

BUYING INTENTION ON ELECTRIC CARS IN JABODETABEK USING COMBINED TAM AND TPB (C-TAM-TPB)

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Abstract: The use of motorized vehicles in Indonesia increasing from year to year. This has impacted higher air pollution. The use of electric cars was considered to reduce air pollution. However, the use of electric cars in Indonesia still experienced obstacles. This study aimed to analyze the factors that influenced people to buy electric cars in Jabodetabek through the integration/combination of TAM (Technology Acceptance Model) and TPB (Theory of Planned Behavior) or C-TAM-TPB, which were expanded by adding variables of Price Value, Perceived Risk, Environmental Awareness, and Infrastructure Barrier. There are 200 respondents participated in the study. They are selected using non-probability sampling with purposive sampling method. The data analysis technique used descriptive analysis and SEM PLS. The results of this study indicated that perceived usefulness and perceived ease of use had a positive influence on attitude. The variables attitude, perceived behavioural control, and price value had a positive influence on the intention to buy electric cars, while subjective norm, perceived risk, environmental awareness, and infrastructure barriers had no significant effect on the intention to buy electric cars.

Keywords: buying intention, C-TAM-TPB, electric car, infrastructure barriers

Abstrak: Penggunaan kendaraan bermotor di Indonesia selalu meningkat dari tahun ke tahun. Hal ini menyebabkan polusi udara semakin tinggi. Penggunaan mobil listrik dinilai dapat mengurangi polusi udara. Namun, penggunaan mobil listrik di Indonesia masih mengalami kendala. Penelitian ini bertujuan untuk menganalisis faktor-faktor yang mempengaruhi masyarakat membeli mobil listrik di Jabodetabek melalui integrasi/kombinasi TAM (Technology Acceptance Model) dan TPB (Theory of Planned Behavior) atau C-TAM-TPB yang diperluas dengan menambahkan variabel Price Value, Perceived Risk, Environmental Awareness, dan Infrastructure Barrier. Responden dalam penelitian ini sebanyak 200 responden. Teknik pengambilan sampel dilakukan dengan menggunakan non-probability sampling dengan metode purposive sampling. Teknik analisis data yang digunakan adalah analisis deskriptif dan SEM PLS. Hasil dari penelitian ini menunjukkan bahwa perceived usefulness dan perceived ease of use memiliki pengaruh positif terhadap attitude. Variabel attitude, perceived behavioral control, dan price value memiliki pengaruh positif terhadap niat beli mobil listrik, sedangkan subjective norm, perceived risk, environmental awareness, dan infrastructure barriers tidak memiliki pengaruh yang signifikan terhadap niat beli mobil listrik.

Kata kunci: C-TAM-TPB, niat pembelian, mobil elektrik, infrastructure barriers

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INTRODUCTION

As time goes by, technological development in the world is growing rapidly. One of the technological developments that is currently rife in the world is the automotive industry. Amid the threat of global warming and fossil energy scarcity, the automotive industry sector continues to innovate to make vehicles that are more environmentally friendly. Central Statistics Agency (BPS) reported the number of motorized vehicles in Indonesia continues to increase. In 2018 the number of motorized vehicles reached 126.5 million units, increase to 133.6 million units in 2019, and recorded at 136.1 million units in 2020. The increase in the number of motorized vehicles is also proportional to the increase in air pollution in Indonesia.

Environmental problems that occur are closely related to the problem of air pollution conditions (Maulana dan Haryanto, 2020). According to the World Air Quality Report 2022 data, Jakarta is the city with the worst air pollution in Indonesia. Jakarta's annual average PM2.5 concentration in 2022 reached 36.2 $\mu\text{g}/\text{m}^3$. WHO has categorized clean air as having a PM2.5 concentration classification in the air of 0-5 $\mu\text{g}/\text{m}^3$ (WHO 2021). Jakarta is one of the cities that has poor air conditions and can even be classified as very dangerous for health. Even as of June 16, 2022, the air quality in the city of Jakarta had become the second worst in the world with an index of 156, which means it is very dangerous for health.

Along with the environmental impact of the motorized vehicles, there's a hope in solving pollution problem by switching to electric-based vehicles (electric vehicle) such as electric cars. Electric cars are vehicles that use electrical energy as the main power to drive electric motors. Electric cars have several advantages over fossil fueled-based vehicles, one of which is that they do not produce exhaust gases so they do not contribute to global warming (carbon footprint) in Indonesia (Aziz et al. 2020). Switching the use of oil-fueled vehicles to electric vehicles is considered effective because it does not cause air pollution.

Association of the Indonesian Automotive Industry (Gaikindo) reported on electric car sales in Indonesia. There has been an increase in electric car sales in Indonesia from 2019 to 2022. In 2019 the number

of electric car sales reached 812 units, 1,324 units in 2020, 3,198 units in 2021, and 15,437 units in 2022. This shows that there is a positive trend in electric cars usage due to public interest in switching from fossil fuel vehicles to electric vehicles .

However, the use of electric cars still faces many obstacles. Many factors are considered by the public to switch from using oil-fueled motorized vehicles to using electric motorized vehicles. Before purchasing a new technology, there are various factors that are the reasons for adopting and using a new technology. Based on the background and phenomena described above, it is important to study factors that influence Buying Intention of electric cars.

This study examines the factors that influence the intention to buy an electric car in Jabodetabek. Previous research selected as a source of reference based on research related to the acceptance of electric cars among people in various countries using the Technology Acceptance Model (TAM) approach, Theory of Planned Behavior (TPB), and other variables that are close to this study. The Technology Acceptance Model (TAM) was first published by (Davis 1989). The public acceptability of new technologies was investigated using the Technology acceptability Model (TAM), which was evolved from the Theory of Reasoned Action (TRA) by (Fishbein dan Ajzen, 1975). According to TAM, perceived usefulness and perceived ease of use can influence one's behavioral intention (Davis, 1989). According to Davis (1989), perceived usefulness is defined as "the extent to which people believe that overall job performance can be improved by a particular system or technology," and perceived ease of use is "the extent to which people believe that using a particular system or technology could be free from physical and mental effort". The Theory of Plan Behavior (TPB) was first published by (Ajzen, 1991). This theory is one of the social psychology theories used to predict and understand human behavior. Theory of Planned Behavior (TPB) is a result of the development theory of the Theory of Reasoned Action (TRA) published by (Fishbein dan Ajzen, 1975). TPB is based on three main constructs that influence individual intentions to behave, namely attitudes, subjective norms, and behavioral control. Furthermore, individual intentions to behave will directly influence individuals in behaving.

To predict actual behavior, the TPB substitutes behavioral intention. Three constructs that are attitude, subjective norm, and perceived behavioral control can influence behavior intention (Ajzen, 1991). Different personal beliefs are accounted for by these three constructs. A subjective indicator of behavioral belief, attitude is primarily linked to the likely outcome of a particular behavior. The agreement of personal behavior with some societal reference groups is explained by the subjective norm. The phrase, which can be expressed in a variety of ways, is frequently referred to as social pressure or influence. A control belief that is influenced by the degree of difficulty or ease associated with particular behaviors is accounted for by perceived behavioral control.

The C-TAM-TPB method is a combined model of two decision-making theories, the Technology Acceptance Model (TAM) and the Theory of Planned Behavior (TPB), which were proposed by (Taylor and Todd, 1995). C-TAM-TPB can provide a better understanding of user behavior in using technology. In TAM theory only explains technological factors such as variables of perceived benefits and perceived convenience. Meanwhile, TPB explains psychological and environmental factors such as attitude variables, subjective norms and behavioral control. By combining these two theories, it is considered to be able to analyze technological factors and psychological factors that cannot be explained if only using TAM or TPB theory separately.

Based on previous research conducted towards intention of potential consumers to buy electric vehicles, there are additional variables used for the analysis including Price value, Perceived Risk, Environmental Awareness and Infrastructure Barrier. Price Value has a significant positive effect on the intention to purchase the electric vehicle (Zhang et al. 2020). Perceived Risk influenced consumers' intention to purchase electric vehicle (Asadi et al. 2021). Further, According to Choi and Ji (2015), Perceived Risk demonstrated the negative effect of behavioural intent, the more risk an individual perceived tends to reduce the intention to purchase. The electric vehicle demand is greatly influenced by the availability of workplace charging stations and the number of charging stations in public places (Jensen et al. 2013; She et al. 2017). Overall, the mentioned additional variables used in combined in C-TAM-TPB study (Vafaei-Zadeh et al. 2022) which shows price value and environmental self-image (awareness) all

positively impacted the intention, while perceived risk had a negative impact on intention, and Infrastructure Barrier has no meaningful relationship with intention.

The difference between this research and previous research lies in the object under study, the variable constructs used, and the scope of the research. Previous studies only used the TAM or TPB theoretical constructs. This study combines the two theories between TAM and TPB to have a better and more comprehensive understanding of the adoption of electric cars among the public. In addition, there are not many previous studies with a scope in Indonesia, especially Jabodetabek. The condition of Indonesia as a developing country is very different from other developed countries in terms of geography, culture, infrastructure, and living standards. Therefore, it is very important and timely to study what factors influence the purchase intention of electric vehicles among consumers.

METHODS

This type of research is quantitative research and is based on primary data and secondary data. The primary data used is in the form of questionnaire data given to respondents who already have a job and a fixed income, residents/currently residing in Jabodetabek, and have heard information about electric cars. This questionnaire was distributed within 2 months from February to April 2023. Meanwhile, the secondary data sourced from books, journals, previous research, official statistics from the government, and others. Secondary data in this study uses various theories regarding the Technology Acceptance Model, Theory of Planned Behavior, and acceptance of electric cars. The sampling technique used in the study used a type of non-probability sampling in the form of purposive sampling. Determination of the minimum sample size in this study uses the reference formula from Hair Jr et al. (2014), which is 5 times the number of research indicators. Our research has 31 indicator. The minimum number of samples was 155 respondents who were rounded up to 200 respondents. Characteristics of the respondents of this study, namely people who have a fixed income who live in the Jabodetabek area and know information about electric cars. This study uses four Likert measurement scales on a closed questionnaire. The operational variables in this study are listed in Figure 1.

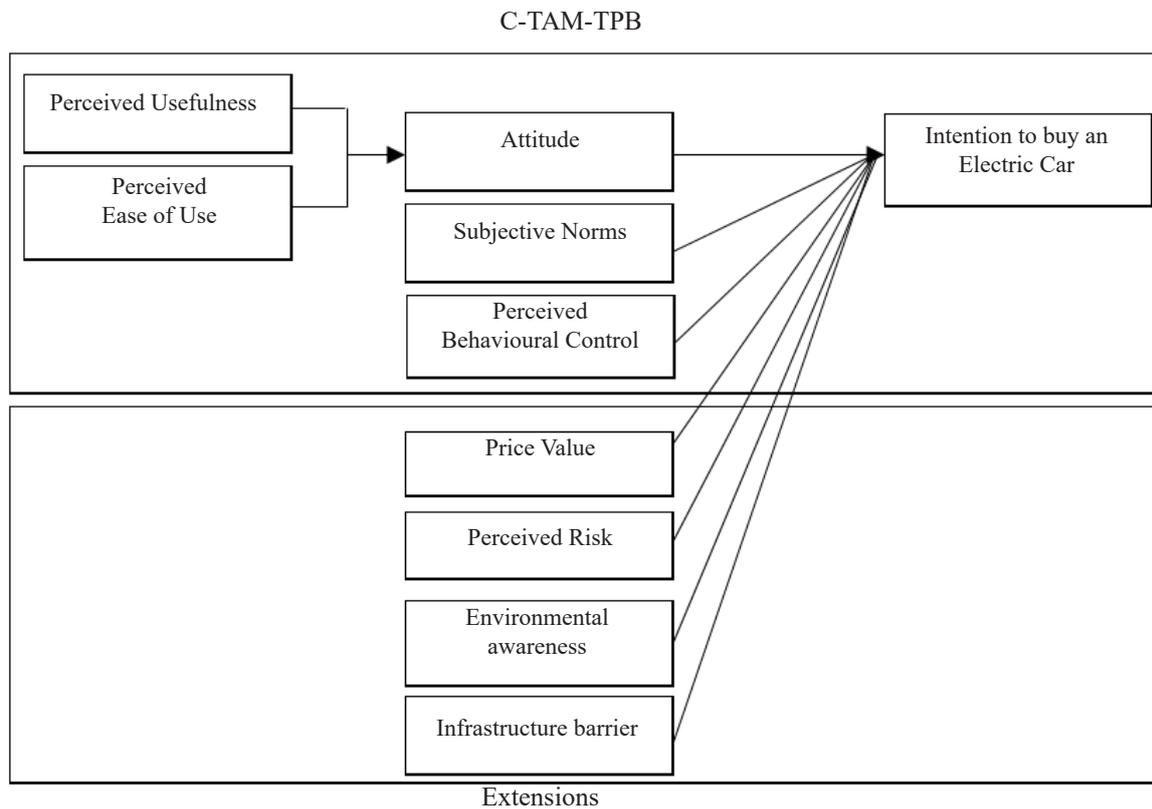


Figure 1. Research hypothesis

There are 9 hypotheses identified for conceptual framework test. The first part of hypothesis (hypothesis 1 to 5) are constructs developed from TAM and TPB theories. Further, additional variables to both theories were defined in hypothesis 6 to 9. Figure 1 display the hypothesis framerowk and were described as follows:

- H1: Perceived usefulness has a positive effect on attitude.
- H2: Perceived ease of use has a positive effect on attitude.
- H3: Attitude has a positive effect on the intention to buy an electric car
- H4: Subjective norms have a positive effect on the intention to buy an electric car
- H5: Perceived behavioural control has a positive effect on the intention to buy an electric car
- H6: Price value has a positive effect on the intention to buy an electric car
- H7: Perceived risk has a negative effect on the intention to buy an electric car.
- H8: Environmental awareness has a positive effect on the intention to buy an electric car
- H9: Infrastructure barrier has a negative effect on the intention to buy an electric car.

The variables and indicators that serve as a reference for the questions presented in the questionnaire are described in the Table 1. This research uses descriptive analysis and SEM-PLS analysis. The stages of analyzing and processing data obtained from the answers to the questionnaires that have been filled in by respondents are tested for validity and reliability with the help of SPSS (Statistical Package for Social Sciences) version 26 software, after which it is continued with a descriptive analysis that analyzes the characteristics of potential consumers of electric cars. Then the last stage, namely, Structural Equation Modeling - Partial Least Square (SEM-PLS) analysis to test the research hypothesis and analyze the influence between research variables. The SEM-PLS model consists of two models, namely (1) inner model, specifying the relationship between latent variables (structural model), and (2) outer model, specifying the relationship between latent variables and their indicators or manifest variables (measurement model).

Table 1. Measurement of variable

Variable	Indicator	Code	Source
Perceived Usefulness (PU)	Increase user productivity	PU 1	Choi & Ji (2015)
	Provides ease of driving	PU 2	
	Improve driving effectiveness.	PU 3	
Perceived Ease of Use (PEU)	Easy to learn	PEU 1	Venkatesh & Davis (2000); J. Wu et al. (2019)
	Features are easy to understand	PEU 2	
	Easy to use	PEU 3	
Attitude (ATT)	Belief that electric cars can reduce air pollution	ATT 1	Mohamed et al. (2018)
	Belief buying an electric car is a good decision	ATT 2	
	Belief owning an electric car is more cost-effective	ATT 3	
Subjective Norm (SN)	Social influence to buy an electric car	SN 1	Mohamed et al. (2018); Han et al. (2020); Asadi et al. (2021)
	Seeking advice from people closest to you before buying an electric car	SN 2	
	Advice from close people regarding environmental impact	SN 3	
Perceived Behavioural Control (PBC)	Having the necessary knowledge to use an electric car	PBC 1	Ajzen, (1991); Mohamed et al. (2018)
	Not worried about buying an electric car	PBC 2	
	No doubts about buying an electric car	PBC 3	
Price Value (PV)	Tax incentives provided by the government	PV 1	Zhang et al. (2020)
	The price of electric cars is proportional to the features offered	PV 2	
	Electric cars are more efficient in the long run	PV 3	
Perceived Risk (PR)	Electric car risk knowledge	PR 1	Choi & Ji, (2015)
	Comparison of risks of electric cars with conventional cars	PR 2	
	Consideration of risk factors before buying an electric car	PR 3	
Environmental Awareness (EA)	Contribution to the reduction of environmental pollution	EA 1	Mohd Suki (2019); Zhang et al. (2020)
	Reduces carbon emissions in the air	EA 2	
	Reduces the use of fossil fuels	EA 3	
	Proud to buy an electric car because it helps protect the environment	EA 4	
Infrastructure Barrier (IB)	Number of public charging station service availability	IB 1	She et al. (2017)
	Availability of repair shops and spare parts	IB 2	
	Electric vehicle charging speed at electric vehicle charging facilities	IB 3	
Intention to Buy (INT)	Interest in buying an electric car	INT 1	Mohamed et al. (2018); Semeijn et al. (2019)
	Electric car is the first choice	INT 2	
	Willing to tolerate some battery charging inconvenience	INT 3	

RESULTS

Respondent Characteristics

Respondents of this study are grouped into several categories. Based on the characteristics of the respondents presented in Table 2, it is known that the characteristics of respondents are dominated by male gender as much as 55%. Based on the age category, the majority of respondents fall into generation y or millennials in the age range of 29-42 years with a percentage of 59%. Meanwhile, based on the domicile category, the majority of respondents reside in the city of Jakarta with a percentage of 28% of the 200 respondents, the majority of respondents are private

employees (34%) with education being pursued/ last at the Bachelor level (61%) and have a monthly income of IDR 10,000,001 - IDR 15,000,000 (35%). In terms of four-wheeled vehicle ownership, the majority of respondents already own a four-wheeled vehicle personally with a percentage of 70%, followed by a family-owned four-wheeled vehicle with a percentage of 27% and the rest who do not own a four-wheeled vehicle with a percentage of 4%. The majority of respondents spend money for transportation needs per month with a nominal value of Rp 500,001 - Rp 1,000,000 (35%). In terms of frequency of transportation use per week, the majority of respondents use vehicles with a frequency of 4-5 days a week (47%).

Table 2. Characteristics of respondents

Characteristics	Category	Number	Percentage (%)
Gender	Male	110	55%
	Female	90	45%
Age (Years)	Gen Z (17–28)	66	33%
	Gen Y (29–42)	118	59%
	Gen X (43–58)	16	8%
	Boomer (>58)	0	0%
City of Domicile	Jakarta	55	28%
	Bogor	49	25%
	Depok	34	17%
	Tangerang	36	18%
	Bekasi	26	13%
Last / current education	Elementary School	0	0%
	Junior High School	0	0%
	Senior High School	14	7%
	Diploma	14	7%
	Bachelor (S1)	121	61%
	Magister (S2)	49	25%
	Doctor (S3)	2	1%
Job	Entrepreneur	43	22%
	Civil Servants	16	8%
	SOE Employee	36	18%
	Private employees	67	34%
	Doctors and health workers	18	9%
	Teacher/lecturer	13	7%
	Others	7	4%
Monthly income	≤ Rp5,000,000	21	11%
	Rp5,000,001 - Rp10,000,000	41	21%
	Rp10,000,001 - Rp15,000,000	70	35%
	Rp15,000,001 - Rp20,000,000	34	17%
	> Rp20,000,000	34	17%
Four-wheeled vehicle ownership	Personal	140	70%
	Family	53	27%
	Not yet owned	7	4%
Average spending on transportation per month	< Rp250,000	6	3%
	Rp250,001 - Rp500,000	23	12%
	Rp500,001 - Rp1,000,000	69	35%
	Rp1,000,001 - Rp1,500,000	51	26%
	> Rp1,500,000	51	26%
Frequency of transportation usage per week	1–3 day	22	11%
	4–5 day	94	47%
	6–7 day	84	42%

The three main reasons respondents want to buy an electric car are because it is environmentally friendly with a percentage of 64.5% followed by energy saving reasons with a percentage of 63.5% and reasons because of low electric car taxes with a percentage of 50%. Meanwhile, the three main reasons why respondents do not want to buy an electric car are because of the limited mileage of electric cars with a percentage of 63% followed by the reason that there are still few electric car battery charging stations with a percentage of 58.5% and the reason because the price of electric cars is quite expensive with a percentage of 57.5%. Based on the motivation and consideration for buying an electric car, the majority of respondents are interested in buying an electric car with a percentage of 70.5%.

The majority of respondents are interested in finding information about electric cars with a percentage of 97%. The majority of respondents get information about electric cars through the YouTube platform with a percentage of 57.5%, followed by the Instagram platform with a percentage of 51.5%. For website platforms and car exhibition events, they get the same number of responses, namely with a percentage of 48%. For electric car purchasing decisions based on information search factors, only 49% of the total respondents made electric cars their first choice when they wanted to buy a four-wheeled vehicle. As many as 44% of the total respondents have not made electric cars their first choice when they want to buy a four-wheeled vehicle.

Analysis of Factors Affecting Electric Car Purchases

Measurement Model (Outer Model) analysis results

Convergent validity test can be done by looking at the results of the loading factor value of each indicator. Indicators in the study can be declared valid if after calculating the path model the loading factor value ≥ 0.70 (greater than or equal to 0.70) and the resulting Average Variance Extracted (AVE) value > 0.50 (greater than 0.5). From Table 3, it can be seen that all outer loading values on each indicator have met the minimum requirements, which exceed 0.7 and have exceeded the minimum AVE value of 0.5. With this it can be stated that, all indicators and variables in this

study are considered valid based on the convergent validity test.

This reliability test is carried out with the aim of analyzing the reliability (consistency) of latent variables. According to Vinzi et al. (2010) the parameters of a variable in the study are declared to have good reliability if the Cronbach's alpha value and composite reliability value > 0.70 (greater than 0.7). From Table 2, it can be seen that all Cronbach's alpha values and composite reliability values have exceeded values above 0.70. It can be concluded that the latent variables in this study are declared reliable (consistent).

Figure 2, explained the correlation between indicators and variables used in the research. Perceived Usefulness and Perceived ease of used are positively correlated to the Attitude and further positively to Intention. Further, the Subjective Norm, Perceived Behavioral Control are also positively correlated to Intention. Additional variables including Perceived Risk, Environmental Awareness, and Infrastructure Barrier are positively correlated with the Intention.

Structural Model analysis results (Inner Model)

According to Sugiyono (2014) the R-square value is able to prove the percentage of influence between endogenous latent variables. The higher the value of R-square, the better the model can measure the proposed research model.

From Table 4, the R-square value of the dependent variable attitude gets a value of 0.683, which shows that the independent variables Perceived Usefulness and Perceived Ease of Use can explain 68.3% of the dependent variable attitude. While the remaining 31.7% is explained by other variables not examined in this study. Meanwhile, the calculation of the R-square value of the dependent variable intention to buy gets a value of 0.715, which shows that the independent variables Attitude, Subjective Norm, Perceived Behavioural Control, Price Value, Perceived Risk, Environmental Awareness, and Infrastructure Barrier can explain 71.5% of the dependent variable intention to buy. While the remaining 28.5% is explained by other variables not examined in this study.

Table 3. Measurement Model (Outer Model) analysis results

Variable	Item	Outer Loadings	Average variance extracted (AVE)	Cronbach's alpha	Composite Reability	Description
Perceived Usefulness (PU)	PU1	0.784	0.659	0.741	0.853	Valid & Reliable
	PU2	0.803				
	PU3	0.847				
Perceived Ease of Use (PEU)	PEU1	0.817	0.668	0.752	0.858	Valid & Reliable
	PEU2	0.820				
	PEU3	0.815				
Attitude (ATT)	ATT1	0.709	0.640	0.720	0.841	Valid & Reliable
	ATT2	0.813				
	ATT3	0.869				
Subjective Norm (SN)	SN1	0.790	0.655	0.737	0.850	Valid & Reliable
	SN2	0.793				
	SN3	0.844				
Perceived Behavioural Control (PBC)	PBC1	0.810	0.649	0.729	0.847	Valid & Reliable
	PBC2	0.780				
	PBC3	0.825				
Price Value (PV)	PV1	0.792	0.630	0.707	0.836	Valid & Reliable
	PV2	0.772				
	PV3	0.817				
Perceived Risk (PR)	PR1	0.851	0.628	0.704	0.835	Valid & Reliable
	PR2	0.760				
	PR3	0.763				
Environmental Awareness (EA)	EA1	0.821	0.657	0.825	0.884	Valid & Reliable
	EA2	0.756				
	EA3	0.821				
	EA4	0.840				
Infrastructure Barrier (IB)	IB1	0.819	0.668	0.752	0.858	Valid & Reliable
	IB2	0.792				
	IB3	0.841				
Intention to Buy (INT)	INT1	0.808	0.652	0.732	0.849	Valid & Reliable
	INT2	0.776				
	INT3	0.836				

Table 4. R² value (R-Square)

Dependent Variable	R ²
Attitude	0.683
Intention to Buy	0.715

Hypothesis test is run through the bootstrapping process. The calculation results can be seen in Table 5. The path coefficient result described the significancy of the hypothesis. It's found that 5 Hypotheses are accepted and 4 are not. The Perceived Usefulness and Perceived Ease of use are significant impact to Attitude. Attitude variable is significant impact to Intention to Buy. Similarly with Perceived Behavioral Control and Price Values are significant impact to Intention to Buy.

Perceive Usefulness (PU) variable has a positive effect on the Attitude (ATT). The positive perceptions related with the usability and benefits of electric vehicles have significant impact on the attitudes of potential customers. This supports that the rapid growth of electric vehicles as experienced by several producers in connection with the increase adoption from numbers of customers. This supports the hypothesis on the previous study which states that perceived benefits

have a positive and significant influence on attitudes regarding electric vehicles in country like China as also been identified to have growth in the electric vehicle customers (Wang et al. 2018; Wu et al. 2019).

On the other hand, Perceived Ease of Use (PEU) is also significantly relate with the Attitude (ATT). The hypothesis arises from the belief that the easier it is for potential consumers to use and manage electric vehicles, the more likely they will have a positive attitude towards these vehicles. This is supported by the previous research on PEU positive and significant influence on behavioral intentions as also experienced in China (Wu et al. 2019).

Semeiin et.al. (2019) has identified that attitude has a positive and significant influence on behavioral intentions to use environmentally friendly products. The same findings were defined also by Han et al. (2020) and Riptiono (2022). This study has also shown the positive and significant effect of Attitude (ATT) variable and Intention to Buy (INT) variable. The potential customers with a positive attitude towards the electric cars will have a tendency of adopting this technology in the future as they have intention to buy.

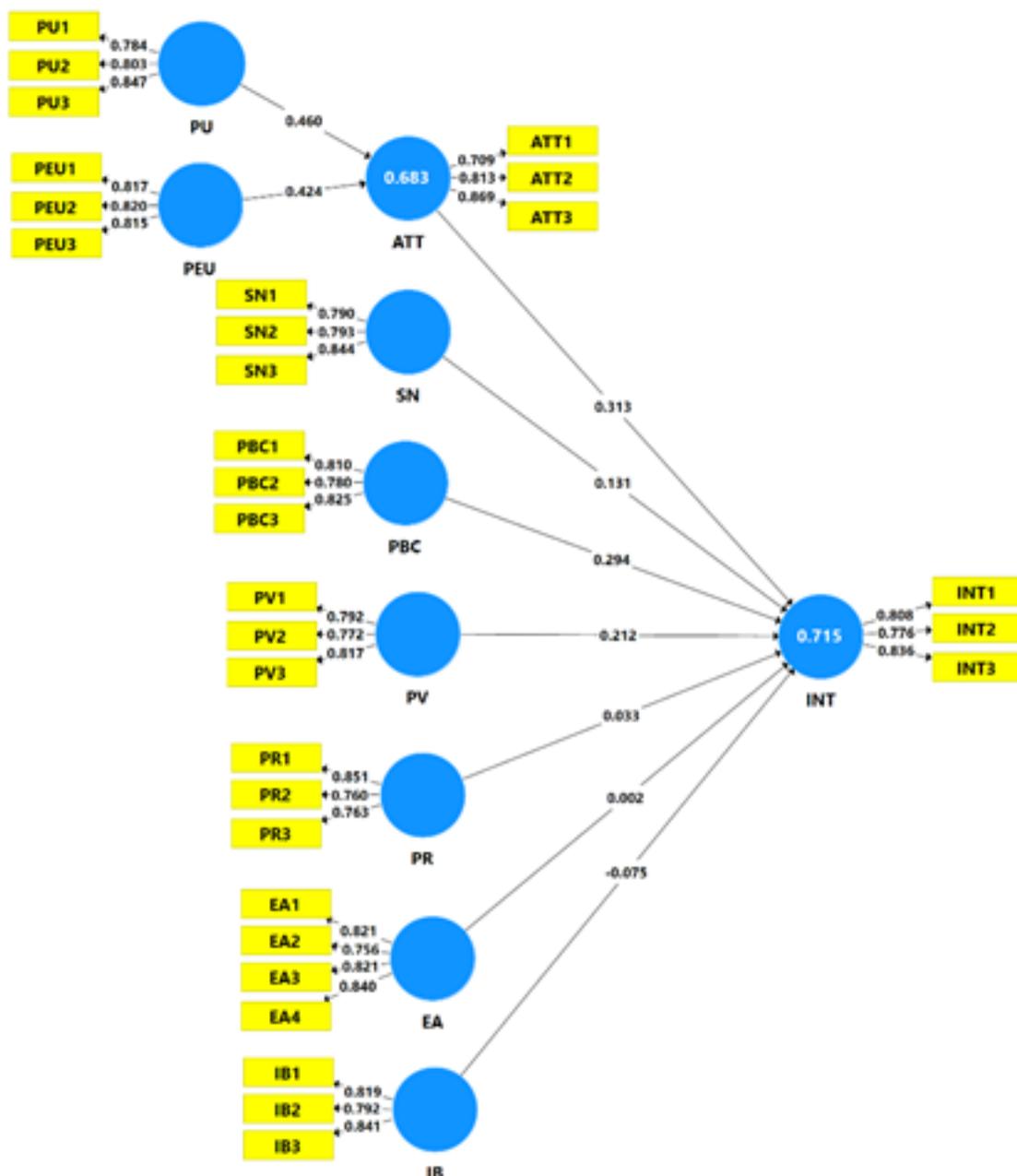


Figure 2. SEM Model C-TAM-TPB towards intention to buy EV

Table 5. Path coefficient value

Hypothesis	Original Sample	T-statistic	P-value	Description
H1: Perceived Usefulness (PU) → Attitude (ATT)	0.460	6.291	0.000	Accepted
H2: Perceived Ease of Use (PEU) → Attitude (ATT)	0.424	5.812	0.000	Accepted
H3: Attitude (ATT) → Intention to Buy (INT)	0.313	3.597	0.000	Accepted
H4: Subjective Norm (SN) → Intention to Buy (INT)	0.131	1.477	0.140	Rejected
H5: Perceived Behavioural Control (PBC) → Intention to Buy (INT)	0.294	3.505	0.000	Accepted
H6: Price Value (PV) → Intention to Buy (INT)	0.212	2.296	0.022	Accepted
H7: Perceived Risk (PR) → Intention to Buy (INT)	0.033	0.331	0.741	Rejected
H8: Environmental Awareness (EA) → Intention to Buy (INT)	0.002	0.027	0.978	Rejected
H9: Infrastructure Barrier (IB) → Intention to Buy (INT)	-0.075	0.824	0.410	Rejected

The relationship between the subjective norm (SN) variable and the intention to buy (INT) variable is insignificant. Which indicates that there is no positive effect of the relationship between subjective norm variables on intention to buy electric cars. The hypothesis that subjective norms, i.e. an individual's view or opinion regarding what is considered a social norm or expectation related to the purchase of an electric car, will not have a significant influence on potential consumers' intention to purchase an electric car. Subjective norms include opinions that may be given by family, friends, or other social environments regarding vehicle purchase policies. Thus, the subjective norm hypothesis does not affect the intention to buy an electric car in Jabodetabek. The results of proving this hypothesis are in accordance with previous research conducted by (Mohiuddin et al. 2018; Tanwir & Hamzah, 2020) which states that subjective norms do not have a significant effect on purchasing decisions for environmentally friendly cars in Malaysia.

Perceived behavioral control (PBC) variable and the intention to buy (INT) variable variable is significantly related. Further the Perceived behavioral control variable has a positive effect towards intention to buy. Perceived behavioral control reflects the level of individual confidence in their ability to overcome any obstacles or challenges that may arise in using an electric car. Furthermore, the higher the level of perceived behavioral control, the more likely a person will have a strong intention to buy an electric car. This is because a strong perception of control can affect individuals' perceptions of the ease of use of electric cars, the resolution of problems that may arise, and their ability to overcome various obstacles associated with the adoption of new technology. The results of proving this hypothesis are in line with previous research conducted by (Semeijn et al. 2019; Han et al. 2020) which states that perceived behavioral control

has a positive and significant influence on the intention to buy and use environmentally friendly products.

The results of proving this hypothesis are in accordance with previous research conducted by (Singh et al. 2023) which states that price value has a positive and significant effect on purchase intentions and switching to electric vehicles in India. Singh et al. (2023) studied that price value has a positive effect on purchase intentions and switching to electricThe relationship between the price value (PV) variable and the intention to buy (INT) variable is significant. Which means that the price value variable has a positive effect. The more positive the perceived price value is for potential customers, the more likely they will have a strong intention to purchase an electric car. This is because electric vehicles can often provide better long-term financial benefits compared to conventional fossil fuel vehicles. With lower running costs, less dependence on fossil fuels, and tax incentives that may be available, electric cars can be considered an economically favorable option.

The relationship between the perceived risk (PR) variable and the intention to buy (INT) variable is insignificant. There is no negative effect of the relationship between perceived risk variables on intention to buy electric cars. While perceived risk is an important factor in purchasing decisions, electric vehicles have undergone significant development in recent years. Advances in battery technology, expansion of charging infrastructure, and improvements in vehicle performance have reduced most of the risks that potential customers may be concerned about. The results of proving this hypothesis are in accordance with previous research conducted by Simsekoglu & Nayum, (2019) which states that understanding of risk does not significantly affect the intention to buy a battery-powered car (BEV) in Norway.

The environmental awareness (EA) variable and the intention to buy (INT) variable relationship is insignificant. This indicates that there is no positive effect of the relationship between environmental awareness variables on intention to buy electric cars. Although environmental awareness is an important factor in changes in consumer behavior and the choice of sustainable vehicles, other factors, such as economic aspects, practicality and personal preferences, can also influence the purchase intention of electric vehicles. In addition, technological developments and increased availability of charging infrastructure have expanded consumer choices, so the choice of an electric car does not always have to be based on the level of environmental awareness. The results of proving this hypothesis are in line with previous research conducted by Zhang et al. (2020) which states that environmental awareness has no significant effect on consumer attitudes in purchasing energy-efficient equipment in China.

The relationship between the infrastructure barrier (IB) variable and the intention to buy (INT) variable is insignificant. This indicates that there is no negative effect of the relationship between infrastructure barrier variables on intention to buy electric cars. Although infrastructure barriers are an important factor in the adoption of electric vehicles, rapid progress in the development of charging infrastructure has largely reduced these obstacles. In recent years, many countries and companies have invested in building more extensive and accessible charging networks, which reduces the practical barriers to electric vehicle adoption. The results of proving this hypothesis are in line with previous research conducted by Vafaei-Zadeh et al. (2022) which states that infrastructure barriers do not significantly affect the intention to purchase electric vehicles in Malaysia.

Managerial Implications

Prospective consumers perceive that using an electric car can increase the effectiveness of driving. This shows that if an electric car manufacturer company wants to foster a good attitude of potential customers towards electric cars, it must be able to increase consumer awareness about the usefulness and convenience of the features of electric cars which can increase driving effectiveness. The form of activities that can be carried out by electric car manufacturer companies to increase public awareness about the usefulness of electric

cars is to conduct socialization about electric cars as a whole through education, campaigns, and others. In addition, electric car manufacturers can work with the Indonesian automotive association to strengthen marketing strategies by creating electric car-themed automotive exhibition events and providing test drive units so that potential customers can take the opportunity to experience firsthand the effectiveness of driving an electric car.

Electric car manufacturer companies can foster the purchase intention of potential customers for electric cars must be able to foster the confidence of potential customers that electric cars can be more cost-effective than conventional cars in the long run. Currently, the price of electric cars is still considered quite expensive due to limited production and distribution infrastructure. The government and electric car manufacturers are advised to invest in the construction of electric car factories in Indonesia. The construction of an electric car factory in Indonesia can be a solution to make the price of electric cars more affordable. This is also related to the fact that Indonesia is one of the largest nickel producers in the world, and nickel is one of the main raw materials used in making electric car batteries. With an electric car factory in Indonesia, the production of electric car batteries can be done in Indonesia so that the cost of battery production can be reduced and can reduce dependence on imports of raw materials from abroad. In the long run, this can help lower the price of electric cars and make them more affordable for Indonesians.

Electric car manufacturers must be able to convince potential customers not to hesitate when they want to buy an electric car. Electric car manufacturers are advised to be able to provide a clear and transparent warranty policy. Companies need to develop a clear and transparent warranty policy for electric car engines and batteries. This policy should include information on the warranty period, warranty coverage, claim procedures, and consumer rights and obligations. By providing a clear and transparent warranty policy, companies can provide a sense of security to potential customers and increase their trust in the product. In addition to providing a warranty, companies are also advised to provide strong after-sales services, including regular maintenance, repairs, and easily accessible spare parts. Demonstrating commitment to customer satisfaction through high-quality services will increase potential customers' confidence in purchasing an electric car.

Electric-based cars are claimed to reduce energy consumption by up to 80 percent compared to conventional cars that rely on fuel oil (BBM). To improve the energy efficiency of electric cars, companies are advised to conduct research and development on electric cars so that electric cars can be even more efficient. In the context of research and development, companies can explore various fields and aspects of electric cars, from battery technology to drive systems, and from design optimization to energy management systems. In addition, companies can also explore more efficient electric motor technologies and more advanced transmissions to maximize the conversion of electric energy into wheel motion.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The characteristics of respondents (prospective electric car consumers) in Jabodetabek are dominated by men aged 29–42 years (millennial/Gen Y), domiciled in the city of Jakarta, working as private employees, with the last/current education at the undergraduate level. The majority of respondents have an income of Rp10,000,000- Rp15,000,000 per month, with an average monthly transportation expenditure of Rp500,000 - Rp1,000,000. The majority of respondents already own a private car, with the frequency of using transportation per week as much as 4-5 days. The reason the majority of respondents want to buy an electric car is because it is environmentally friendly and the reason the majority of respondents have not bought an electric car is because the price of electric cars is quite expensive. The majority of respondents seek information about electric cars through YouTube media.

Based on the constructs of TAM theory, the variables perceived usefulness and perceived ease of use have a positive and significant effect on attitude variables. Based on the TPB theory construct, the attitude variable, and perceived behavioral control have a positive and significant effect on the latent variable intention to buy. Meanwhile, the subjective norm variable does not have a significant effect on the latent variable of intention to buy an electric car. Based on the other four variables added, the price value variable has a positive and significant effect on the latent variable of intention to buy intention to buy. Meanwhile, the variables

of perceived risk, environmental awareness, and infrastructure barriers do not have a significant effect on the latent variable of intention to buy an electric car.

Recommendations

For future research, it can expand the scope of research by adding other variables to this research model so as to enrich predictors to explain the variety of intention to buy variables. Given the growing features of electric vehicles, it is hoped that the factors that influence the decision to buy an electric vehicle can be further explored in future research. The scope of further research can be expanded to include outside the Jabodetabek area, especially big city areas such as Bandung, Semarang, Surabaya and others that have different demographic, psychographic, and sociocultural characteristics in order to get a broader picture so that the results are more representative and generalizable.

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