEOU4: consider that returning an AVE is simple for me	0.863			
Environnemental Considération (Kim et al., 2005 ; Shi et al., 2017)				
EC 1: The current state of environmental pollution in Indonesia and its effects on public health are highly concerning to me.	0.83	0.881	0.913	0.678
EC 2: 'One of the primary sources of air pollution is automobile exhaust emissions.'	0.832			
EC 3: I am accountable for choosing a low-carbon form of transportation.	0.783			
EC 4: 'Haze pollution is the result of humanity severely abusing the environment.'	0.826			
EC 5: 'I am extremely worried about the state of Indonesia's haze Pollution and Its Implications for My Future.	0.845			
Green Purchase Usefulness (Davis, 1989; Chen, 2016a, 2016b)				
GPU 1: AEVs can enhance traffic quality.	0.876	0.893	0.926	0.757
GPU 2: AEVs will improve my health.	0.887			
GPU 3: Using AEVs can enhance environmental quality.	0.859			
GPU 4 I consider that using ARVs will make my living environment better	0.857			

As noted earlier, For discriminant validity, the value in the diagonal must be supervior than the values in associated rows and columns (Wynne, 1998; Haryanto et al., 2022). All discriminant validity for constructs that are worthy exists, as shown in Table 2. Since the square root of the AVE of the GPU (0.885) is higher than 0.692 (row) and 0.689 and 0.804 (column), it means that a discriminant can discriminate between the two in this research. Hence, our discriminant validity is established (see table 3).

Table 3: Discriminant Validity Results				
	1	**2**	**3**	**4**
Environmental Consideration-(EC)	**0.813**			
Green perceived usefulness-(GPU)	0.692	**0.885**		
Intention to use-(IU)	0.782	0.619	**0.872**	
Perceived Ease of Use-(PEOU)	0.710	0.832	0.538	**0.851**
Note: Authors' produced findings				

Hypothesis Testing

Subsequent to inner model analysis, we employed Outer model analysis for hypothesis testing. The structural model supports the validity of the theoretical frameworks we proposed, where

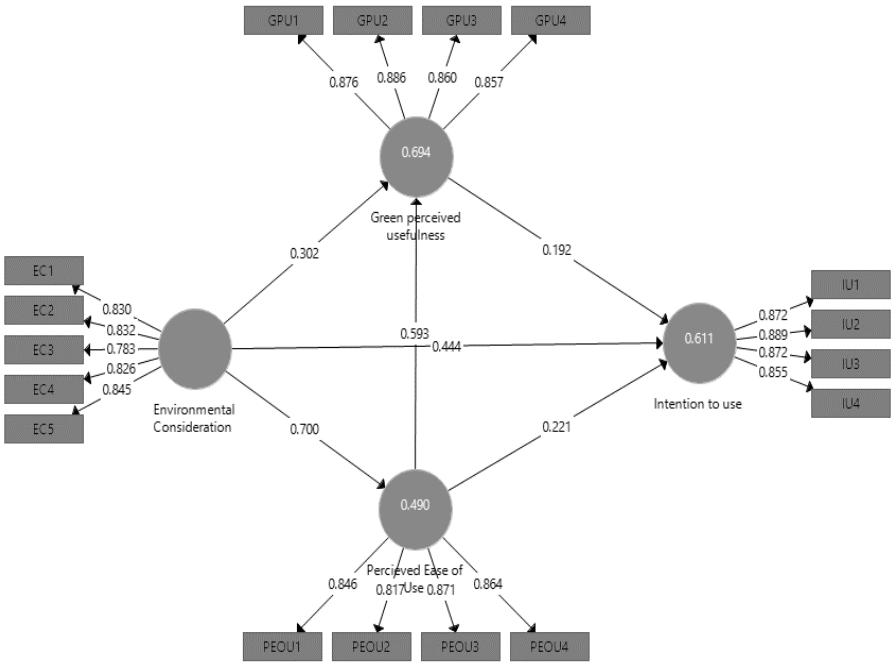
all coefficients are found supported at 1% significance level (Figure 4). According to which the results are deemed to be well-fitting. Furthermore, our structural equation modeling satisfies the model fit requirements. Another value is NFI, which should ideally be 0.9 but is 0.876 in our results instead.

The intentional drive to electric vehicles and green perceived usefulness are significantly associated, which supports the theory. This indicates that those who perceive knowledge as green do not intend to use it. This is consistent with the widespread desire to protect the environment. Perceived ease of use has a detrimental impact on the intention to use. Secondly, perceived ease of use significantly affects perceived usefulness, which proves GPU to have a direct effect on intention to use, in favor of Hypothesis 3. Logically, individuals' estimation of the value of going green could be enhanced when AEVs are easy to use with minimal or no effort physically or mentally. The effects exerted by the GPU are more pronounced than the perceived ease of use. Park et al. (2014) discovered that GPU and PEU have a favorable relationship with IU. Environmental concerns significantly impact IU, as Hypothesis 4 has demonstrated. More environmentally conscious people are more likely to use AEVs because they are more aware of their environmental impact and are more likely to take action.

Table 4: Hypothesis Testing

Hypothesis	B	STDV	t-Value	p-Value	R2	F2
EC > GPU	0.717	0.038	18.868	***	0.513	1.059
EC > IU	0.444	0.063	7.048	***	0.612	0.225
GPU > IU	0.192	0.07	2.743	0.007	***	0.029
PEOU > IU	0.222	0.074	3.000	0.003	***	0.041
EC > PEOU	0.071	0.032	2.219	***	0.489	0.958
PEOU > GPU	0.391	0.048	8.146	***		0.586

Figure 2: Structural Equation Results



Theoretical Implications

The findings enhance both technology acceptance and environmental behaviour theories by highlighting the influence of environmental considerations, perceived ease of use, and perceived green usefulness on individuals' intention to adopt AEVs. The results build on the TAM by demonstrating that green perceived usefulness has a more substantial impact on behavioural intention than perceived ease of use, suggesting that pro-environmental values strengthen the explanatory power of the TAM. Additionally, the significant and positive relationship between environmental concern and intention to use AEVs supports the theory that ecological awareness drives the adoption of green technologies, providing empirical evidence for integrating environmental psychology concepts with traditional technology adoption models.

Practical Implications

From a practical perspective, the findings indicate that policymakers and marketers looking to encourage AEV adoption should prioritise promoting the environmental and health benefits associated with these vehicles, as they have a more significant impact on behavioural intention than ease of use alone. Awareness campaigns and educational programs that emphasise the role of AEVs in reducing pollution and enhancing the quality of life can resonate with environmentally conscious consumers, boosting adoption rates. Furthermore, developers and manufacturers should ensure that AEVs are easy to use, which can indirectly improve perceptions of their usefulness. However, the primary marketing focus should be on highlighting tangible environmental and societal benefits to maximise engagement and support.

Conclusion

This study examines the acceptance of three novel transportation concepts: self-driving cars, car sharing, and electric vehicles. The current study thus adds new perspectives to the transportation literature, as previous studies have mainly focused on commercial decisions, governmental legislation, or both (Jang et al., 2018; Zhu et al., 2019). Our study was inspired by the urgent need to reduce CO2 emissions from personal transportation through the implementation of innovative technology and business practices. It is not easy to convince a substantial portion of the population to embrace new technologies, and it depends on various circumstances. According to one environmental study, Electric vehicle sales improve when duopoly-pricing analysis considers consumer heterogeneity (He et al., 2021). In choosing a method of transportation, individuals are more concerned with how it will impact their budget or how easy it will be to use than with its environmental harm, according to recent research (Münzel et al., 2019). Therefore, merely being "green" will not encourage the use of other modes of transportation. However, the development of socio-technological regime frameworks, comprised of scientific knowledge, engineering practices, new technologies, products, skills, and social statuses, and subsequently the essential ecosystem for a firm to thrive, depends on achieving a high customer acceptance rate. Businesses offer subsidies, and cost misquoting for battery-powered vehicles can be resolved (Chen & Fan, 2020). The results imply that Indonesian commuters prioritise travel and congestion times when selecting a form of transportation. According to research by Prasetio et al. (2019), public transit commuters appear to be more concerned about pollution, vibration, and noise levels compared to those using private transportation. This suggests that people's attitudes toward spending may be linked to environmental issues.

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