The Role of Digital Intelligence in Shaping Purchase Behavior for New Energy Vehicles: A Study in Bangkok

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Abstract

In the digital intelligence era, consumers' vehicle purchasing behavior is increasingly shaped by smart technologies and interactive information systems. This study investigates the determinants of purchase behavior toward New Energy Vehicles (NEVs) in Bangkok, Thailand—an emerging NEV market facing both opportunities and challenges. Drawing upon the Stimulus–Organism–Response (SOR) framework, this research integrates the Motivation–Opportunity–Ability (MOA) theory as external stimuli and the Technology Acceptance Model (TAM) as internal psychological processing mechanisms to construct a comprehensive model. Using a mixed-methods approach, the study first conducts in-depth interviews with 14 early NEV adopters to identify context-specific factors, followed by a quantitative survey of 443 respondents analyzed via Structural Equation Modeling (SEM). The findings reveal that consumer motivation and purchasing ability significantly enhance perceived usefulness and perceived ease of use, while reducing perceived risk. While market opportunity factors such as government incentives and charging infrastructure exert statistically significant effects, their overall influence is relatively limited compared to motivational and ability-based factors. Notably, digital intelligence features—such as autonomous driving, smart connectivity, and remote control—serve as powerful stimuli that elevate consumers' perceptions of NEV utility, particularly among younger, tech-oriented users. From a practical standpoint, the study recommends that policymakers strengthen purchase incentives and directly address perceived

risks through extended government-backed battery warranty programs and transparent service guarantees. These strategies can reduce uncertainty and accelerate NEV adoption. The study contributes to the literature by extending the SOR framework to include digital intelligence as a novel stimulus in shaping consumer cognition and behavior in the NEV sector.

Keyword: New Energy Vehicles (NEVs), Consumer Purchase Behavior, Digital Intelligence

Introduction

In recent years, the global market for New Energy Vehicles (NEVs) has continued to experience rapid growth, primarily driven by government policy support, technological advancements, and increasing consumer awareness of environmental protection. According to the International Energy Agency (IEA, 2024), global electric vehicle (EV) sales reached nearly 14 million units in 2023, an increase of approximately 3.5 million units compared to 2022, representing a year-on-year growth of 35%. This surge has brought the total global EV stock to 40 million units. China, Europe, and the United States remain the dominant markets in this sector. However, in Southeast Asia, the NEV market has been developing at a relatively slower pace and is still in its early growth stage (Agency, 2024).As a key hub for the automotive industry in the region, Thailand has formulated a strategic plan for NEV development, aiming to have NEVs account for 30% of new car sales by 2030 (Sicheng, 2024). To promote NEV adoption, the Thai government has introduced various policies, including tax reductions, purchase subsidies, and investments in charging infrastructure. In particular, Bangkok has witnessed significant growth in NEV market demand in recent years, as the government actively accelerates its efforts to foster NEV adoption (Paudel et al., 2023). Nonetheless, compared to mature markets such as China and Europe, Thailand's NEV penetration rate remains relatively low. Moreover, consumer purchase behavior in the Thai NEV market has not yet been thoroughly examined, necessitating further research to enhance our understanding of the factors influencing consumer decisions.

In the "Digital Intelligence Era," digital and intelligent technologies are reshaping and influencing consumers' vehicle purchasing decisions (Hoyer et al., 2020). The smart technological features of New Energy Vehicles (NEVs), such as autonomous driving, intelligent connectivity, and remote control, have significantly altered consumers' purchasing criteria and preferences (Zhou et al., 2024). These advancements not only enhance

driving safety and convenience but also strengthen consumer interest and trust in NEVs (Abro et al., 2023). While social media and search engines have diversified the ways consumers access information, the intelligent attributes of NEVs have become a crucial factor influencing purchase behavior (André et al., 2018). Consumers are increasingly focusing on a vehicle's level of intelligence rather than solely considering traditional factors such as price, brand, and government subsidies. Therefore, examining the NEV purchase behavior of Bangkok consumers in the context of the Digital Intelligence Era is not only valuable for optimizing market promotion strategies but also holds significant academic importance in understanding the behavioral patterns of emerging market consumers amid technological transformations.

Research Objectives

1. To identify the characteristics of early adopters of new energy vehicles by analyzing their demographic and psychographic characteristics, including income, education, environmental awareness, and technology acceptance.

2. To evaluate the impact of digital smart technologies on purchase intention using quantitative analysis.

3. To examine the role of social factors such as government policies, group norms, information utility, and media publicity in influencing consumer decisions.

Literature Review

The global New Energy Vehicle (NEV) market has experienced rapid growth over the past decade, driven by government policy support, technological advancements, and increasing consumer awareness of environmental protection (Tian et al., 2024). In Southeast Asia, particularly in Thailand, the promotion of NEVs is at a critical stage. The Thai government has been facilitating NEV adoption through tax incentives, subsidy policies, and infrastructure development (Sundararjun & Wongbandit, 2021). However, despite these efforts, the market is still emerging, and consumer behavior remains insufficiently explored (Secinaro et al., 2022). Existing research on NEV adoption identifies three broad categories of influencing factors: personal, situational, and product-related.

1. Personal Factors

Personal factors encompass psychological and demographic elements that strongly shape consumer decision-making. In the field of psychology, intention has long been recognized as a reliable

predictor of individual behavior (Fishbein & Ajzen, 1977). Building on this foundation, intention has also been emphasized as playing a central role in innovation adoption, as consumers' established preferences guide their decision to embrace new products (Arts et al., 2011). Extending this perspective, it has been found that once consumers identify products that align with their preferences and values, they are often willing to adopt them even at a higher price (Cai et al., 2019). These findings collectively highlight that personal attitudes and predispositions not only influence the likelihood of adoption but also affect consumers' willingness to make financial trade-offs in favor of products that resonate with their psychological needs.

2. Situational factors

Situational factors refer to external conditions that shape consumers' evaluation and eventual adoption of new energy vehicles. These include government policies, infrastructure availability, and broader market incentives. In particular, it has been emphasized that structural elements such as policy support, charging accessibility, and product affordability are critical in enabling adoption (Rezvani et al., 2015). Furthermore, situational determinants—such as infrastructure readiness and social context—have been found to interact with personal attitudes to influence behavioral outcomes (Singh et al., 2020). Collectively, these findings suggest that while situational factors provide the enabling environment for adoption, their effectiveness depends on the degree to which structural support aligns with consumer needs and market readiness.

3. Product-Related Factors

Product-related factors refer to the specific attributes of new energy vehicles that influence consumer evaluations and adoption decisions. Prior studies indicate that technological performance and price are central drivers of adoption intention (Xu et al., 2018). In addition, safety technologies such as collision warning, automatic emergency braking, blind-spot monitoring, and lane-keeping assistance significantly improve vehicle safety performance, which enhances consumer trust and satisfaction and thereby increases purchase intention. (Cicchino, 2022).

Prior studies show that NEV adoption is influenced by personal, situational, and product-related factors, but most research has examined these in isolation, overlooked the role of digital intelligence, and paid little attention to Southeast Asia, particularly Thailand. To address these gaps, this study develops an integrated framework combining the

Stimulus–Organism–Response (SOR) model, the Motivation–Opportunity–Ability (MOA) theory, and the Technology Acceptance Model (TAM). The following section elaborates this framework and derives the research hypotheses.

Research Hypothesis and Model Construction

1. Stimulus: Motivation, Opportunity, Ability

Within the Motivation–Opportunity–Ability (MOA) perspective, consumers' motivation significantly affects their perceived usefulness and perceived ease of use (Jing et al., 2016). At the same time, some studies have shown that the stronger the motivation of consumers for a certain behavior, the more likely their risk perception is to decrease, thereby increasing their willingness to take risks (Chengde & Yuwei, 2011). Therefore, this study proposes the following hypothesis:

H1: Consumer's motivation for purchasing new energy vehicles has positive effect to their perceived usefulness.

H2: Consumer's motivation for purchasing new energy vehicles has positive effect to their perceived ease of use.

H3: Consumers' motivation to purchase new energy vehicles reduces their perceived risk.

Opportunity refers to the objective favorable environment perceived by an individual to promote his specific behavior (Chen, 2013). The Thai government launched a series of measures to support the development of new energy vehicles between 2022 and 2024, aiming to promote industrial expansion, enhance local production capacity and promote the electrification transformation of the automotive industry. Existing literature shows that government support and incentive policies can promote consumer purchasing behavior (Li et al., 2021). Therefore, the study proposes:

H4: Consumers' perceived purchase opportunity positively influences perceived usefulness of new energy vehicles.

H5: Consumers' perceived purchase opportunity positively influences perceived ease of use of new energy vehicles.

H6: Consumers' perceived purchase opportunity help reduces perceived risks of new energy vehicles.

Ability refers to the subjective conditions that individuals need to perform specific behaviors, which is reflected in self-efficacy (Wang & Rong, 2011). Previous

studies have found that when consumers have higher knowledge levels, technical capabilities, and economic capabilities, they have higher perceived usefulness and ease of use of products, and lower perceived risks (Hung et al., 2011). Therefore, this study proposes:

H7: Consumers' purchasing ability of new energy vehicles has an effect on their perceived usefulness.

H8: Consumers' perceived purchasing ability positively affects the perceived ease of use of new energy vehicles.

H9: Consumers' purchasing ability of new energy vehicles negatively affects their perceived risk of new energy vehicles.

2. Organism: perceived usefulness, perceived ease of use, perceived risk

Perceived usefulness is the consumer's perception that a certain technology or product can improve their work or life efficiency. Existing studies have shown that perceived usefulness significantly affects consumers' purchasing attitude and willingness to buy, and plays an important mediating role between purchasing motivation, purchasing opportunity and purchasing behavior (Venkatesh & Davis, 1996), Therefore, this study proposes:

Ha1: Perceived usefulness plays a mediating role in the process of consumer purchase motivation and purchase intention.

Ha2: Perceived usefulness plays a mediating role in the process of consumer purchase opportunity and purchase intention.

Ha3: Perceived usefulness plays a mediating role in the process of consumer purchase ability and purchase intention.

Perceived Ease of Use is the consumer's perception of the difficulty of operating a technology or product. Previous studies have shown that the higher the perceived ease of use, the more likely consumers are to show a positive purchasing attitude and willingness (Gefen, 2003). Therefore, this study proposes:

Ha4: Perceived ease of use plays a mediating role in the process of consumer purchase motivation and purchase intention.

Ha5: Perceived ease of use plays a mediating role in the process of consumer purchase opportunity and purchase intention.

Ha6: Perceived ease of use plays a mediating role in the process of consumer purchase ability and purchase intention.

Perceived risk refers to consumers' concerns and worries about the possible negative consequences of purchasing

behavior. Previous studies have found that high perceived risk significantly reduces consumers' purchasing motivation and willingness (Featherman & Pavlou, 2003). Therefore, this study proposes:

Ha7: Perceived risk plays a mediating role in the process of consumer purchase motivation and purchase intention.

Ha8: Perceived risk plays a mediating role in the process of consumer purchase opportunity and purchase intention.

Ha9: Perceived risk plays a mediating role in the process of consumer purchase ability and purchase intention.

3. Response: Consumer Purchase intention

Consumer purchase intention refers to the subjective tendency of consumers to perform specific purchase behaviors. According to the Technology Acceptance Model (TAM), when consumers perceive that a product or technology has practical benefits and helps improve the quality of life, their purchase intention will be significantly improved (Davis, 1989; Venkatesh et al., 2003); at the same time, when consumers perceive that the product is easy to use and simple to operate, their acceptance of the product and purchase intention will also be improved (Gefen, 2003; Venkatesh et al., 2016),However, perceived risk will negatively affect consumers' purchase intention, that is, when consumers believe that the product has high uncertainty and potential negative consequences, their purchase intention will be significantly reduced (Featherman & Pavlou, 2003; Forsythe et al., 2006). Therefore, this study proposes the following hypotheses: Based on these studies, the following hypotheses are drawn:

H10: The perceived usefulness of new energy vehicles by consumers positively influences their purchase intention.

H11: The perceived ease of use of new energy vehicles positively influences consumers' purchase intention.

H12: The negative impact of consumers' perception of risks related to new energy vehicles on their purchase intention.

4. Model Construction

Based on the above research assumptions, the following conceptual framework is constructed under the S-O-R framework and on the basis of MOA theory and TAM model:

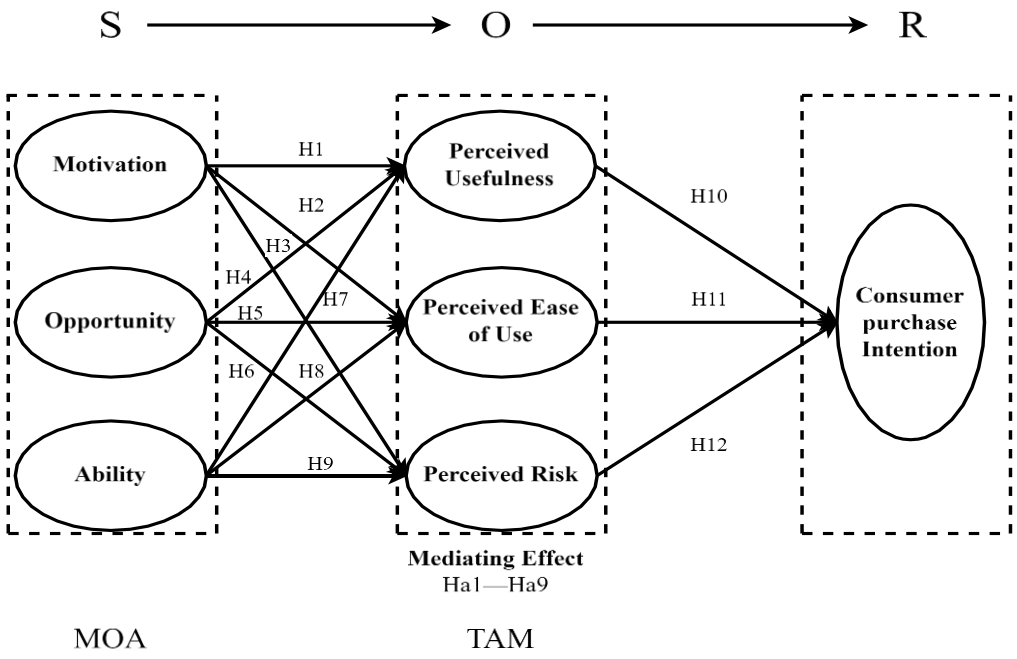

Figure1. Conceptual Framework

Research Methodology

This study employs a mixed-method design to combine exploratory depth with empirical rigor. In the first stage, qualitative research—including in-depth interviews, direct observation, and content analysis—was conducted to capture context-specific motivations and barriers faced by early NEV adopters in Bangkok. These insights were then used to identify key external stimuli (e.g., incentives, infrastructure, digital intelligence features) and organism-level variables (e.g., perceived usefulness, ease of use, risk) within the SOR framework. In the second stage, a structured questionnaire survey was administered, and structural equation modeling (SEM) was applied to test the hypothesized relationships. This sequential design ensures that the framework is both theoretically grounded and empirically validated.

1. Data Collection

This study uses a mixed method approach to collect data, including qualitative interviews and quantitative questionnaires. The first phase is a qualitative study, which collects subjective experiences and attitudes of early adopters of new energy vehicles (NEVs) in Bangkok, Thailand through open-ended in-depth interviews. The interviewees are all consumers who have purchased and used NEVs, have sufficient understanding and can clearly express their own experiences. This phase aims to identify the core drivers

of early adoption of NEVs and lay the foundation for subsequent research. The second phase is a quantitative study, using a questionnaire survey method. Based on the estimated population of Bangkok at the end of 2023 of about 10 million, this study uses the Yamane (1967) sample size calculation formula, with a 95% confidence level and a tolerance of 0.05 to determine the required sample size of about 400 people. Considering that the expected response rate of the questionnaire is about 50%, the actual number of questionnaires distributed is set to twice the calculated sample size, totaling about 800. The questionnaires were distributed through two channels: online and offline (selected NEV dealers in Bangkok) to ensure the representativeness of the sample and the diversity of the data. After screening and data cleaning, 443 valid questionnaires were finally obtained, which met the sampling requirements of the research design and ensured the reliability and validity of the analysis results.

2. Ethical considerations

This study strictly abides by academic ethics. During the implementation of the study, all respondents were clearly informed that the purpose of the study was purely academic and did not involve any commercial interests. At the same time, the researchers made a clear commitment to the respondents that all personal information and research data provided by them would be kept strictly confidential and would not be disclosed or leaked in any form. The data collection tools for this study include qualitative interviews and quantitative questionnaires. Among them, the content of the qualitative interviews mainly revolves around the research topic, covering multiple dimensions such as basic information of the respondents, user experience, policy support, future prospects, and summary of suggestions. The quantitative questionnaire adopts a structured design and contains seven parts. The first part is used to collect the demographic information of the respondents, including gender, age, education level, and educational background. The second part uses a Likert 7-point scale ranging from 1 (strongly agree) to 7 (strongly disagree) to evaluate the respondents' purchase motivation, purchase opportunity, purchasing ability, and perceived factors and purchase intention for new energy vehicles.

Analysis and Results

1. Qualitative research

This study collected nearly 30,000 words of interview records of new energy vehicle consumers, which were early adopters in Bangkok. In order to ensure the representativeness of the data and the scientific nature of the research, the researchers selected 14 interview records for grounded coding analysis, aiming to find out the core factors affecting the purchase behavior of new energy vehicles. In the coding process, this study strictly followed the grounded coding procedure proposed by Strauss and Corbin (1998) (Strauss & Corbin, 1998), using word-by-word analysis, concept extraction and category induction methods to ensure the reliability and validity of the research, laying the foundation for the subsequent model construction.

1.1 Open Coding

Open Coding, also known as primary coding, is the first step of grounded theory research. It aims to extract core concepts and make preliminary classifications through word-by-word decoding, conceptualization, and comparative analysis of original interview data. This study deleted overly simple or vague words, retained 588 core original sentences, extracted corresponding preliminary concepts, screened out high-frequency concepts with ≥3 repetitions, and eliminated concepts with less than 2 occurrences or containing contradictory information to ensure the accuracy and representativeness of the coding results.

Table 1 Open Coding Results of Early Adopters of New Energy Vehicles in Bangkok

Preliminary Concept	Example Quotes	Category
Brand Influence	"BYD has high brand value. I bought it not only because the car is good but also as a status symbol."	Brand Loyalty
Limited Government Subsidy	"The government doesn't offer much subsidy, so I bought an NEV mainly because I personally like it."	Policy Influence
Preference for Imported Models	"I am not very familiar with domestic brands, so I still trust international brands more."	Brand Loyalty
Insufficient Charging Infrastructure	"There are no charging stations near my home, so charging is not very convenient."	Infrastructure
Fuel Economy	"Fuel prices are too high, and NEVs are more economical."	Economic Consideration

Preliminary Concept	Example Quotes	Category
Smart Driving Experience	"I really like the smart driving system. It makes driving feel much easier."	Tech Interest
Ride-Hailing Driver's Purchase Decision	"NEVs are more economical than fuel cars, so as a taxi driver, I'm more willing to choose one."	Economic Consideration
Social Identity	"All my friends have started to pay attention to NEVs, so I want to try it too."	Social Identity
Range Anxiety	"There are fewer charging stations in Bangkok, so I'm concerned about range issues during long-distance driving."	Purchase Decision
Test Drive Experience	"During the test drive, I felt the handling was great, especially the acceleration performance, which is better than fuel vehicles."	Purchase Decision

Through open coding, this study extracted the key influencing factors of early adopters of new energy vehicles. Based on these preliminary findings, the next step of the study will enter the axial coding stage to further summarize and integrate the relationships between core categories and construct a characteristic model of early adopters of new energy vehicles.

1.2 Axial Coding

Axial coding, also known as second-level coding, involves axial landing or associative landing. The process of axial coding is a deep analysis of text categories, which helps confirm and develop the relationships between concepts, their characteristics, and dimensions. The main task is to discover the potential logical relationships between categories. After analyzing the relationships between each group of categories, the levels within the categories need to be identified, including the recognition of core and sub-categories. The relationship between the core and sub-categories is established through continuous comparative analysis. The process of forming the core categories (the axial coding process) is shown in Tables 2.

Table 2 Axial Coding Results of Early Adopters Of New Energy Vehicles in Bangkok

Core Category	Subcategory	Concepts
Policy-Driven	Import Tax Benefits	"The government provides some tax reductions for imported NEVs."
	Insufficient Policy Subsidy	"Government subsidies are limited, and it's mainly up to me to decide."
Economic Considerations	High Fuel Costs	"Fuel is expensive, and electric vehicles are more cost-effective."
	Maintenance Costs	"Maintaining an electric vehicle is cheaper than a fuel vehicle."
Technology Enthusiasm	Autonomous Driving	"BYD's autonomous driving feature really interests me."
	Smart Cabin	"The car system is very advanced, can connect with the phone, and feels very smart."
Brand Loyalty	Trust in International Brands	"I trust brands like Tesla and BYD."
	Low Acceptance of Domestic Brands	"Domestic NEV brands are not mature enough, so I don't trust them much."
Purchase Decision	Test Drive Experience	"After the test drive, I felt that NEVs are very quiet and have no noise."
	Range Anxiety	"There aren't enough charging stations in Bangkok, and I worry the battery won't last."
	Insufficient Charging Infrastructure	"There are too few public charging stations, so charging is inconvenient."

Through axial coding, this study summarized the five core categories of early adopters of new energy vehicles and their key influencing factors, and revealed the influencing factors in car purchasing decisions of consumers in Bangkok.

1.3 Selective Coding

On the basis of completing open coding and axial coding, this study further conducted selective coding and constructed a core characteristic model of early adopters of new energy vehicles. The main goal of selective coding is to integrate the relationship between different main categories around the core category and establish a logical framework for new energy vehicle consumer purchase decisions. The results are shown in Table 3 Selective coding process of early adopters of new energy vehicles in Bangkok.

Table 3 Selective Coding Results of Early Adopters of New Energy Vehicles in Bangkok

Category	Category	Subcategory	Key Influencing Factors	Mechanism of Influence on Consumer Purchase Decision
Purchase Decision	**Policy-Driven**	Government Subsidies	Government subsidies are relatively low	Limited impact on consumer purchase decisions
		Import Tax Benefits	Price reduction of imported NEVs	Attracts high-end consumers to choose international brands
	Economic Considerations	High Fuel Prices	NEVs have lower long-term costs compared to fuel vehicles	Encourages economy-conscious consumers to switch to NEVs
		Insufficient Charging Infrastructure	Few and unevenly distributed charging stations	Affects consumers' willingness to buy, causing some to abandon the purchase
	Technology Enthusiasm	Autonomous Driving Technology	BYD FSD (Full Self-Driving) is highly attractive	Increases interest among high-end tech-savvy consumers
		Smart Cabin	IoV and multi-screen interactive features attract younger consumers	Influences the market performance of high-end NEVs
	Brand Loyalty	Preference for International Brands	High recognition of brands like Tesla, Mercedes-Benz	Consumers in Bangkok are more likely to purchase imported NEVs
		Test Drive Experience	Driving quality and quietness influence final decisions	Enhances consumers' trust in NEVs

Through selective coding, this study constructed a logical framework for the car purchase decision of early adopters of new energy vehicles in Bangkok, namely: policy-driven, economic considerations, technological interests, brand loyalty, and charging facilities.

1.4 Qualitative research results

Based on in-depth interviews with early adopters of new energy vehicles in Bangkok, this study uses grounded theory analysis to extract five core influencing factors: policy drive, economic considerations, charging infrastructure, technology interest, and brand loyalty. It also finds that test drive experience has an important impact on the final decision. Overall, despite the rapid development of new energy vehicles worldwide, their promotion in the Bangkok market is still affected by multiple factors. Consumers' car purchase decisions involve many factors such as policy environment, economic considerations, infrastructure

conditions, and brand and technology preferences.

First, policy, economic and infrastructure factors play an important role in consumer decision-making. Although the Thai government provides import tax exemptions, the policy has a weak driving force on the market due to the lack of direct car purchase subsidies, resulting in a relatively low penetration rate of new energy vehicles. In terms of economy, high oil prices and lower maintenance costs make new energy vehicles more attractive to commuters and online car-hailing drivers. Although the purchase cost is high, the long-term economic benefits make up for this shortcoming. In addition, the lack of charging infrastructure has become a core issue of concern to consumers. The limited number of charging piles and uneven distribution, especially in non-city center areas, have led some potential consumers to give up buying new energy vehicles due to range anxiety. Secondly, technology and brand preferences have become important factors affecting the choices of high-end consumers. Intelligent functions such as autonomous driving and smart cockpits have increased the appeal of new energy vehicles, especially among young consumers and technology enthusiasts. At the same time, consumers in the Bangkok market are more inclined to choose international brands (such as Tesla and BYD), believing that these brands have mature technology and reliable quality, and are willing to pay a brand premium.

Overall, this study found that policy support is limited, economic efficiency is the main driving force, insufficient charging facilities restrict market development, technology attracts high-end users, brand affects market preferences, and test drive experience becomes a key factor in promoting purchases. These conclusions provide empirical references for government, enterprises and market strategies to promote the development of the Bangkok new energy vehicle market.

2. Quantitative Research

This study is based on the Bangkok new energy vehicle consumer survey data. A total of 800 questionnaires were distributed, and 443 valid questionnaires were finally collected, with an effective recovery rate of 55.38%, which met the expected data recovery rate standard.

2.1 Descriptive Statistical Analysis

In terms of gender, the proportion of female potential consumers of new energy vehicles in Bangkok is slightly higher than that of male, with females accounting for 53.95% and males accounting for 46.05%. The 24-45 age group is the main potential consumer of new energy vehicles, of which 24-35 years old account for

28.67%, 36-45 years old account for 34.77%, 18-24 years old account for 19.63%, 46-60 years old account for 16.93%, and there are no respondents over 65 years old. The income structure shows that the middle-income group accounts for a higher proportion, with the 430-1150 USD income group accounting for 41.76%, followed by the 1150-2300 USD group (34.31%), the low-income group (less than 430 USD) accounting for 20.09%, and the high-income group (more than 2300 USD) accounting for 3.84%, which is significantly lower than the Chengdu sample. In terms of education level, 57.1% of the people have a bachelor's degree or above, of which 35.89% have a bachelor's degree, 18.74% have a master's degree, and only 2.49% have a doctorate or above, while the proportion of high school and below education is 20.09%.

2.2 Data Normality Test

The skewness and kurtosis coefficients of most key variables—including new energy vehicle purchase intention, consumer motivation, opportunity, ability, perceived usefulness, perceived ease of use, and perceived risk—fell within the acceptable range of ±2, indicating that the data largely met the requirements of univariate normality. See Table 4.

Table 4 Normality Test Table for Bangkok Sample

Variable	Sub-dimension	Question Item	Kurtosis	Skewness
Motivation	Value Orientation	VO1	-0.543	-0.223
		VO2	-0.811	-0.332
	Consumption Preferences	CP1	-0.316	-0.24
		CP2	-0.703	-0.191
		CP3	-0.458	-0.105
	Personality Traits	PT1	-0.778	-0.174
		PT2	-0.977	-0.215
Opportunity	Policy support	PS1	0.869	-0.069
		PS2	0.976	0.109
		PS3	1.243	0.049
	Group norms	GN1	2.431	0.418
		GN2	1.576	0.277
	Information utility	IU1	1.918	0.306
		IU2	1.514	0.181
		IU3	1.206	0.236
	Media publicity	MP1	1.283	0.21
		MP2	1.15	0.442
		MP3	1.69	0.07

Variable	Sub-dimension	Question Item	Kurtosis	Skewness
Ability	Knowledge ability	KA1	0.8	-0.243
		KA2	-0.155	-0.149
		KA3	0.155	-0.354
	Economic ability	EA1	0.036	-0.303
		EA2	-0.006	-0.364
		EA3	-0.244	-0.192
	Technical ability	TA1	0.331	-0.404
		TA2	0.094	-0.398
Perceived Usefulness	Range Capability	RC1	0.427	0.499
		RC2	0.069	0.649
		RC3	0.134	0.645
	Economic Cost	EC1	0.324	0.432
		EC2	-0.139	0.459
	Digital Technology Function	DTF1	0.023	0.438
		DTF2	0.046	0.644
	Intelligent Technology Function	ITF1	-0.094	0.355
		ITF2	0.122	0.58
Perceived Ease of Use	Ease of Operation	EO1	-0.603	0.339
		EO2	-0.379	0.146
	Maintenance Convenience	MC1	-0.434	0.219
		MC2	-0.302	0.214
		MC3	-0.196	-0.148
	Service Support	SS1	-0.439	0.083
		SS2	0.119	-0.054
		SS3	-0.582	0.095
Perceived Risk	Economic Risk	ER1	-0.094	0.036
		ER2	-0.367	-0.079
	Technical Risk	TR1	-0.127	-0.106
		TR2	0.054	-0.178
		TR3	-0.184	-0.372
	Safety Risk	SR1	-0.303	-0.12
		SR2	0.254	-0.382
		SR3	-0.288	-0.222
consumer purchase behavior	CPI1		0.011	0.386
	CPI2		-0.685	-0.072
	CPI3		-0.609	0.013

The results show that the overall data distribution meets the normality assumption, with the absolute values of Skewness and Kurtosis for the vast majority of measurement items being less than 2. The data is still within an acceptable range and will not have a substantial impact on subsequent modeling analysis. Therefore, the data remains suitable for reliability and validity tests as well as SEM analysis.

2.3 Reliability and validity analysis

This study used Cronbach's **α**, composite reliability (CR) and average variance extracted (AVE) to evaluate the reliability and validity of the questionnaire. Among them, Cronbach's **α** and CR values measure internal consistency (CR > 0.7), and AVE evaluates convergent validity (AVE > 0.5). In addition, the discriminant validity test was performed based on the Fornell-Larcker criterion to ensure that the constructs have good discrimination. Reliability and validity analysis were conducted on the data of Chengdu and Bangkok respectively to ensure the reliability of subsequent SEM analysis, see Table 5 for details.

Table 5 Reliability and Validity Analysis for Bangkok

Variable	Sub-dimension	Question Item	F	C's **α**	AVE	CR
Motivation	Value Orientation	VO1	0.926	0.971	0.8625	0.9709
		VO2	0.924			
	Consumption Preferences	CP1	0.922			
		CP2	0.918			
		CP3	0.891			
	Personality Traits	PT1	0.888			
		PT2	0.894			
Opportunity	Policy support	PS1	0.922	0.942	0.6559	0.9541
		PS2	0.918			
		PS3	0.891			
	Group norms	GN1	0.758			
		GN2	0.769			
	Information utility	IU1	0.755			
		IU2	0.802			
		IU3	0.857			
	Media publicity	MP1	0.709			
		MP2	0.733			
		MP3	0.758			
Ability	Knowledge ability	KA1	0.876	0.949	0.7091	0.9512
		KA2	0.805			
		KA3	0.859			

Variable	Sub-dimension	Question Item	F	C's α	AVE	CR
	Economic ability	EA1	0.860			
		EA2	0.793			
		EA3	0.859			
	Technical ability	TA1	0.836			
		TA2	0.845			
Perceived Usefulness	Range Capability	RC1	0.903	0.955	0.7019	0.9548
		RC2	0.816			
		RC3	0.857			
	Economic Cost	EC1	0.879			
		EC2	0.816			
	Digital Technology Function	DTF1	0.76			
		DTF2	0.796			
	Intelligent Technology Function	ITF1	0.823			
		ITF2	0.88			
Perceived Ease of Use	Ease of Operation	EO1	0.877	0.944	0.6779	0.9438
		EO2	0.791			
	Maintenance Convenience	MC1	0.858			
		MC2	0.86			
		MC3	0.742			
	Service Support	SS1	0.814			
		SS2	0.793			
		SS3	0.843			
Perceived Risk	Economic Risk	ER1	0.909	0.956	0.7315	0.9561
		ER2	0.831			
	Technical Risk	TR1	0.880			
		TR2	0.868			
		TR3	0.796			
	Safety Risk	SR1	0.856			
		SR2	0.824			
		SR3	0.873			
consumer purchase behavior	CPI1		0.944	0.848	0.6407	0.8401
	CPI2		0.716			
	CPI3		0.72			

The data analysis results of Bangkok also showed that the Cronbach's α and CR values of all variables were greater than 0.9, indicating that the questionnaire had extremely high internal consistency and could reliably measure relevant variables. At the same time, the AVE values of all variables were above 0.65, which met the

standards of reliability and validity testing, indicating that the data of Bangkok also showed good convergent validity.

2.4 Discriminant Validity Analysis

This study uses the Fornell-Larcker criterion to evaluate discriminant validity to verify the independence of each latent variable and ensure that different constructs can measure different concepts. The discriminant validity test requires that the square root of the AVE of each latent variable should be greater than its correlation coefficient with other latent variables to prove that there is good discrimination between variables. In addition, this study also reports the mean (Mean) and standard deviation (SD) of each variable to provide more comprehensive descriptive statistical information. Detailed analysis is shown in Tables 6

Table 6 Discriminant Validity for Bangkok

	Mean	SD	MOA	OPT	ABT	PU	PEU	PR	CPB
MOA	5.1158	0.82306	0.9287						
OPT	5.0025	0.42879	0.394	0.8099					
ABT	4.7544	0.65024	0.313	0.496	0.8421				
PU	4.655	0.71928	0.536	0.418	0.546	0.8378			
PEU	4.7751	0.65451	0.449	0.444	0.548	0.57	0.8234		
PR	4.5955	0.68794	0.579	0.491	0.638	0.583	0.636	0.8553	
CPB	4.4836	0.79058	0.503	0.399	0.506	0.564	0.62	0.629	0.8004

The diagonal values represent the square root of the AVE (Average Variance Extracted) for the respective factor.

Overall, the measurement model for Bangkok's sample meets academic requirements for discriminant validity, indicating that the scale used can effectively differentiate between different latent variables. This provides a solid data foundation for subsequent Structural Equation Modeling (SEM) analysis.

2.5 Model Fit Assessment

Before conducting Structural Equation Modeling (SEM) analysis, it is necessary to assess the model's fit to ensure that the theoretical model can reasonably explain the observed data. Model fit is primarily evaluated using various fit indices, including: the chi-square to degrees of freedom ratio (χ^2/df), the Root Mean Square Error of Approximation (RMSEA), the Goodness of Fit Index (GFI), the Normalized Fit Index (NFI), the Tucker-Lewis Index (TLI), and the Comparative Fit Index (CFI). Typically, a χ^2/df less than 5, an RMSEA less than 0.08, and GFI, NFI, TLI, and CFI values greater than 0.90 indicate a good model fit.

The following section presents the Bangkok model's goodness-of-fit test results and analyzes and discusses the goodness-of-fit.

Table 7 Model Fit Indices for Bangkok

Index	Statistical Value	Fit Criterion	Result Interpretation
χ^2/df	2.657	< 5	Meets the standard, good model fit
RMSEA	0.062	< 0.08	Indicates a relatively good fit
GFI	0.902	> 0.90	Meets the standard, strong model fit
NFI	0.951	> 0.90	Meets the standard, good model fit
TLI	0.962	> 0.90	Meets the standard, high goodness of fit
CFI	0.969	> 0.90	Meets the standard, excellent model fit

Similarly, from the fit indices above, Table 7 shows that the overall fit of the Bangkok model is also good and meets the fit standards for academic research, indicating that the constructed model effectively reflects the structural relationships of new energy vehicle consumers' purchase intentions.

2.6 Path Coefficient Analysis

In the structural equation model (SEM) analysis, path coefficients are used to measure the direct influence relationship between variables and evaluate the support of research hypotheses. The size of the path coefficient and its significance level (p value) determine whether the relationship between variables is established. Generally speaking, the larger the path coefficient, the stronger the influence of the independent variable on the dependent variable, and a p value less than 0.05 indicates that the path relationship is statistically significant.

Through path analysis, we can further reveal the purchasing behavior of consumers in Bangkok and provide empirical evidence for the marketing strategy of new energy vehicles.

Table 8 Path Coefficients and Hypothesis Testing Results for Bangkok

Variable Relationships	Loading	P	H	Result
Motivation⟶Perceived Usefulness	0.458	***	H1	Accepted
Motivation⟶Perceived Ease of Use	0.276	***	H2	Accepted
Motivation⟶Perceived Risk	0.516	***	H3	Accepted
Opportunity⟶Perceived Usefulness	0.086	0.034**	H4	Accepted
Opportunity⟶Perceived Ease of Use	0.168	***	H5	Accepted
Opportunity⟶Perceived Risk	0.075	0.029**	H6	Accepted
Ability⟶Perceived Usefulness	0.438	***	H7	Accepted
Ability⟶Perceived Ease of Use	0.453	***	H8	Accepted
Ability⟶Perceived Risk	0.573	***	H9	Accepted
Perceived Usefulness⟶Consumer Purchase Behavior	0.237	***	H10	Accepted
Perceived Ease of Use⟶Consumer Purchase Behavior	0.299	***	H11	Accepted
Perceived Risk⟶Consumer Purchase Behavior	0.419	***	H12	Accepted

From the analysis of Table 8, the following main conclusions can be drawn:

1. Impact of Consumer Motivation

Consumer purchase motivation has a significant positive effect on perceived usefulness (H1: β = 0.458, $p < 0.001$), perceived ease of use (H2: β = 0.276, $p < 0.001$), and perceived risk (H3: β = 0.516, $p < 0.001$). Therefore, hypotheses H1, H2, and H3 are supported. These results indicate that in the Bangkok NEV market, stronger consumer motivation enhances perceptions of usefulness and ease of use, while also reducing perceived risks associated with NEVs.

2. Impact of Purchase Opportunities

Purchase opportunities show significant but relatively weak positive effects on perceived usefulness (H4: β = 0.086, $p = 0.034$) and perceived risk (H6: β = 0.075, $p = 0.029$), along with a stronger positive effect on perceived ease of use (H5: β = 0.168, $p < 0.001$). Hence, hypotheses H4, H5, and H6 are supported. Although these effects are statistically significant, the relatively low path coefficients suggest that in Thailand's emerging NEV market, external purchase opportunities—such as market incentives and government policies—currently exert a limited impact on consumer perceptions, warranting further investigation.

3. Impact of Purchasing Ability

Purchasing ability has a strong and statistically significant impact on perceived usefulness (H7: β = 0.438, $p < 0.001$), perceived ease of use (H8: β = 0.453, $p < 0.001$), and perceived risk (H9: β = 0.573, $p < 0.001$). Thus, hypotheses H7, H8, and H9 are supported. These findings highlight the critical role of consumers' individual capabilities—including economic resources, knowledge, and technical competence—in positively shaping their views of NEVs and reducing perceived risks in the Bangkok market.

4. Impact of Perceptual Factors on Purchase Intention

Further analysis reveals that perceived usefulness (H10: β = 0.237, $p < 0.001$) and perceived ease of use (H11: β = 0.299, $p < 0.001$) exert significant positive influences on consumer purchase intention, while perceived risk (H12: β = 0.419, $p < 0.001$) has a significant negative effect. Therefore, hypotheses H10, H11, and H12 are confirmed. These findings validate the predictions of the Technology Acceptance Model (TAM), demonstrating that when consumers perceive NEVs as useful and easy to use, their purchase intention increases significantly. Conversely, higher perceived risk substantially reduces their willingness to purchase.

The purchase intention of Bangkok's new energy vehicle consumers is shown in Figure2.

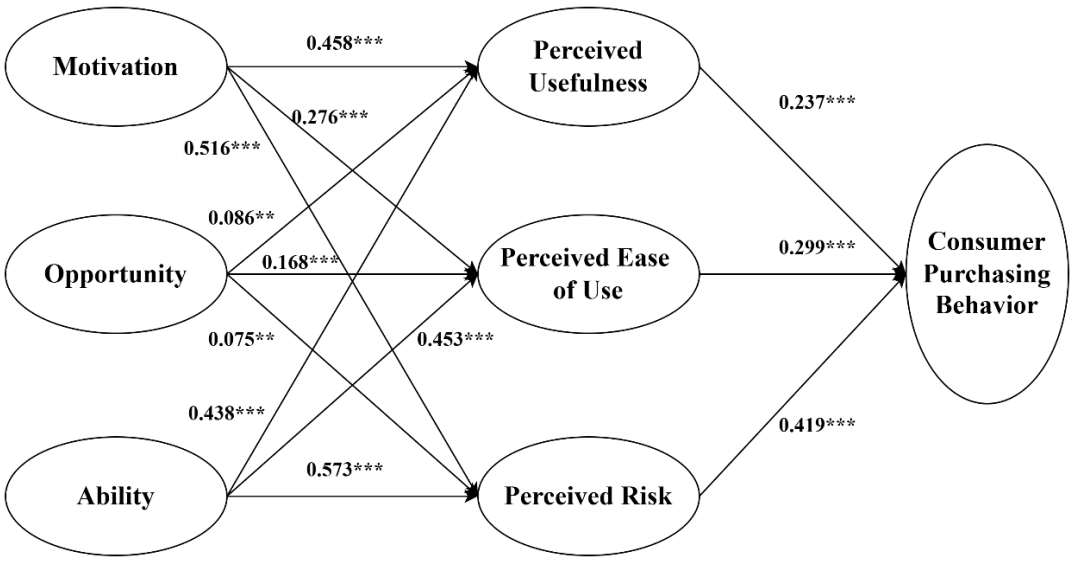

Figure 2 Final Result in Structure—Bangkok

2.7 Mediation Effect Analysis

In consumer behavior research, mediation effect analysis is used to test whether a variable (the mediator) plays a bridging role between the independent variable and the dependent variable, that is, whether it partially or completely explains the relationship between the two. This study used the Bootstrap method for mediation effect testing to ensure the robustness and reliability of the results. Specifically, this study explores whether perceived usefulness, perceived ease of use, and perceived risk mediate the relationship between consumer motivation, purchase opportunity, purchasing ability, and new energy vehicle purchase intention. If the mediation effect is significant, it indicates that the variable plays a key role in influencing consumers' purchase intention; if the mediation effect is not significant, it means that the variable fails to establish an effective connection between the independent and dependent variables.

2.8 Mediation Effect Test Results for Bangkok Consumers' Influence on New Energy Vehicle Purchase Intention Factors, Table 4-9

Table 9 Mediating Effect Test of Factors Influencing Consumers' Purchase Intention of New Energy Vehicles in Bangkok

Pathways	Bias-corrected 95% CI					Percentile 95% CI				
	Effect	SE	Lower	Upper	P	Lower	Upper	P	H	Result
Motivation⟶Perceived Usefulness⟶Consumer Purchase Behavior	0.1087	0.022	0.0697	0.1546	0.0007	0.0677	0.1527	0.001	Ha1	Accepted
Motivation⟶Perceived Ease of Use⟶Consumer Purchase Behavior	0.0825	0.017	0.0518	0.1205	0.0009	0.0514	0.1194	0.001	Ha2	Accepted
Motivation⟶Perceived Risk⟶Consumer Purchase Behavior	0.2145	0.029	0.1569	0.2712	0.0014	0.1591	0.2738	0.001	Ha3	Accepted
Opportunity⟶Perceived Usefulness⟶Consumer Purchase Behavior	0.0204	0.013	-0.003	0.0498	0.0836	-0.0035	0.0489	0.0945	Ha4	Rejected
Opportunity⟶Perceived Ease of Use⟶Consumer Purchase Behavior	0.0502	0.015	0.0243	0.0848	0.0006	0.0224	0.0818	0.001	Ha5	Accepted

Pathways	Bias-corrected 95% CI					Percentile 95% CI				
	Effect	SE	Lower	Upper	P	Lower	Upper	P	H	Result
Opportunity⟶Perceived Risk⟶Consumer Purchase Behavior	0.0314	0.016	0.0023	0.069	0.0355	-0.0001	0.0648	0.0504	Ha6	Accepted
Ability⟶Perceived Usefulness⟶Consumer Purchase Behavior	0.104	0.021	0.0668	0.1501	0.0008	0.0654	0.1489	0.001	Ha7	Accepted
Ability⟶Perceived Ease of Use⟶Consumer Purchase Behavior	0.1353	0.022	0.0966	0.1826	0.0005	0.0935	0.1798	0.001	Ha8	Accepted
Ability⟶Perceived Risk⟶Consumer Purchase Behavior	0.2383	0.031	0.1841	0.3017	0.0007	0.1812	0.2984	0.001	Ha9	Accepted

2.9 Bangkok Consumers' Mediation Effect Test Results for NEV Purchase Intention Based on the Bootstrap Method

Perceived usefulness plays a significant mediating role between consumer motivation and purchase intention (Ha1, $\beta = 0.1087$, $p < 0.01$), indicating that consumer purchase motivation not only directly affects their purchase intention but also enhances purchase intention by increasing their perception of the usefulness of new energy vehicles.

Perceived ease of use also plays a significant mediating role between consumer motivation and purchase intention (Ha2, $\beta = 0.0825$, $p < 0.01$), suggesting that the stronger the consumer motivation, the higher their perception of the ease of use of new energy vehicles, which in turn increases purchase intention.

Perceived risk also plays a significant mediating role (Ha3, $\beta = 0.2145$, $p < 0.01$), indicating that the stronger the consumer motivation, the lower their perception of risk regarding new energy vehicles, thus promoting purchase intention.

Perceived ease of use has a significant mediating effect between purchase opportunity and purchase intention (Ha5, $\beta = 0.0502$, $p < 0.01$), suggesting that as consumers' purchase opportunities increase, their perception of the ease of use of new energy vehicles improves, which in turn boosts purchase intention.

Perceived risk has a significant mediating effect between purchase opportunity and purchase intention (Ha6, $\beta = 0.0314$, $p < 0.05$), indicating that purchase opportunities can indirectly influence

purchase intention by affecting consumers' perception of risk.

However, the mediating effect of perceived usefulness between purchase opportunity and purchase intention is not significant (Ha4, β = 0.0204, p = 0.0836), suggesting that in the Bangkok sample, purchase opportunities do not further influence purchase intention by enhancing perceived usefulness.

The mediation effects of perceived usefulness, perceived ease of use, and perceived risk between purchasing ability and purchase intention are all significant (Ha7, β = 0.104, p < 0.01; Ha8, β = 0.1353, p < 0.01; Ha9, β = 0.2383, p < 0.01), indicating that factors such as consumers' economic, knowledge, and technical abilities not only enhance their perception of the usefulness and ease of use of new energy vehicles but also reduce their perception of risk, thus increasing purchase intention.

Overall, Bangkok consumers' purchase intention for new energy vehicles is significantly mediated by perceived usefulness, perceived ease of use, and perceived risk.

Conclusion and Discussion

1. Conclusion

1.1 What are the characteristics of early adopters of new energy vehicles?

This study uses grounded theory and demographic data analysis to identify the main characteristics of early adopters of new energy vehicles in Bangkok. In terms of demographic characteristics: the age of early adopters in Bangkok is mainly concentrated between 24 and 45 years old, and 57.1% of them have a bachelor's degree or above. Policy-driven policies have a weak impact on Bangkok market policies, and policy support is relatively small. Consumers' car purchase decisions are more dominated by brand influence and technological appeal. Economic considerations are the core factors that consumers pay attention to. The low energy consumption cost, low maintenance cost and long service life of new energy vehicles make them more attractive to economical consumers. Especially for high-frequency car users such as online ride-hailing drivers and long-distance commuters, their car purchasing decisions are mainly driven by long-term economic benefits.

1.2 How Does Digital Intelligence Technology Specifically Influence Consumers' Purchase Intentions?

Digital intelligence technology enhances consumers' perceived usefulness (PU) of New Energy Vehicles (NEVs), indirectly strengthening their purchase intentions. In the Bangkok market, features such as in-vehicle intelligent systems, autonomous driving assistance, remote control, and vehicle connectivity have attracted significant consumer attention. Smart configurations have gradually become a crucial selling point for NEVs. Research data indicate that digital technology functions (DTF) and intelligent technology functions (ITF) exhibit high factor loadings in the Bangkok market (DTF1 = 0.76, DTF2 = 0.796; ITF1 = 0.823, ITF2 = 0.88), demonstrating a strong consumer demand for NEV smart functionalities.

Findings suggest that digital intelligence technology is emerging as a key driver of Bangkok's NEV market. Consumer perceptions of NEVs are shifting from a traditional emphasis on "economic efficiency" to a growing preference for "technological intelligence." Features such as autonomous driving and vehicle connectivity significantly enhance perceived usefulness, thereby increasing purchase intentions. As Bangkok continues to develop its smart transportation infrastructure, the influence of digital intelligence technology on the NEV market is expected to expand further. This underscores the importance of integrating advanced smart technologies into NEVs to align with evolving consumer preferences and market demands.

1.3 The Influence of Social Factors on Bangkok Consumers' Purchase Intentions for New Energy Vehicles

Social factors significantly influence NEV purchase intentions among Bangkok consumers. Policy support, group norms, information utility, and media publicity collectively constitute the "Opportunity" (OPT) construct, demonstrating a significant but moderate effect on consumer purchase behavior (β = 0.218, $p < 0.05$). Specifically, policy support (λ = 0.72) currently relies mainly on import tax reductions, thus exerting limited influence. Group norms (λ = 0.67) have a relatively low impact due to limited NEV market penetration and insufficient peer exposure.

Information utility (λ = 0.74) indicates consumers' dependence on official brand sources, restricting comprehensive understanding. Media publicity (λ = 0.69) is gradually shifting toward digital marketing, enhancing consumer engagement potential through platforms such as short-form videos, social

media, and KOL endorsements. Therefore, future strategies should prioritize enhancing direct government subsidies, intensifying peer-based social marketing, diversifying information dissemination channels, and adopting robust digital marketing approaches to accelerate NEV adoption in Bangkok.

This study shows that the purchase intention of Bangkok consumers is indirectly affected by perceived usefulness, perceived ease of use and perceived risk, but the mediating effects of different variables are different. Perceived usefulness plays a significant role in the motivation and purchasing power path, while market opportunities have a weaker impact. Perceived ease of use is mainly affected by market opportunities and purchasing power. The improvement of charging facilities and the improvement of knowledge level are crucial, while the role of motivation is not significant. Perceived risk has the greatest impact on purchase intention and plays a key role in the motivation, market opportunity and purchasing power paths, reflecting consumers' high attention to product safety, technology maturity and market stability.

Bangkok's new energy vehicle market still faces challenges of insufficient consumer awareness and market environment constraints. The government and enterprises should strengthen market education, improve infrastructure, and optimize policy incentives to reduce consumer risk awareness, increase acceptance of new energy vehicles, and promote market development.

2. Discussion

The primary aim of this study is to examine the key factors influencing consumer purchase intentions toward New Energy Vehicles (NEVs) in Bangkok, Thailand, within the context of the Digital Intelligence Era. The findings demonstrate that consumer motivation and purchasing ability significantly enhance perceived usefulness and perceived ease of use, while effectively reducing perceived risk, thereby positively influencing consumers' purchase intentions. Although market opportunity factors such as policy incentives and tax benefits have a statistically significant effect on consumer purchase behavior, their overall impact remains moderate, indicating that further reinforcement of market incentives is necessary. Furthermore, the results highlight that digital intelligence features significantly enhance consumers' perceptions of NEVs' practicality, reflecting a consumer preference shift from traditional economic considerations toward advanced intelligent technologies. These

findings underline the importance for policymakers and enterprises to actively improve market penetration by developing robust infrastructure, implementing clear and effective policy incentives, and conducting consumer education programs to mitigate perceived risks and uncertainties associated with NEVs.

The findings are consistent with previous research. For instance, consumer motivation driven by environmental awareness and sustainable living aligns with the findings of Mouloudj et al. (2023), who argued that consumers with heightened environmental concerns are more likely to adopt NEVs (Mouloudj et al., 2023). Regarding opportunity factors, government incentives such as subsidies and tax benefits, though statistically significant, exhibited limited overall effectiveness—a result aligning with Chen et al. (2022), suggesting the necessity for stronger and sustained policy incentives (Chen et al., 2022). Additionally, the significant influence of purchasing ability factors, such as infrastructure availability and ease of use, corresponds with findings from Zhang and Liang (2023).

From a theoretical perspective, this study contributes to the Stimulus–Organism–Response (SOR) framework in two important ways. First, it confirms the applicability of the SOR model in a new context, showing that the framework is useful for understanding consumer adoption of NEVs in Bangkok, an emerging market where behavioral patterns have been insufficiently explored. Second, the study extends the framework by introducing “digital intelligence” (e.g., autonomous driving, smart connectivity, and remote control) as a novel type of stimulus. The findings demonstrate that these technological features strongly influence consumers’ cognitive evaluations and purchase intentions, thereby highlighting the growing importance of digital attributes alongside traditional market stimuli such as incentives and infrastructure. Together, these contributions not only validate the robustness of the SOR framework but also advance it by incorporating technology-driven stimuli into consumer behavior research.

In the organism dimension, the important role of perceived usefulness and ease of use in biological psychological processes is consistent with existing literature. For example, Kurniawan et al. (2022) found that perceived usefulness mediates the relationship between perceived opportunity and trust in the platform, thereby affecting consumers' purchase intention (Kurniawan et al., 2022). and Zhang et al. (2023) found that

perceived usefulness, perceived ease of use, and perceived risk affect the purchase intention of new energy vehicles through mediation (Zhang et al., 2023).

Although the S-O-R framework provides a solid theoretical foundation for understanding NEV purchasing behavior, it is important to note the dynamics of market conditions and consumer preferences. Technological innovation and progress, and the constant changes and developments in society significantly affect stimuli and consumer psychology, which ultimately affect purchasing behavior (Yang et al., 2022). In addition, the interaction of personal values, social norms, and government policies also has a significant impact on consumer behavior (Yuanyuan et al., 2024). Therefore, future research should emphasize these dynamic factors to enhance the adaptability and predictive power of theoretical models.

Recommendations

1. Recommendations at the practical action

Based on the study findings, several practical actions are recommended to promote NEV adoption in Bangkok. First, the government should strengthen incentive policies by introducing direct purchase subsidies and expanding tax benefits to reduce financial barriers. Second, both public and private sectors should collaborate to improve charging infrastructure, particularly in residential and high-traffic urban areas. Third, enterprises and policymakers should enhance consumer education through digital campaigns and public outreach, raising awareness of NEV benefits. Fourth, manufacturers are encouraged to invest in smart vehicle technologies to align with shifting consumer preferences toward digital intelligence features. Finally, reducing perceived risk through extended warranties, reliable after-sales services, and transparent communication can further increase consumer confidence. Together, these strategies offer a comprehensive roadmap for accelerating NEV market growth in Bangkok.

2. Research Limitations and Future Directions

This study concentrates on the new energy vehicle (NEV) market in Bangkok, which, while representative of Thailand's urban consumer landscape, presents certain limitations. First, in terms of sample representativeness, the findings may not be generalizable to second-tier cities or rural areas, where differences in economic conditions, policy support, and infrastructure may lead to varying consumer behaviors and purchase

intentions. Second, the study is based on cross-sectional data collected at a single point in time, which may not fully capture the dynamic nature of consumer attitudes in a rapidly evolving NEV market. Changes in government policy, technological advancements, and shifting public perceptions may influence consumer decisions over time. Lastly, this research focuses primarily on the purchase intention stage, lacking discussion of post-purchase factors such as user experience, product satisfaction, and brand loyalty. These areas warrant further investigation to better understand long-term consumer behavior and market sustainability.

Future studies should first consider cross-regional comparisons, particularly among Southeast Asian countries, to assess how varying economic conditions and policy environments influence NEV adoption. Such comparative research can offer insights into region-specific strategies and contribute to a more global understanding of consumer behavior. Second, the impact of emerging technologies—such as intelligent networking and autonomous driving—on purchase decisions and user trust should be explored, especially as these innovations become increasingly central to the NEV experience. Third, longitudinal studies are recommended to track consumer usage over time, identify evolving trends, and assess the long-term effects of policy and market changes. These future directions will not only enhance theoretical development but also provide valuable guidance for policymakers and industry stakeholders aiming to promote sustainable growth in the NEV sector.

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