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Yujong Hwang

DePaul University, yhwang1@depaul.edu

Esther Hwang

DePaul University, ehwang10@depaul.edu

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Proposing the Theory of Acceptance and Use of Self-Driving Vehicles

Yujong Hwang
DePaul University
Yhwang1@depaul.edu

Esther J. Hwang
DePaul University
Ehwang10@depaul.edu

ABSTRACT

Automated vehicles (AVs) or self-driving vehicles are important artificial intelligent (AI) technologies of the future and will be essential for future transportation. This study applied the unified theory of acceptance and use of technology (UTAUT) model to study the factors influencing a user's behavioral intention to use AVs. The research model of the study shows that social influence, facilitating condition, E-Wom, and E-Referral will positively affect behavioral intentions towards the AVs. The preliminary data analysis findings of the study are supported. Moreover, These preliminary findings contribute to the AI and robotics adoption theory in terms of adding new factors in the context of human-AI interaction.

Keywords

UTAUT, Self-driving Vehicle, EWOM, Social Influence.

INTRODUCTION

Self-driving vehicles innovation advancement is driving commercialization. Volvo, BMW, and other vehicle producers intend to satisfy self-sufficient driving capacities in numerous vehicle models by 2040 (McKinsey Center for Future Mobility 2019). Bansal and Kockelman (2017) argued that existing examinations foresee that by 2045, self-driving vehicles (explicitly Level 5 computerization without human intercession) might be taken on by 24.8–87.2% of the business. The advancement in self-driving vehicles adoption will bring abundant aids to both individuals and society by improving traffic safety, fuel efficiency, and avoiding Carbon emission completely (Fagnant & Kockelman, 2015). Primarily, self-driving vehicles can minimize up to 90% of collisions by lessening driver faults (Cohen & Hopkins, 2019). Also, self-driving vehicles are fundamental for working on the climate and tackling congestion, they can save 7–15% of fuel utilization by framing detachments, decreasing vehicle proprietorship and parking spots, and upgrading roads size (Yuen, Cai, Qi, & Wang, 2020). In addition, Wang et al. (2019) argued that self-driving vehicles entail fewer human sources of info, empowering clients to perform more useful exercises during their movements. Moreover, older and handicapped people can also get benefits from self-driving vehicles, to use them for mobility (Fagnant & Kockelman, 2015).

Araújo Vila, Fraiz Brea, and Pelegrín Borondo (2021) led an exploration on spa tourism based on Unified Theory of Acceptance and Use of Technology (UTAUT) and further prescribed to contemplate working with facilitating conditions in another scenario. Yuen et al. (2020) investigated the component behind the Chinese cab drivers while adopting electric vehicles and suggested contemplating the effect of social influence on behavioral intention. Yuen et al. (2020) investigated, factors impacting self-driving vehicle adoption based on utilization of the innovation diffusion model and in the future, prescribed to apply another model, for example, UTAUT. Wu et al. (2019) and Wu, Liao, Wang, and Chen (2019) directed an investigation on the job of ecological worry in the public acknowledgment of self-driving electric vehicles in China and further prescribed to contemplate different variables to understand behavioral intention thoroughly. Based on the above directions, this study will identify factors affecting the adoption of self-driving vehicles based on UTAUT. As self-driving vehicle adoption is in a developing stage, this study is an initial endeavor to help in the identification of behavioral intentions towards self-driving vehicles adoption.

HYPOTHESIS DEVELOPMENT

According to the New York Times, 65 percent of new business comes from referrals; indicating that most customers have gained through referrals and not an advertisement (Referral Marketing, 2015). Nielsen (2012) reported that consumers are four times more likely to purchase a product and/or service when referred by a friend, family member, or colleague and not through a salesperson or advert. Hence, a steady stream of referrals can attract profitable customers, and improve customer loyalty (Van-den, 2010).

In addition, customers that come from referrals are more likely to pay full price for a product/service since it was highly recommended by a trusted source, and they believe that they will receive top-notch service (Van-den, 2010). However, Martin and Lueg (2013) stated that electronic word-of-mouth (eWOM) information lacks statistical evidence, and may be viewed as biased and not highly trusted. Therein, the reader's trust in the information may be the only reason she/he uses information from that particular source. In addition, Martin and Lueg (2013) argued that "when WOM is provided via face-to-face interaction, the relationship between evidence and usage is stronger". In our view, eReferral might be more effective since the sender or source is known and trusted by the receiver. Further, strong tie information sources are perceived as more credible than weak tie information sources (Rogers, 1983).

Also, Steffes and Burgee (2009) argued that strong tie information sources are not likely to be used as preferred sources of information. Abubakar et al. (2016) argue that eReferral failed to influence purchase intention. The conflict in the literature provides additional space for more exploration. Thus, the following hypothesis is proposed:

H1: Electronic Referral has a positive effect on purchase intention.

Reza, Jalilvand, and Samiei (2012) argued that eWOM has a strong direct effect on purchase intention. There is a significant positive relationship between eWOM on brand image and purchase intention (Charo et al., 2015; Torlak et al., 2014). Elseidi and El-Baz (2016) argue that eWOM has a significant and positive influence on the consumers' purchasing intention. So, if a person has a positive attitude toward an online review about electric vehicles, that will increase the receiver's purchase intention to products and services discussed favorably in that review. eWOM is an important type of communication that cannot be denied due it is significant effect on consumer behavior while adopting e-vehicle which might be more than the traditional communication tools (Trusov et al., 2009).

With the development of electronic media emerging as a strong and reliable source of information (Shukla, 2011), the influence of interpersonal interactions with eWOM on buying decisions has significantly increased (López & Sicilia, 2014). Online reviews act as strong informants and recommenders and significantly influence the purchase intention and actual purchase (Park et al., 2007). While referring to the eWOM given on various social media channels, it is not only the quality but also the quantity of eWOM that influence the purchase decision of consumers (Lin, Wu, & Chen, 2013).

Lee et al. (2011) examined that the stronger the perceived credibility of online consumer reviews among potential consumers, the higher is the purchase intention. The study further showed that online consumer reviews backed by trust in the online retailer positively influence purchase intention. Kudeshia et al. (2017) also argue that, the effect of WOM on shaping attitudes and affecting consumers' buying intention. Examining the motivation for eWOM among university students, Themba and Mulala (2013) observed that students get engaged in eWOM for seeking opinions which eventually and positively influence their purchase decisions. Examining the effect of online reviews in the tourism industry (Jalilvand & Samiei, 2012b) found that online reviews significantly impact travelers' destination choice. Yaylı and Bayram (2012) found that reading reviews not only positively affect buyers' online buying decisions but also their purchase frequency.

Charo et al. (2015) found in their study that electronic word of mouth has great potential, and both the direct and indirect effects on the intentions of the purchase of the beneficiary as businesses transport the word from the mouth. And the impact of eWOM on the image of the brand can influence and also possibly the levying of beneficiaries of this product/service. Awad and Ragowsky (2008) also be aware of the fact that the quality of the electronic eWOM in a forum has a positive effect on the line of customer trust in a company, which has a positive effect on the proposed acquisition.

H2: Electronic WOM has a positive effect on purchase intention.

Social impact is characterized as the number of other people who accept the client ought to embrace the new framework of technology (Venkatesh et al., 2003). It affects others' discernments about the significance of utilizing electric taxicabs, for example, the individuals who are vital in their lives, like direct relations and companions, associates or simply the people who have significant assessments. In addition, according to the Theory and UTAUT, a bound together theoretical system for electric vehicles ought to remember the effect of social impact on reception behavior. In the context of adopting alternative fuel vehicles, there are critical impacts of relational impact from neighbors, associates, and relatives (Jansson et al., 2017). Martins et al. (2014) tracked down that social impact affected the aim of online clients to take on Internet administrations, while Chaouali et al. (2016) announced that social influence impacts the mentality of each person on the utilization of new creative items through innovation and technology. In a recent research investigation Yang et al. (2021) stated that, in the setting of e-wallet, loved ones have a significant influence on individual outlook to utilize things that are presented through innovation.

H3: Social influence will positively influence purchase intention.

As of late, Zhou, Long, Kong, Zhao, Jia, and Campy (2021) considered, working with facilitating conditions with regards to electric taxicabs is characterized as the availability of facilities that incorporates the client guide for electric vehicles, charging

stations, maintenance facilities, parking garages with charging heaps, and the flexibility of electric vehicles with other hardware. Moreover, with regards to technological items, facilitating conditions have been characterized as how much an individual accepts that they have the vital hierarchical and specialized foundation to utilize a particular innovation or technology (Venkatesh et al., 2003).

In UTAUT, facilitating conditions are additionally thought to be significant factors influencing behavioral intentions toward e-vehicles adaptation (Venkatesh et al., 2012). At the point when users see that circumstances are great for embracing the innovation or technology, behavior can happen (Chung et al., 2015). Hossain et al. (2017) contended that facilitating conditions showed an altogether sure effect on buyers' aim to buy an item. After loving the convenience of using the facilities offered by service providers that ease payments and transactions, users are likely to start to continue the use of that services or technology. Tarhini et al. (2016) asserted that facilitating conditions empower clients to innovatively utilize the e-learning framework so the clients become savvy and consistently update new menus in the application.

In addition, Peñarroja et al. (2019) affirmed that in this computerized period facilitating conditions positively affects the information sharing behavior of utilizing technology. These findings ensured that consumers are likely to participate in virtual communities when facilitating conditions exist. Specifically, in the context of spas, many studies have demonstrated the importance of facilitating conditions for choosing a spa during a trip. However, Klaysung (2016), for instance, highlighted parking space availability and the absence of traffic jams as important spa selection criteria for tourists in Thailand.

H4: The facilitating condition has a positive effect on purchase intention.

In this research study factors affecting the adoption of the self-driving vehicle will be examined. Factors include e-referral, eWOM, social influence, facilitating condition, and its effect on behavioral intentions.

FUTURE RESEARCH

This study will be conducted in the context of the auto mobile industry and precisely, focused on self-driving vehicles adoption. Most of the consumers are not well aware of the benefits of self-driving vehicles while some others don't know how to use these services. This study will test four factors: e-referral, eWOM, social influence, and facilitating condition. UTAUT is an important model for user's adaptation. This study will contribute to two more factors in the literature of UTAUT, which are eWOM and e-referral. Both factors play an important role in the adoption of self-driving vehicles adoption.

This study will contribute to the existing body of knowledge on consumer behavior while adopting new technologies because it has explored the antecedents of behavioral intention towards self-driving vehicles based on UTAUT. This research study will be also valuable for auto sector managers as the results confirmed the factors, which influence behavioral intentions. The manager of the auto industry should consider these factors to build a positive behavior of the consumer to achieve its goal. Managers should apply new factors, such as e-referral and eWOM to increase the awareness of the consumer about the self-driving vehicle's feature and its importance for safety and security.

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