The Seybold Report

ISSN 1533-9211

TECHNOLOGY ACCEPTANCE AND DECISION OF THAIS ON ELECTRIC CARS WORKING IN BANGKOK

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Abstract

This study investigated the acceptance of technology and purchase decisions regarding electric cars among residents of Bangkok, Thailand. Data from 400 questionnaires were analyzed, revealing that most respondents were male (75%), held Master's degrees, worked in personal businesses, and earned over 80,000 baht per month. Technology acceptance and consumer buying behavior significantly influenced purchasing decisions, with high overall purchase intention. Reliability, fuel cost savings, and after-sale service were key drivers for buying electric cars. Socio-demographic factors like education, occupation, and income also influenced buying behavior. Additionally, a moderate relationship was found between technology acceptance and consumer buying behavior. While this research provides insights for entrepreneurs to enhance electric car adoption, it focuses on a limited set of factors. Future studies should explore factors like environmental awareness, marketing strategies, and readiness to support electric car usage.

Keywords: Technology Acceptance, Consumer Purchasing Behavior, Electric Car Purchase Decision

1. INTRODUCTION

The text discusses global economic challenges, trade tensions, and the impact of COVID-19, with a focus on Thailand's response and the growing significance of electric vehicles (EVs) as an eco-friendly solution. It highlights international support for EV adoption through policies and tax incentives, including Thailand's tax reductions. Despite favorable policies and infrastructure, public acceptance and adoption in Bangkok face obstacles related to technology acceptance and consumer concerns. The text calls for a better understanding of these factors to drive EV adoption and urges businesses to cater to this emerging market.

2. REVIEW OF LITERATURE

This collection of studies explores the multifaceted factors influencing consumers' choices concerning electric vehicles (EVs) and innovative technologies. Key findings cover demographics, marketing strategies, technology acceptance, brand image, charging infrastructure, environmental awareness, marketing communications, and societal responsibility, ultimately showing that these factors interact in complex ways to shape consumer decisions regarding EV adoption. Despite some variations in study results, there's overall optimism about the future of EVs, with government support and growing environmental consciousness driving market growth.

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2.1 Theoretical Framework in history of electric cars

The history of electric vehicles dates back to the 19th century with early innovations in batteries and electric trains, but gasoline engines dominated. Interest resurged during the 1970s and 1980s due to energy crises. However, significant revival occurred in the 21st century, around 2008, driven by advances in battery technology and environmental concerns. Governments worldwide now incentivize electric vehicle adoption, promising a greener future for transportation.

2.2 Conceptual and Theory Related to Technology Acceptance

Technology Acceptance, influenced by factors like Perceived Usefulness, Perceived Ease of Use, Perceived Financial Benefit, and Symbolism, predicts how individuals integrate technology, including electric vehicles (EVs), into their lives. Fred Davis's Technology Acceptance Model (TAM) connects Perceived Usefulness and Perceived Ease of Use to forecast technology adoption, with Perceived Financial Benefit and symbolism, reflecting environmental and health consciousness, playing significant roles in the process.

2.3 Concepts related to social class and social class hierarchy (Socioeconomic class)

Social class, an ancient concept rooted in factors like income, education, and occupation, categorizes individuals in society based on reputation, position, and power, leading to distinct lifestyles and consumption patterns. Brand awareness, encompassing recognition and recall, is crucial for both short-term sales and long-term success, significantly impacting consumer choices, as emphasized by models like Keller's Customer-Based Brand Equity Model and Aaker's Brand Equity Model, which highlight the role of consumer perception in building a strong brand.

2.4 Concept of social class structure division

In Thailand, social class is determined by economic, social, and cultural factors, leading to three main classes: High Social Class consisting of professionals, Middle Social Class including skilled occupations, and Lower Social Class comprising jobs with no specialized expertise. These distinctions reflect differences in income, power, recognition, rights, and wealth and can influence societal cohesion or differentiation. Common classification methods include the Index of Status Characteristics (ISC) and the Socioeconomic Status Score (SES).

2.5 Concept of Index of Status Characteristics or ISC (W.L. Warner and P.S. Ludt, 1942)

Social class in Thailand is determined by four key variables, primarily occupation, which is divided into Upper Class, Middle Class, and Lower Class, resulting in six distinct social classes based on monthly household income and occupation type, ranging from the Upper Upper Class with incomes exceeding 160,000 baht to the Lower Lower Class with incomes below 7,500 baht, serving as a classification system in Thailand.

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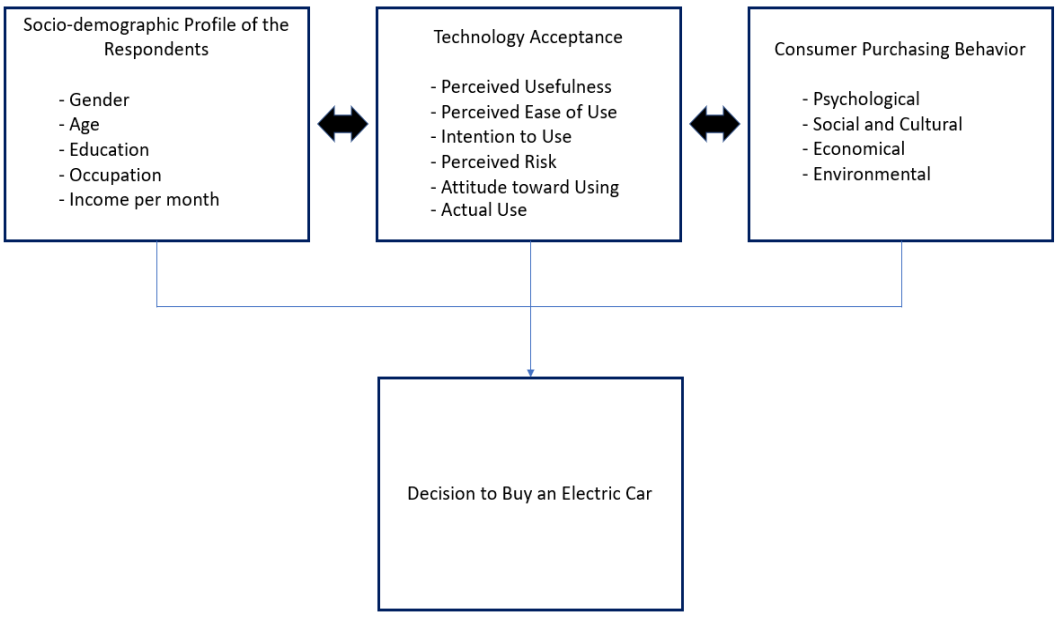
2.6 Concept of Socio-Economic Status

Socioeconomic Status (SES) categorizes social classes based on factors like race, birthplace, income, occupation, and family background. SES leads to distinct cultures, experiences, and attitudes among people from different classes, influencing their values and life goals. The SES Score considers three key indicators: occupation, family income, and education level. In the United States, SES is divided into four levels: Upper Class (A=High), Upper Middle-class (B=High Intermediate), Middle-class (C=Intermediate), and Lower Middle-class (D=Intermediate), with the middle class (C to B) comprising over 54% of the population in 2010 and more than 72% in 2019.

2.7 Concept and Theory Related to Consumer Purchasing Behavior

Consumer behavior is the study of how individuals make decisions about spending resources on goods and services. It encompasses who the consumers are, what they buy, why they buy, how, when, where, and how often they buy. Buyer behavior, synonymous with customer behavior, involves actions related to exchanging money for goods and services, whether for individual or industrial purposes. Consumer roles include initiators, influencers, decision-makers, buyers, and users. Analyzing consumer behavior considers controllable and uncontrollable stimuli that enter consumers' "black box" and lead to visible behavioral responses. This process is influenced by cultural, social, personal, and psychological factors, along with the consumer decision-making process's five steps: recognizing a need, seeking information, evaluating alternatives, making purchase decisions, and displaying post-purchase behavior. Understanding these components aids in identifying stimuli that drive consumer purchasing behavior and influence product choices.

2.8 Conceptual Framework



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3. METHODOLOGY

3.1 Research Design

This study employed a descriptive correlation design, which involves systematically examining and reporting on a phenomenon within a studied population or sample. It includes processes such as data collection, interpretation, and statistical analysis to investigate and test relationships between specific variables.

3.2 Research Locale and Sampling Procedures

The study focused on Thai individuals working in Bangkok who use electric cars. Data was collected from a sample of 400 individuals in Bangkok, Thailand, using the convenience sampling method, which involved distributing questionnaires to this target group.

3.3 Scope and Delimitation

This study focuses on assessing the acceptance of technology and consumer purchasing behavior among Thai individuals working in Bangkok, specifically related to the purchase of electric cars. The research process began with a literature review in May 2022, followed by data collection using an e-survey conducted in March-April 2023. Data was gathered for one month and will be analyzed. The dissertation is expected to be completed by mid-2023.

The study's population consisted of 400 samples of Thai individuals working in Bangkok who are potential purchasers of electric cars. Sample selection was done using the Yamane Formula and convenience sampling. Data was collected through a questionnaire, and the statistical tools used for analysis included frequencies, percentages, mean, standard deviation, and Pearson Correlation.

3.4 Research Instrument

The questionnaire development process involves deciding question types, brainstorming questions aligned with research goals, organizing and structuring questions logically, pretesting with a similar sample, revising based on feedback, finalizing with proofreading, obtaining ethical approvals if needed, administering appropriately, and analyzing collected data. This process ensures the questionnaire is effective, clear, and ethical in gathering the required information.

3.5 Data Gathering Procedure

The data collection process involved defining the study's purpose, providing detailed instructions for the questionnaire, distributing it to 400 participants in various Bangkok areas, assisting respondents, and subsequently reviewing and inputting the collected data for analysis.

3.6 Data Management and Analysis

The researcher employed SPSS software to manage and analyze data, with a comprehensive process covering data entry, cleaning, and validation, variable handling, security, and documentation. Statistical analyses included exploratory data analysis and planned procedures, with results interpreted contextually, validated for reliability, and leading to meaningful

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conclusions. Assessments used a Four-Point Likert Scale, calculated rigorously, enhancing research reliability.

3.7 Ethical Consideration

The researcher ensured the validity and trustworthiness of the study by adhering to ethical principles, including honesty in scientific communications, objectivity to prevent bias, respect for intellectual property, and confidentiality of respondents' information.

In the literature review and theory section, published and permissible data were used, with proper referencing of authors. The questionnaire underwent expert examination to identify unsuitable questions or potential privacy infringements. A request for assistance letter was included in the data collection process, emphasizing that all information obtained would be used for research purposes and kept confidential. These ethical practices contribute to the study's reliability and credibility.

4. RESEARCH RESULTS AND DISCUSSIONS

4.1 Demographics

The study found that the majority of respondents were male (75%), aged 41-50 (56.75%), held Master's degrees (59.25%), had their own businesses (39.25%), and earned over 80,000 Baht per month (47%). This suggests that males with higher education levels are more interested in buying new technology like electric cars. Many electric car buyers are business owners, possibly due to charging infrastructure inconveniences.

Additionally, socio-demographic factors such as gender, age, education, occupation, and income have been associated with electric car purchases. Men, younger individuals, those with higher education, environmentally conscious professions, and higher-income individuals are more likely to adopt electric vehicles.

4.2 The Technology Acceptance

The study found a strong "Very High" level of technology acceptance (mean score: 3.61) among respondents, with perceived risk, especially concerning battery replacement costs and charging station availability, as the top concern (3.73). This was followed by intention to use (3.71) and attitude toward using (3.66). Perceived ease of use and perceived usefulness received scores of 3.62 and 3.61, respectively, while actual use averaged 3.33. These findings highlight the significance of perceived risk in the adoption of electric cars, with perceived usefulness being less of a concern.

4.3 The Consumer purchasing behavior

The study revealed a "Very High" level of consumer purchasing behavior towards electric cars (mean score: 3.71) across psychological (3.75), economic (3.73), social and cultural (3.64), and environmental (3.71) aspects. Respondents displayed a positive attitude, economic considerations, social values, and environmental awareness that contributed to their willingness to adopt electric cars.

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4.4 The Decision to Buy an Electric Car

The study found a "Very High" level of intention to purchase electric vehicles (mean score: 3.70) among respondents. They expressed a strong desire to buy electric cars for various reasons, including trust in after-sales service, comparing different brands, seeking information from news sources, perceiving electric cars as modern, reliability, and cost savings. This indicates a strong intention to adopt electric cars, with a particular emphasis on the importance of after-sales service and thorough information gathering in the decision-making process.

4.5 Relationship between the Socio-Demographic Profile of the Respondents and Technology Acceptance in Buying Electric Cars

The study found that respondents' socio-demographic factors, including gender, age, and income, significantly influenced their technology acceptance when considering electric cars. Male respondents preferred user-friendly electric cars, while females valued safety and reliability. Younger individuals were more open to innovation, seeing electric cars as environmentally beneficial, while older respondents improved their perception of usefulness over time. Lower-income respondents were cost-conscious but recognized long-term savings, while higher-income individuals had a more positive attitude due to financial capacity. These findings contradict the hypothesis that socio-demographics have no effect on technology acceptance for electric cars.

4.6 Relationship between the Socio-Demographic Profile of the Respondents and Consumer Purchasing Behavior

Table 1: The relationship between the socio-demographic profile of the respondents and consumer purchasing behavior in buying electric cars (N=400)

		Psychological	Social and Cultural	Economical	Environmental
Sex	Pearson Correlation	0.054	-.134**	-0.046	0.058
	Sig. (2-tailed)	0.284	0.007	0.358	0.247
Age	Pearson Correlation	-.121*	.125*	-0.043	0.039
	Sig. (2-tailed)	0.016	0.012	0.388	0.44
Education	Pearson Correlation	-0.048	.117*	-0.011	.155**
	Sig. (2-tailed)	0.34	0.019	0.824	0.002
Occupation	Pearson Correlation	-.120*	0.094	-.181**	.160**
	Sig. (2-tailed)	0.017	0.059	0	0.001
Income per month	Pearson Correlation	0.016	.174**	0.007	0.071
	Sig. (2-tailed)	0.743	0	0.89	0.156
*. Correlation is significant at the 0.05 level (2-tailed).					
**. Correlation is significant at the 0.01 level (2-tailed).					

The study unveiled significant links between socio-demographic factors and electric car purchasing behavior: younger individuals were drawn to electric cars due to environmental and technological factors, older individuals became increasingly interested, higher education correlated with social-cultural and environmental considerations, occupation influenced psychological and economic factors, with engineers and government officers showing positive

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ISSN 1533-9211

attitudes, and certain occupations, like park rangers, displayed heightened environmental concerns. These results dispute the hypothesis that socio-demographics are unrelated to electric car purchasing behavior.

4.7 Relationship between Technology Acceptance and Consumer Purchasing Behavior

Table 2: **The relationship between technology acceptance and consumer purchasing behavior in buying electric cars (N=400)**

		Psychological	Social and Cultural	Economical	Environmental
Perceive usefulness	Pearson Correlation	.233**	-.144**	.130**	.244**
	Sig. (2-tailed)	0	0.004	0.009	0
Perceive ease of use	Pearson Correlation	.247**	-0.013	.242**	.138**
	Sig. (2-tailed)	0	0.8	0	0.006
Intention to use	Pearson Correlation	.325**	.249**	.164**	.324**
	Sig. (2-tailed)	0	0	0.001	0
Perceive risk	Pearson Correlation	.324**	.145**	.115*	.265**
	Sig. (2-tailed)	0	0.004	0.022	0
Attitude towards using	Pearson Correlation	.157**	.129*	.209**	0.062
	Sig. (2-tailed)	0.002	0.01	0	0.216
Actual use	Pearson Correlation	.110*	.099*	0.029	0.019
	Sig. (2-tailed)	0.028	0.048	0.557	0.703
*. Correlation is significant at the 0.05 level (2-tailed).					
**. Correlation is significant at the 0.01 level (2-tailed).					

The study discovered that various factors significantly influenced consumer purchasing behavior for electric cars, with perceived usefulness, technology acceptance, ease of use, intention to use, perceived risk, positive attitude, and actual use all playing roles across psychological, social and cultural, economic, and environmental dimensions. These findings contradict the hypothesis that these factors have no bearing on consumer purchasing behavior for electric cars.

5. CONCLUSION AND RECCOMMENDATION

5.1 Conclusion

The study found that electric car buyers in Bangkok were typically middle-aged, well-educated men with high incomes, who showed high technology acceptance and concern about perceived risk, a strong intention to use, and positive consumer purchasing behavior primarily driven by psychological, economic, and environmental factors. Their decision to buy an electric car was influenced by factors like reliability, cost savings, and after-sale service, with socio-demographics playing a significant role in shaping their attitudes and preferences across various aspects, including psychological, social, economic, and environmental factors, influenced by perceptions of sustainability and affordability.

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5.2 Recommendations

Based on the study's findings and conclusions, recommendations include using online media to promote electric vehicle benefits, encouraging adoption in the logistics sector, advertising innovations, revising laws for faster charging, investing in technician education, implementing tax reductions, encouraging corporate leaders to use electric cars, initiating pollution-reducing pilot projects, and conducting future research involving a broader demographic scope and qualitative methods.

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