

Development in Electric Vehicle Intention and Adoption: Integrating the Extended Unified Theory of Acceptance and Use of Technology (UTAUT) and Religiosity

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Abstract: Environmental sustainability has become an urgent problem that cannot be avoided and ignored. To mitigate the greenhouse effect in the road transportation sector, Malaysia is articulating a blueprint to reduce emissions through significant national contribution. As such, Malaysia is committed to further promote and adopt energy-efficient vehicles to reduce its carbon footprint under the United Nations Sustainable Development Goal (SDG) 2030 on climate change. The transportation sector is the main cause of greenhouse gas emissions. Many suggest electric vehicles (EVs) as a mechanism for reducing environmental degradation since EVs release less greenhouse gas as compared to combustion cars. However, the sales of EVs in Malaysia are still low compared to the achievements recorded by the neighboring countries. Despite being the earliest to promote electric vehicles, in the first quarter of 2023, Malaysia has only represented 2.4% of the EV market in Southeast Asia. It seems that the success rate in promoting environmental conservation through the adoption of EVs is still minimal. For this reason, the existing study seeks to explore factors related to EV behavioral intention and adoption by using the extended UTAUT (performance expectancy, effort expectancy, social influence, facilitating condition, perceived value/cost, hedonic motive, and habit). The proposed study believes that environmental protection and sustainability must be related to individuals' values and principles which could have been shaped based on religiosity. Therefore, in addition to the extended UTAUT that views EV intention and adoption from the technical and personal perspective, this study proposes religiosity as a predecessor in determining EV intention and adoption. The use of extended UTAUT and religiosity in the model will clarify the extent to which the influence of technical factors, personal factors and religiosity is determining the intention and adoption of EVs.

Keywords: *Intention, Adoption, Religiosity, Electric Vehicle, Unified Theory of Acceptance and Use of Technology (UTAUT).*

1. Introduction and Background

The Sustainable Development Goals (SDG) is an action plan to create a better and sustainable future for all. The goals are designed to address the global issues we are facing including pollution, climate change, global warming, the greenhouse effect, and environmental degradation. Necessity action to combat this challenge is imperative to save lives and livelihoods. In 2021, the global greenhouse effect has reached a new record that has resulted in the warmest temperature so far. To limit the warming effect globally, greenhouse emissions must decline to net zero by 2050 (UN SDG Summit, 2023). The transportation sector is the main source of greenhouse gas emissions which account for 28 percent of the total emissions in 2021 (United State Environmental Protection Agency, 2023). Carbon dioxide (CO₂) from the sector is 28.8 percent and well higher than the global average of 24.5 percent (International Energy Agency -IEA 2019).

In Malaysia, the sector drives for 96 percent of total greenhouse gas emissions and road transport is responsible as the largest emitter of CO₂. The emission mainly comes from burning fossil fuels since over 94 percent of the fuel is petroleum-based (petrol and diesel). Moreover, rapid development and growing population have caused a significant increase in the demand for transportation in this country. This has also resulted in the continuing growth of greenhouse gas emissions. This sector is undeniably devastating the environment and causes various forms of pollution, diseases, and damage to the environment.

Environmental sustainability has become an urgent problem that cannot be avoided and ignored. To mitigate the greenhouse effect in the road transportation sector, Malaysia is articulating a blueprint to reduce emissions through significant national contribution. As such, Malaysia is committed to further promote and adopt energy-efficient vehicles to reduce its carbon footprint under the United Nations Sustainable Development Goal (SDG) 2030 on climate change. The adoption of EVs is targeted to achieve the SDG in improving energy efficiency (Goal 7), to create inclusive, safe, resilient, and sustainable cities (Goal 11), and

climate action (Goal 13). The initiative is translated in The National Automotive Policy (NAP) 2014 with the target to transform Malaysia into a regional hub for energy-efficient Vehicles by 2020. Not only has the above policy but The Ministry of Environment and Water recently introduced The Low Carbon Mobility Blueprint (LCMB) 2021-2030. This blueprint aspires to achieve at least 15% of EV of total industry volume (TIV) by 2030, with 10,000 units of charging facilities built by 2025. Additionally, in supporting the realization of SDG 2023, the New Energy Policy (2022-2040) has set a new target of 38 percent of EVs from the total industry volume (TIV) by 2040. To further encourage the adoption of EVs, for locally assembled EVs, the government offers exemptions for whole import and excise duty as well as sales tax, while for imported EVs exemptions for whole import and excise duty is offered. Other than the above-mentioned measures, a road tax exemption and income tax relief up to RM2500 for the purchase, installation, rent, hire purchase, and subscription fees for EV charging facilities are being extended.

Many studies suggest the use of electric vehicles (EV) to reduce the amount of carbon dioxide emissions in the transport sector (Nie et al., 2018; Hoang et al., 2022; Manutworakit & Choocharukul, 2022; Irfanto & Aprilianty, 2022). EV plays a prominent role in reducing some of the negative impacts of road transportation on the environment and climate since it is proven to produce less greenhouse gases compared with fossil fuels. EVs do not release greenhouse gases when they run. However, greenhouse emission is represented during the generation of electricity that the vehicles draw from the electrical grid and store in their batteries (Canada Energy Regulator, 2018). The amount of greenhouse gas emission is also subject to the generation mix of local power generation. Countries that generate electricity power from hydro and nuclear have lower greenhouse emissions compared to countries that generate a large share of energy from coal and diesel. A study shows that greenhouse gas emissions from EVs are 17-30 percent lower than those from fossil fuels (European Environment Agency, 2023). Henceforth, the promotion and application of electric vehicles play a major role in reducing the environmental crisis.

EV is a mechanism that is expected to reduce greenhouse effects, pollution, and ecological degradation. The low energy consumption has elevated the role of EVs as a practical solution in setting the future development of the transportation industry. Many countries have been promoting the development of new energy vehicles. China for example, actively promotes the application of new energy by offering multiple subsidies (Nie et al., 2018). In the Southeast Asia market, the sale of electric vehicles is growing rapidly where Thailand recorded the highest sales volume in Q1 2023 that is accounting for almost 78.7 percent of the market share, followed by Indonesia (8 percent share), Vietnam (6.8 percent), and Singapore (4.1 percent). However, the sales of passenger EVs are not experiencing the same rate of popularity in Malaysia. Despite being the earliest to promote electric vehicles, Malaysia had only represented 2.4% of the share (The Malay Mail, 2023).

The adoption of electric vehicles is the principal solution to cut greenhouse emissions. Therefore, various studies have been conducted to identify additional determinants beyond the TPB constructs. The TPB focuses on self-interest factors such as perceived behavioral control, attitude, and subjective norms on general behavioral intention and adoption. Hence, explaining the intention and adoption of innovation adoption behavior requires a specifically designed model to explain intention and adoption of EV. The Unified Theory of Acceptance and Use of Technology (UTAUT) provides a better prediction towards innovation adoption (Venkatesh et al., 2003; Hoang et al., 2022). The UTAUT provides a holistic understanding of technology acceptance that focuses on the key determinants in predicting intention and behavioral action (Venkatesh et al., 2003; 2012). Based on UTAUT, behavioral factor that affects intention to buy EV is postulated by (i) performance expectancy, (ii) effort expectancy, (iii) social influence and (iv) facilitating conditions, (v) hedonic motivation, (vi) perceived value/price value, and (vii) habit.

Most environmental issues and their negative effects on the world are mainly the results of human activities and actions. The implementation of EV adoption also calls for human participation in changes in behaviors. Hence, an analysis related to the antecedent of EV adoption is considerably critical. While the Unified Theory of Acceptance and Use of Technology (UTAUT) provides valuable insights into the factors influencing individuals' intentions and behaviors toward electric vehicle adoption, it fails to consider certain important aspects. This study is aware that some voluminous initiatives and measures have been conducted to promote environmental conservation. Unfortunately, the success rate is still minimal. Hence, the proposed study believes that environmental protection and sustainability must be related to individuals' values and

principles. This study will look at the EV intention and adoption from the technical perspective governed by the extended UTAUT and integrates it with religious values. To date, there is a quite limited attention has been given to address the extent to which religious factors contribute to sustainability (Allen, 2018, Koehrsen & Huber, 2021).

Religiosity holds significant value in shaping human behavior and influencing various aspects of individuals' lives (Ived & Kidwell, 2019). It encompasses a wide range of practices and rituals, including attending religious services, praying, fasting, and adhering to religious laws and customs. In fact, religiosity does not only serve as an act of worship but also contributes to the moral and ethical development of individuals. Religiosity is a fertile motivator for environmental sustainability intentions (Ives & Kidwell, 2019; Ives et al., 2023). Religious practices in a society is a strategic asset for engagement in sustainability activities including activities in (i) public campaign, (ii) materialization of sustainability practices, and (iii) dissemination of sustainability practices (Koehrsen & Huber, 2021). Although studies have been done in estimating personal, psychological, and external forces on EV intention and adoption, an important factor related to religiosity has been barely analyzed.

Malaysia's EV market is currently still in an early stage, henceforth examining predicting constructs affecting the individual's purchase decision is an important undertaking. To date, most studies focus on purchase intention instead of actual behavior (Hoang et al., 2022). In addition, the existing studies somehow provide a wide application of the model in the organizational setting, i.e., employees yet still limited discussion about the utilization of technology by individual consumers (Marikyan & Papagiannidis, 2023). Moreover, although there is a significant increase in sustainability activities of religious organizations, research related to religiosity toward environmental sustainability is still dismal. This study aims to contribute two significant points to the existing literature. First, it is among the very few studies that explore UTAUT to explain EV intention and adoption among consumers in developing countries. Secondly, this study takes into consideration the role of religiosity in explaining EV adoption intention and behavior. It seeks to explore factors related to purchase intention and adoption by using the extended UTAUT with the inclusion of the religiosity element. This study is worthwhile to conduct since Malaysia is determined to promote the adoption of EVs in minimizing the greenhouse effect from the transportation sector. Therefore, understanding the intention and adoption of EVs from the viewpoint of customers will offer some ideas to the government and industry players' ways and means to shift people's preferences from combustion cars to EVs.

2. Literature Review

Intention and Behavior: Intention indicates how much effort an individual is willing to make in conducting actual behavior (Ajzen, 1991). Intention revolves around ideas that capture an individual's propensity to act. The stronger the intention, the higher the commitment to certain behavior as well as the tendency to conduct real action (Conner & Norma., 2022). A major difference exists between intention (goal) and behavioral intention (action). While the former emphasizes achieving the target goal, the latter focuses on engagement in a behavior or action. It is common to identify the difference between intention or goal and behavioral intention or action by giving one simple question for each. For instance, in "I plan to purchase EV", the word plan in the statement indicates a willingness to act instead of initiating certain behaviors or actions. For a statement indicating behavioral intention, it must clearly mention engagement or adoption towards the real action. For example, "I intend to adopt EV for city driving at least three days a week".

Hoang et al. (2022) provide the fact that intention to buy is a very significant determinant of behavior in purchasing EVs. The intention is discovered sufficient to promote the adoption of EVs in Indonesia. The finding clearly states that the stronger the intention to buy EVs, the higher the number of people who start to buy and use EVs (Irfanto and Aprilianty, 2022). The strong influence of intention on the adoption of EVs is confirmed when a positive association between purchase intention and adoption behavior in relation to EVs is supported in Thailand (Manutworakit & Choocharukul, 2022). The relationship between intention and behavior is also revealed in a study conducted in Iran where pro-environmental intention is directly related to pro-environmental behavior (Karimi et al., 2022).

Unified Theory of Acceptance and Use of Technology (UTAUT): The theory was established by Ventakesh

et al. (2003) to provide a holistic understanding of technology acceptance by integrating key determinants predicting behavioral intention and adoption. The formation of this theory is integrated from eight technological acceptance models including the Theory of Reasoned Action, TRA (Fishbein & Ajzen, 1975), the Theory of Planned Behavior, TPB (Ajzen, 1991), the Technology Acceptance Model, TAM (Davis, 1989), the Combined-TAM-TPB, C-TAM, (Taylor & Todd, 1995), Model of PC Utilization, MPCU (Thompson et al., 1991), Motivational Model, MM (Davis et al., 1992), Social Cognitive Theory, SCT (Bandura, 1986), and Diffusion of Innovation Theory, DOI (Rogers, 1995). The role of UTAUT in understanding technology adoption in different countries is significant and allows for the generalization of the findings irrespective of different cultural settings (Marikyan & Papagiannidis, 2023). In the first phase of UTAUT, Venkatesh et al. (2003) establish the theory based on four fundamental constructs including (i) performance expectancy, (ii) effort expectancy, (iii) social influence, and (iv) facilitating conditions. The UTAUT is then moderated by age, gender, experience, and voluntariness of use.

Originally, the first version of UTAUT was developed to explain and predict the technology adoption in an organizational context. Over the years, the application of the UTAUT has been widely found in non-organizational contexts. Given the restriction, Venkatesh et al. (2012) then revisited the UTAUT and offered an extension of UTAUT and named as UTAUT2. The revised UTAUT is not designed for a specific organizational target but to represent a framework for examining technological acceptance among individual consumers. In the revised UTAUT, the use of technology by individuals is estimated by the effect of three additional constructs, namely, (i) hedonic motive, (ii) perceived value/cost, and (iii) habit.

The use of extended UTAUT to understand EV intention and adoption will provide a clear understanding related to the technical factors, personal factors and supportive elements that will influence intention and decision to purchase EV. To date, there are still a limited number of studies that quantitatively and qualitatively explore purchasing behavior from the UTAUT perspective. Since the extended UTAUT is developed to understand the acceptance and use of technology, this study will view the EV intention and adoption by following the UTAUT as proposed by Venkatesh et al. (2003; 2012). Henceforth, this study proposes performance expectancy, effort expectancy, social influence, facilitating condition, perceived value/cost, hedonic motive, and habit as antecedents for EV intention and adoption.

Performance Expectancy (PE): Performance Expectancy is defined as the degree to which an individual believes that using the system will help the person to attain gains in job performance (Venkatesh et al., 2003). EV is viewed as a mechanism people expect to increase their productivity. The construct is perceived to draw considerable influence on the intention to purchase EVs. It is related to perceived usefulness/perceived benefits in TAM & C-TAM, extrinsic motivation in MM, relative advantage in DOI, job fit in MPCU and outcome expectations in SCT. Hoang et al. (2022) reported that PE positively affects intention for Battery Electric Vehicle (BEV) as BEV offers emission reduction, energy efficiency, low noise, and faster acceleration. In fact, performance expectancy is reported to create the largest significant impact on behavioral intention towards EV in a study conducted by Irfanto and Aprilianty (2022). The significant role of performance expectancy on new technology is also supported and fortified positively affects EV purchase intention (Manutworakit & Choocharukul, 2022). Consistently, a direct and positive relationship between performance expectancy and EV behavioral intention in Pakistan is also reported by Lee et al. (2021). However, in a study conducted by Abasi et al. (2021), performance expectancy is contrary to previous studies and reported to insignificantly affect consumer intention for EV adoption.

Effort Expectancy (EE): Effort Expectancy refers to the degree of ease associated with the use of the system (Venkatesh et al., 2003). The models related to this construct are perceived ease of use in TAM, complexity in MPCU, and ease of use in DOI. The innovation adoption intention depends on the benefits of the new technology as well as on the degree of easiness to use the new technology (Hoang et al., 2022). This construct indicates a positive effect on the intention of using battery electric vehicle since EVs is demonstrated as user-friendly vehicles (Hoang et al., 2022). Effort expectancy has a positive association with EV purchase intention if the EV is easy to operate (Manutworakit & Choocharukul, 2022). Based on the finding by Lee et al. (2021) it is confirmed that individual with perceived effort expectancy is said to have higher intention to purchase EVs. Since consumers expect EVs to be more convenient, save time, economical, and friendlier to the environment, effort expectancy is positively related to EV adoption intention (Abasi et al., 2021). A contradicting finding is

learned where effort expectancy is not significant on EV behavioral intention since Indonesian customers perceive that utilizing electric vehicles is not as convenient as gasoline vehicles (Irfanto & Aprilianty (2022)).

Social Influence (SI): Social Influence is the degree to which an individual perceives that important others believe he or she should use the new system. People are affected by companions, family, friends, acquaintances, and social patterns around them in making buying decisions. This is particularly applicable to collectivist countries. It is similar to subjective norms in TRA, TAM, TPB and C-TAM-TPB, social factors (MPCU) and image (DOI). It is about the influence of important people's opinions, such as families and friends on the decision-making process (Hoang et al., 2022). This variable does not create any relationship with the intention for EV when Hoang et al. (2022) test the variable in Vietnam. A consistent finding in Irfanto and Aprilianty (2022) about the unsupported claim of social influence over EV behavioral intention is reported in Indonesia. It shows that buying a newly innovative product is a personal decision due to the relatively small market that resulted in low power of influence to each other. The earlier study in Pakistan shares the same outcome where social influence shows an insignificant relationship with intention to adopt EV (Lee et al. 2021). On the other hand, a study by Manutworakit & Choocharukul (2022) reported a contradicting finding when social influence is found to positively influence intention for EVs in Thailand. As a collectivist country that cares for each other, Abbasi et al. (2021) confirm social influence has a positive influence on the intention to adopt EVs in Malaysia.

Facilitating Conditions (FC): Facilitating Conditions explain consumers' perceptions of the infrastructures, resources, and supports available to support the technology adoption (Venkatesh et al., 2003). The reliability of the supporting infrastructure such as charging stations and maintenance facilities serves as input to form EV intention and adoption. This construct is found in perceived behavioral control of TPB, C-TAM-TPB, facilitating conditions (MPCU), and compatibility (DOI). Facilitating condition is displayed as an insignificant variable in determining behavioral adoption of EVs but significantly explains the intention to buy EVs (Hoang et al., 2022). A country with a lack of infrastructure to support the adoption of EVs and a lack of possession of technological knowledge, for example, Indonesia demonstrated with insignificant influence on behavioral intention and adoption of EVs as mentioned by Irfanto and Aprilianty (2022). EV is still in the introductory stage in Thailand so the facility condition making this variable has no significant effect on the intention and adoption of BEV (Manutworakit & Choocharukul, 2022). A study in Pakistan shows a consistent finding in reporting the insignificant effect of facilitating conditions on intention for EV adoption (Lee et al., 2021).

Perceived Value/Cost (PV/PC): Perceived Value/Cost is defined as consumers' trade-off between the perceived benefits/projected advantages of the applications and the monetary cost of using the technology (Venkatesh et al., 2012). It is related to the evaluation of the benefits and costs of a particular product. The overall assessment of the consumption of a particular product is done based on a comparison between what is received and what is given (Zeithmal, 1988). When consumer perceives the benefit of technology as higher and more important than the monetary cost, it positively affects perceived value and positively affects behavioral intention (Marikyan & Papagiannidis, 2023). Perceived value conveys customer acceptance that a product can meet his or her expected benefits. If the expected benefit outweighs the expected cost, it certainly shows that the perceived value of the product is to be high. In a setting where the customer believes a product is valuable and beneficial, customers may be highly inclined to pay a premium price, and vice versa. In addition, understanding perceived value typically increases purchases, cross-buying, word-of-mouth referrals, less returns and serves as a vital component in the decision-making process (Sivananthan & Shivany, 2013). Perceived value is a factor that explains consumer buying decisions. However, in a developing country such as Indonesia, customers placed more attention on the high price of EVs instead of the trade-off between EV benefits and the cost. As a result, perceived value is showcased to create an insignificant influence on EV behavioral intention and adoption (Irfanto & Aprilianty, 2022). A similar finding is reported in Thailand in which the higher price of EVs than that of combustion cars has resulted in the perceived value and intention for EVs not being significant (Manutworakit & Choocharukul, 2022).

Hedonic Motive (HM): Hedonic Motive refers to the enjoyment or pleasure of customers derived from using technology (Venkatesh et al., 2012). The hedonic motive is meant to seek pleasure and comfort (Chen & Zeng, 2022). It shows a willingness to initiate behaviors that result in improved positive experiences or decreased negative experiences (Kaczmarek, 2017). For instance, the enjoyment of driving an EV happens only when the

driver picks up new abilities to drive the EV. The hedonic motive shows emotional factors that influence EV intention and adoption. This motive is shaped by psychological drives including emotion, satisfaction, pride and other subjective (Gunawan et al., 2022). Yidirir and Kaplan (2018) say consumers are evaluating their future feelings during and after buying transactions, in which customers must enjoy the purchase. EV performance, economical features and ability to drive will induce customers to spend more time to explore about EV and may drive them to buy EVs that maybe initially they have not planned for. Without the confidence to drive EV, a hedonic motive does not draw any significant effect on the intention to embrace EV as reported by Irfanto and Aprilianty (2022). Yidirir and Kaplan (2018) report similar findings where the hedonic motive is not significant in explaining the intention for mobile application marketing. Driving EV indeed rushes the hedonic experience among the individual users of EV which has resulted in a positive association between hedonic motives and EV behavioral intention (Manutworakit & Choocharukul, 2022). In fact, hedonic motivation is the strongest determinant that affects EV adoption (Rezvani et al., 2018). Hedonic motivation is the willingness to initiate behaviors that enhance positive experiences (pleasant or good) and behaviors that decrease negative experiences.

Habit (H): Habit refers to the extent to which people tend to perform behavior automatically because of learning activity (Venkatesh et al., 2012). Habit is perceived enjoyment, and studies show the significant impact of habit on mobile technology acceptance (Kleopatra et al., 2021). Habit is found to play a considerable role in determining EV intention and adoption only when there is a growing number of EV users and more people become familiar with the system (Irfanto & Aprilianty, 2022). This model highlights the important relationship between habit, behavioral intention, and adoption of embracing EVs. However, from the majority of UTAUT empirical studies (66 articles), 43 articles did not operationalize habit in their studies (Tamilmani et al., 2021). Some of the respondents mentioned they purposely left out habits from UTAUT. As a result, empirical studies related to habit and UTAUT can hardly be found. Studies must include habit in the framework especially when UTAUT is employed to govern the research framework. The existing study is conducted to fill in the gap so that habit is taken as part of the research design. The increased number of EVs on the road allows people to learn about EVs and may lead to a higher level of EV intention and adoption. Pahnla et al. (2011) studied the relationship between habit and intention to adopt technological products and concluded habit is significant in determining intention and adoption of technological products. Indeed, habit is a very strong predictor and valid construct for studying consumer intention (Tamilmani et al., 2014).

Religiosity: Religiosity is defined as the submission of oneself to the commands of his/her religion (Begum et al., 2021). The role of religiosity is increasingly important in social and behavioral science (Koenig et al., 2015). It has been found to create positive effects in numerous situations in lots of activities including in preserving the ecology. Religiosity is a value that is related to moral norms that encourage people to respond accordingly in sustaining the environment (Karimi et al., 2022). Religiosity is related to an individual's action toward the protection, maintenance and enhancement of the well-being of an external social object (Holdcroft, 2006). One aspect of sociomoral development is the role of religiosity in actively contributing to societal transitions towards sustainability. Religiosity has been debated to affect individuals' lifestyles, decision-making, behavior, thought and habits.

The problem in the modern economy is related to human actions that are full of greed and heedless motives that have negatively affected the environment. Creating excessive wealth has been the motive for geared-greed individuals or organizations and resulted in human actions to recklessly exploit natural resources. The advanced products in science and technology such as artificial intelligence can hardly address the endless human greed with heedless desire. Hence, the potential role of religiosity in encouraging pro-environmental behavior and societal transitions toward sustainability is increasingly important (Koehsen & Huber, 2021). Eco-theologies as highlighted in many religious traditions such as Islam, Buddhism, and Christianity. It must be further nurtured to contribute significantly to sustaining the environment.

From the viewpoint of Islam, it is stated in the Holy Quran that Allah has created a balanced ecosystem where if the resource is used excessively, it will cause environmental issues. Apparently, environmental sustainability is a fundamental instruction in Islamic teaching that has to some extent been neglected by humankind (Karimi et al., 2022). Islam taught its believers the importance of sustainability, fairness, balance, and judicial actions for the protection of the environment. In Islam, humans are the manager of the natural

resources and not the owner of the resources. The real owner of the environment is Allah, the creator of the universe. He appoints human beings as managers (Khalifah) to manage the given resources for their livelihood and must avoid causing problems and wasting natural resources. *“And do no mischief on the earth after it has been set in order: that will be best for you if ye have Faith” (Surat Al A’raf, ‘the Heights’, verse 85)*. As Khalifah, human beings must take all necessary actions to make sure the natural resources are inherited by the next generation in a pure form as possible. The managers (Khalifah) are responsible and accountable for environmental protection and conservation because the natural resources are not only created for humankind but also for other living things. *“Children of Adam, dress well whenever you are at worship, and eat and drink (as we have permitted) but do not be extravagant: God does not like extravagant people.” (Surat Al-A’raf 7:31)*. From the Islamic perspective, environment protection and conservation are a religious duty henceforth responsibility to utilize and protect the environment lies in every Muslims.

Christianity in its tradition outlines the importance of environmental-friendly ethics and requesting human stewardship for the environment. The biblical passage clearly points to criticism over environmental degradation and always promotes environmental concern (Blanc, 2022). Genesis 2:15 says “The Lord God took the man and put him in the Garden of Eden to work it and take care of it.” Christianity documented that all natural resources belong to the Lord God and people are accountable to God as stewards of the creation. Psalm 24:1-2 “The earth is the Lord's and everything in it, the world, and all who live in it; for he founded it upon the seas and established it upon the waters.” Church leaders are highly involved in promoting ecological sustainability by developing self-initiative programs against pollution and deforestation (Stork & Du Toit, 2022). Religiosity has created a success record in Lebanon when the church community responsibly succeeded in protecting the surrounding forest and moreover, they successfully promoted the program in the nearby community (Allen, 2018).

Buddhism taught its adherents to conduct their lives by consuming what is necessary for living, living in harmony with nature, as well as to use carefully and learn from nature wisely (Thathong, 2012). Any actions in breaking the norms that are associated with gods and spirits will result in bad luck and most commonly sickness (Woodhouse et al., 2015). In the Buddha's teaching, people in a society must be mutually supported and promote harmonious co-existing with nature, respect for all living creatures, create fairness in the ecosystem and uphold environmental sustainability. Engaged Buddhists are working together to combat extremely serious environmental problems by looking for new and innovative ways (Javanaud, 2020). Contemporary Buddhism and environmentalism have been in urgency to pursue sustainability initiatives to reduce environmental problems. This can be seen in the development of a website called EcoBuddhism, the Buddhist Declaration on Climate Change, and the International Campaign on Sustainability (Sponsel, 2016).

Apparently, religiosity plays a significant role in forming the behaviors of societies (Begum et al., 2021). The higher the religiosity, the higher is pro-environmental adoption. However, religiosity is explained as a non-significant predictor for pro-environmental intention (Karimi et al., 2022). Consistent with this finding, in predominantly Buddhist countries, one can find natural resource depletion, pollution, and environmental problems (Sponsel, 2016). The finding completely contradicted the Buddhist teaching that leans towards preserving Mother Nature. Indeed, the actual behavior of Buddhists in protecting the environment is far too good to be true. Interestingly, religiosity has created a success record in Lebanon when the church community succeeded in protecting the surrounding forest and simultaneously promoted the program in the nearby community effectively (Allen, 2018). Despite these contradictory findings, all religions highlight the importance of protecting the natural environment in their teachings. Since little has been done to study the impact of religiosity on the intention and adoption of EVs, for this reason, considering religiosity in determining the EV intention and adoption is worth analyzing.

Proposed Research Model: To further expand the knowledge of intention and behavior, this study is interested in examining the antecedents that could affect the intention and adoption to embrace EVs. Following Venkatesh et al. (2003; 2012), the proposed model consists of integration between UTAUT1, UTAUT2 and religiosity. In short, the extended UTAUT is composed of (i) performance expectancy, (ii) effort expectancy, (iii) social influence, (iv) facilitating conditions, (v) hedonic motive, (vi) perceived value/cost, and (vii) habit. All these factors are proposed to play a critical role in determining EV behavioral intention and intention to buy EVs will serve as antecedents to purchase EVs.

3. Research Methodology

The study proposes to explore the relationship between UTAUT and religiosity on intention to buy and adoption to embrace EVs. The unit of analysis of this study is at the individual level. They consist of EV potential buyers and actual EV buyers. Data will be gathered via questionnaires. Other than demographic data, the potential buyers and actual customers will be asked about the expected attributes of EV car, intention, and adoption. Information related to factors that will hinder potential buyers from purchasing EV cars will also be examined.

The measurement items for the constructs in UTAUT, religiosity, EV intention and adoption will be obtained from reliable sources. The proposed study will engage in a structured questionnaire and will employ online distribution techniques. Purposive sampling will be used to get responses from the existing EV buyers, while convenience sampling will be employed to understand the intention and future buying patterns toward EVs among potential buyers. The proposed study will engage in the Partial Least Squared Method in testing the hypotheses.

4. Managerial Implications and Recommendations

The United Theory of Acceptance and Use of Technology will be used to govern the proposed study. The objective is to develop an alternative model by integrating UTAUT1, UTAUT2 and religiosity from the context of EV intention and adoption. To the knowledge of the proposed study, very few studies have considered integrating UTAUT1 and UTAUT2 in EV intention and adoption. So far, the existing studies only considered these models in isolation. As a result, the results are often inconsistent and offer inconclusive corroboration.

Few studies have been found examining the relationship between religiosity and pro-environmental behavior. Although religiosity is explained as important for environmental protection in all religions but the findings from the empirical studies are conflicting. Karimi et al. (2022) concluded religiosity is a non-significant factor in determining pro-environmental intention but Allen (2018) claimed religiosity has successfully protected the ecology in Labenon. Hence, studying the impact of religiosity on EV intention and adoption is a critical gap that will be filled by this study since there has been limited agreement on how religiosity affects EV intention and adoption.

The proposed study will provide relevant guidance for policymakers and EV manufacturers in terms of the expectations of potential buyers. The information gathered from the actual buyers would be beneficial for both parties in designing the future policy, incentives, future attributes, and EV innovation. This study is also expected to contribute to the existing body of knowledge by integrating religiosity and employing the combined UTAUT1 and UTAUT2 in the analysis.

5. Conclusion

This study aims to create a framework for empirical research on EV intention and adoption among potential and actual EV buyers. Policymakers and manufacturers must understand the expectations of the potential and actual buyers to improve the adoption of EVs. From the policymakers' perspective, the findings gathered from the proposed research will facilitate the country in achieving its sustainability developmental goal which is to reduce the greenhouse emission effect from the transportation industry. On the other hand, the EV manufacturers will reduce the market gap in relation to what is being offered and what is expected to be offered. Understanding the EV market is becoming an important component to realize the achievement of sustainability goals. The objective of this paper was to establish a profile of EV potential and existing buyers, compare and explore the characteristics of EV customers, comprehend factors that will influence potential buyers' intention and decision in adopting EVs and to understand precursors that influence the real buyers in adopting EVs.

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