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Factors Influencing Purchase Intention on Electric Vehicle: A Conceptual Framework

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Abstract

In most developing countries such as Malaysia, motorized vehicles are the major contributors to air pollution in urban zones. Air pollution is a silent killer as it infiltrates the vital organs, leading to serious diseases and death. Recently, Electric vehicles are now widely considered as a way out alternative to the conventional transportation system. Scholars claims that EVs have a considerably more effective powertrain and are less expensive to maintain. In the same vein, Electric vehicles (EVs) in Malaysia are gaining more attention and interest from the public. However, the electric vehicle's exposure, awareness, and sales are still low compared to other Countries. Hence, it is pertinent for this study to identify the robustness and generalizability of the technology acceptance and technology readiness in assisting consumers from buying an electric vehicle. Thus, this study aims to explores the factors that influence purchase intention on electric cars in Malaysia. This study is in line with the

Malaysia plan towards achieving zero carbon emissions and focus on environmental sustainability.

Keywords: Purchase Intention, Electric Vehicle, Conceptual Framework, Malaysia

Introduction

The phenomenon of urbanization's expansion poses a severe danger to sustainability. Sustainability is gravely threatened by the phenomenon of population growth in urban regions at the expense of rural areas (Ruggieri et al. 2020). The urbanisation is commonly regarded as one of the causes that has led to an increase in greenhouse gas (GHG) emissions on a worldwide scale among the many topics being discussed in the area of climate change (Wei et al. 2021). International climate change policy's de facto main goal has evolved into limiting global climate change to less than 2 °C. Implementing transition policies is necessary for achieving these goals in different parts of the world. Although certain sectors, like those of power, are currently advancing, others, like transportation, still have a long way to go (Xu et al. 2021). Road cars are the main source of emissions, and the most recent projections indicate that by 2050, the number of passenger vehicles will have more than doubled. Reducing emissions, particularly those from the transport sector, is essential to achieving the emissions reduction goals even if action is required across all energy industries to attain carbon neutrality (Xu et al. 2021). High levels of air pollution caused by high population density, particularly the severe levels experienced by many emerging cities, pose serious health concerns to city dwellers and increase the prevalence of respiratory disorders and mortality rates (Bai et al., 2017).

Globally, environmental issues like air pollution, and the issue of motor vehicle pollution are becoming prominently important (Xie et al. 2019). A study by Shafie and Mahmud (2020) revealed that the transportation sector is a major source of traffic pollution in the city centre. In most developing countries such as Malaysia, motorized vehicles are the major contributors to air pollution in urban zones. Air pollution is a silent killer as it infiltrates the vital organs, leading to serious diseases and death (Brohi et al. 2018). Recently, electric vehicles have been regarded as an incredible option to the traditional transport system as countries worldwide, through policy instruments, are shifting towards Evs (Ajanovic and Haas, 2019). According to the literature, Evs have a much more productive powertrain, cheaper to maintain, and emit no chemicals into the environment, at least not while on the road (Bekel and Pauliuk 2019). This will contribute to sustainable development through modern technological innovations and eco-friendly lifestyle habits (Sun et al. 2023). In the case of Malaysia, Electric vehicles (Evs) are gaining more attention and interest from the public. However, the electric vehicle's exposure, awareness, and sales are still low compared to other Countries (Muzir et al. 2022). In Malaysia, electrified vehicles are still in the early stage of adoption, and technology acceptance is not as notable as represented in other developed countries such as the United States and Europe (Tanwir and Hamzah, 2020). The environmental preservation is severely hampered by this (Huang and Ge, 2019). Malaysia requires a significant shift to electric vehicles in order to decarbonize its transportation sector and accomplish its aim of becoming a carbon-neutral nation by 2050 (Selangor Journal, 2022). Hence, this study proposes a conceptual model which is aimed to provide better understanding on the consumers' purchase intention on Evs'.

Theoretical Foundation

As the purpose of this study, a framework from Venkatesh et al. (2012) as shown in figure 1 was adapted as a basis. The Unified Theory of Acceptance and Use of Technology version two (UTAUT2) was to be applied in the context of consumer technologies. The proposed research model includes eight independent variables: performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, with two additional variable, policy measures and environmental concerns. However, in this study habit construct was omitted. Studies in this category did not use 'habit' since the technologies examined were relatively new and in introduction stage of the product life cycle with usage only among early adopters. In order for the consumers to generate habit for particular technology, it needed wider reach among users especially during growth stages of product life cycle.

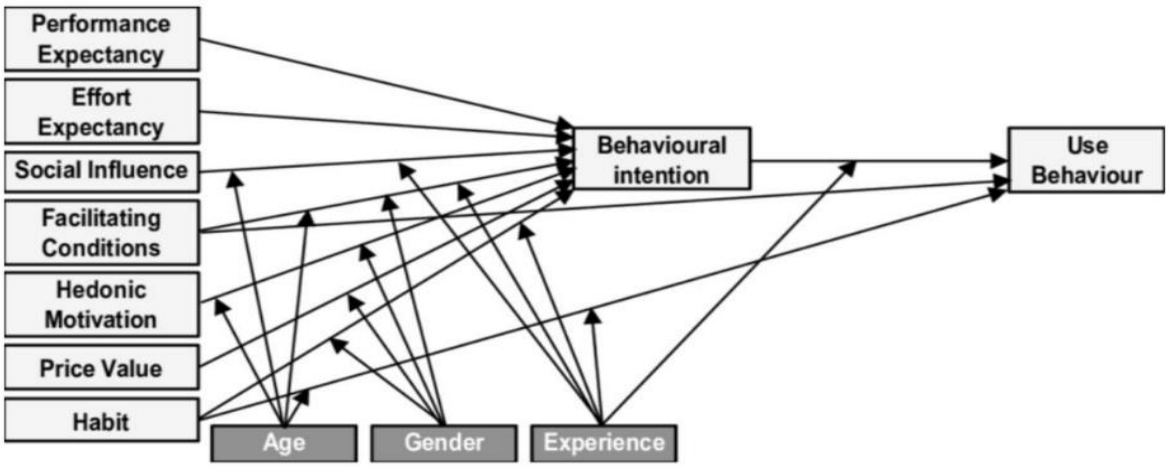

Figure 1. UTAUT2
Source. Venkatesh et al (2012)

Hypotheses Development

Performance expectancy and purchase intention

The performance expectancy of a product shows how useful it is in assisting the user in performing an activity. This is the component with the greatest influence on the intention to engage in the behaviour (Venkatesh et al., 2003). Customers buy certain products primarily for the benefits they provide. In the Malaysian market, Khazaei (2019) found a favourable association between expected performance and intention to buy electric automobiles (Khazaei, 2019). Therefore, it is hypothesized that:

H1: performance expectancy significantly impact purchase intention

Effort expectancy and purchase intention

Effort expectancy shows the customer's view of how easy the product is to use (Venkatesh et al., 2003). According to Tran et al. (2019), effort expectation has a considerable influence on customer intention. The authors claimed that user-friendliness is critical in the context of electric automobiles as a new technology vehicle (Tran et al., 2019). In addition, Wu et al. (2019) stated that the lower the perceived effort required to utilise electric vehicles, the higher the purchase intention of buyers. Therefore, it is hypothesized that:

H2: effort expectancy significantly impact purchase intention

Social influence and purchase intention

The pressure that others put on an individual is referred to as social influence (Venkatesh et al., 2003). Lane and Potter (2007) study revealed that social factors influence consumers' decisions to purchase electric vehicles because they consult with relatives and friends (Lane & Potter, 2007). In the same vein, Peters and Dutschke (2014) study stated that deciding to buy an electric automobile, consumers examine both product attributes and societal effects (Peters & Dütschke, 2014). In the Indian market, Shalender and Sharma (2020) reached similar conclusions, claiming that individuals' ideas are always influenced by society and communities, and hence their intentions and behaviours are influenced by social groups (Shalender & Sharma, 2020). Therefore, it is hypothesized that:

H3: Social influence significantly impact purchase intention

Facilitating conditions and purchase intention

Facilitation refers to the user's assessment of the organizational and physical conditions to support the new technological product (Venkatesh, et al., 2003). Khazaei (2019) argued that favorable conditions supporting the development of electric cars include the availability of charging stations, repair facilities and warranty services (Khazaei, 2019). Sang and Bekhet (2015) pointed out that the biggest disadvantage of electric cars is the travel distance, which requires a widely distributed number of charging stations (Sang & Bekhet, 2015). Scasny et al (2015) stated that charging time and the unavailability of charging stations are the most important barriers to the widespread adoption of electric vehicles in Poland. Therefore, it is hypothesized that:

H4: Facilitating conditions significantly impact purchase intention

Hedonic motivation and purchase intention

Hedonic motivation that drives behavioral intention is the enjoyment of convenience to adopt or use product/service (Venkatesh, et al., 2003). Enjoyment is formed mainly based on the attributes of the vehicle or the internal characteristics and attributes of the vehicle including the design of electric vehicles, the happiness and entertainment of using electric vehicles. For instance, the electric scooter design made electric scooters widely accepted in Taiwan in the 1990s (Chiu & Tzeng, 1999). In addition, Khazaei (2019) explained that the benefits that electric cars bring such as smooth feeling, easy acceleration and no noise help increase efficiency in the driving process of customers by bringing customers the feeling of enjoyment which makes contribution to the purchase intention. Therefore, it is hypothesized that:

H5: Hedonic motivation significantly impact purchase intention

Price value and purchase intention

Economic benefits such as the cost of purchasing an automobile and the cost of operating the vehicle during use are frequently used to determine perceived price values. The cost of purchasing an electric vehicle is frequently higher than the cost of purchasing a traditional fuel vehicle, which is a barrier to the adoption of electric vehicles (Mersky et al., 2016; Knez & Obrecht, 2018). The purchase price of electric vehicles is heavily influenced by battery costs, which is a key impediment to mainstream adoption of electric vehicles. William et al. (2014) study stated that as battery costs fall, electric car competitiveness rises, and this trend is continuing. Therefore, it is hypothesized that:

H6: Price value significantly impact purchase intention

Policy measures and purchase intention

Economic incentives, such as increases in sales tax, have a greater impact on electric car purchase decisions (Jones et al., 2020). Exemption from VAT and sales tax is significant in lowering the cost of purchasing a car and is the strongest incentive in Norway to promote the usage of electric vehicles (Mersky et al., 2016). However, government measures supporting the use of electric vehicles have been ineffective because regulations relating to vehicle prices and fuel expenses were not taken into account. Government policies involving monetary incentives, such as car purchase incentives, electric charging infrastructure incentives, vehicle tax exemptions and subsidies, and non-monetary incentives, such as free tolls and free public charging, can all have an impact on the adoption of electric vehicles. As discussed by (Ranjan et al., 2013) tax subsidies will be more effective in encouraging consumers to buy electric vehicles than other support incentives. The purchase tax exemption can effectively promote the adoption of electric vehicles, but some non-monetary policies such as free parking and use of designated lanes are ineffective (Dill & Rose, 2012). Environmental regulations, petrol price policy, car purchase subsidies and construction of charging infrastructure will affect the market penetration of clean vehicles (Hidrue, et al., 2011). Therefore, it is hypothesized that:

H7: Policy measures significantly impact purchase intention

Environmental concerns and purchase intention

It is believed that the environmental benefits of electric vehicles outweigh those of regular vehicles, impressing buyers and positively influencing their purchasing intentions (Degirmenci & Breitner, 2017). Understanding the environmental repercussions of transportation activities will improve awareness of each individual's duty, prompting people to develop an obligation to safeguard the environment (Asadi et al., 2021). In addition, Asadi et al. (2021) study revealed that as individuals recognise their obligation to safeguard the environment, they become more devoted to environmentally friendly consumption, forming a determinant. Therefore, it is hypothesized that:

H8: Environmental concerns significantly impact purchase intention

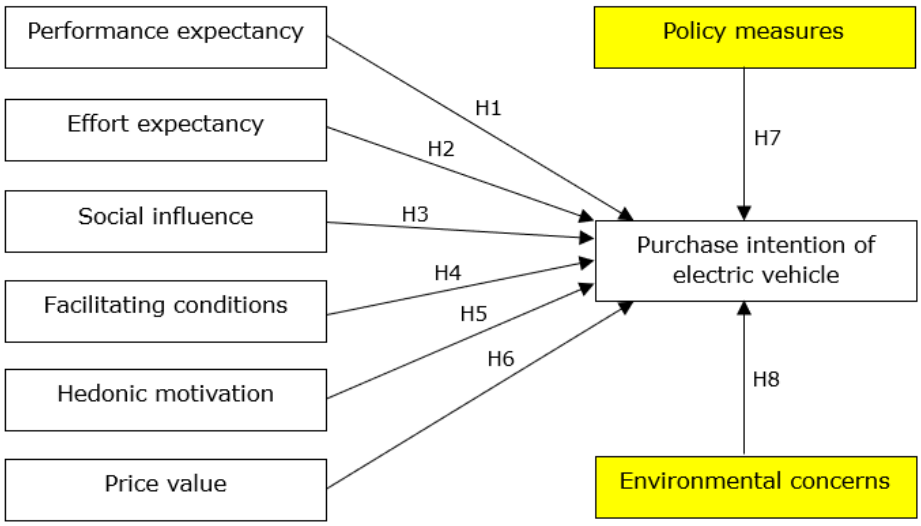

Figure 2. Extended UTAUT

Conclusion

Air pollution poses serious health concerns in dense ASEAN cities specifically Malaysia. Urban transport is increasingly becoming the dominant contributor to this air pollution due to rapid motorization. Since the rate of motorization is already high at current income levels, the potential future impacts on local and global environments from cities with fast-growing economies are causing serious alarm. The implementation of environmentally sustainable cities in Malaysia will be very hard to achieve if the current trend of unsustainable development of cities continues. There is an urgent need to improve environmental performance in many cities in Malaysia. The development of new smart cities can serve to activate new growth engines as well as address various environmental issues and problems. Attaining to produce safe cities and communities by reducing the emission of particulate matter. Despite that limitation, improving existing vehicle emission regulations could provide abatement possibilities, while also improving local ambient conditions. Hence, it is pertinent for this study to identify the robustness and generalizability of the technology acceptance and technology readiness in assisting consumers from buying an electric vehicle.

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