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An Empirical Study of the Synergistic Effect of the Theory of Planned Behaviour (TPB) & Unified Theory of Acceptance and Use of Technology (UTAUT) with Reference to the Purchase Intention of Electric Vehicles (EVS)

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ABSTRACT

Integrating two theories to explain the phenomenon of consumer intention for purchasing electric vehicles offers a more comprehensive and nuanced understanding. This research is the first of its kind, where we integrated two theories of consumers' purchase intention (TPB and UTAUT) to obtain their synergistic effect. We combined these two theories because their variance inflation factor (VIF) was greater than 5. We tested the constructs of TPB theory (Attitude toward the behavior, subjective norms, and perceived behavioral control), along with the constructs of UTAUT (performance expectancy, effort expectancy, social Influence, and facilitating conditions), taking a sample size of (N=378) and by applying structural equation modelling. First, we examined TPB and UTAUT theories separately, then combined them to get their synergistic effect. Our research found that the effect of TPB and UTAUT theory on purchase intentions of consumers was found to be less effective when applied individually (R2=0.649 with TPB theory and R2=0.769 with UTAUT theory) as compared to when these two theories were combined, resulting in their synergistic effect (R2=0.946). We also found that integrating TPB and UTAUT enhances explanatory power, improves the prediction of consumer adoption behavior, balances psychological and technological determinants, and provides stronger practical guidance for organizations and policymakers. Our outcome also explains why individuals adopt and use technology to purchase EVs. Our findings provide EV marketers with better predictions and more effective marketing strategies, especially in the context of e-commerce and cross-border transactions. The paper also discussed the limitations and directions for future research.

Keywords: Theory of Planned Behavior, Theory of Unified Theory of Acceptance and Use of Technology, Consumer intentions, Electric vehicles.

INTRODUCTION

In an increasingly complex world, relying on a single theory may be insufficient, potentially overlooking other vital factors, and integrating perspectives ensures a richer and more accurate account of the phenomenon under study. By combining theories, researchers can address gaps and limitations, enhance explanatory power, and capture the complexity of real-world phenomena (Tashakkori & Teddlie, 2010). Such theoretical integration also promotes interdisciplinary thinking and supports the development of practical applications, such as more effective interventions or policies (Bacharach, 1989). Moreover, this approach encourages critical evaluation and refinement of existing theories, advancing theoretical and empirical knowledge. We conduct this research, which is the first of its kind, where we integrate two theories related to the purchase intention of electric vehicles to get their synergistic effect.

According to Ajzen (1985), EV purchase intention is influenced by: Attitude toward EVs (e.g., eco-friendly, cost savings), subjective norms (Influence from family, peers, society), and perceived behavioral control (charging infrastructure, affordability). Extensions in EV studies often include: environmental concern,

government incentives, and perceived innovation. This theory, developed by Schwartz (1977), focuses on the moral obligation to act sustainably. According to this theory, EV adoption is driven by awareness of consequences (e.g., pollution from gasoline cars), ascription of responsibility (feeling personally responsible), and personal norms (internalized values supporting eco-friendly behavior). The other theory is Stern's (2000) value-belief-norm theory of environmentalism. This theory builds on NAM and adds values as antecedents. The core beliefs of EV intention are environmental values and belief in human impact on green purchase intentions. Another theory is the technology acceptance model (Davis, 1989). We apply the theory for EVs as a form of sustainable innovation, and the key drivers are usefulness (e.g., fuel efficiency, low maintenance), perceived ease of use (charging convenience, driving range), risk perception, and trust in EV technological compatibility with lifestyle. The Unified Theory of Acceptance and Use of Technology (UTAUT / UTAUT2) predicts adoption of technology (adapted for EVs), performance expectancy, effort expectancy, social Influence, and conditions (e.g., charging network availability). The Diffusion of Innovation (DOI) theory by Rogers (1962) states that adoption of EVs is based on innovators, early adopters, early majority, etc. The five innovation attributes are relative, compatibility with user values/lifestyle, complexity (ease of understanding/using EVs), traceability, and serviceability (seeing others use EVs). These theories help explain how different consumers adopt EVs over time.

Reasons to choose an Electric vehicle for testing the theory

We chose EV to test this theory because the constructs of both the theories of consumer intentions (TPB and UTAUT) were significantly involved in the purchase intentions of EVs. The constructs of the first theory incorporate the planning aspects, and the constructs of the second theory incorporate the technological aspects. The other reason to choose EVs was for practical applicability, as the demand for EVs has grown exponentially in the last 3 years. Various countries are promoting EVs due to reports that approximately 90% of the global population breathes air contaminated with pollutants, leading to an estimated 7 million deaths annually. A significant factor driving environmental pollution is the rapid increase in automobile usage (World Health Organization, 2019). Significantly, nine of the ten most polluted cities in the world are located in India (World Health Organization, 2018). As a rapidly developing country, India is experiencing fast-paced urbanization, which has led to greater dependence on motorized Transport for mobility (Murugan & Marisamynathan, 2022). Data from Niti Aayog (2021) reports India to be the second-largest emitter of CO2. Carley et al. (2013), Moons and De Pelsmacker (2012), Diamond (2009), and Lane and Potter (2007) have highlighted how consumers have started opting for EVs. Previous researchers, such as Egbue, Ona, Long, Suzanna, (2012), She et al. (2017), Wang et al. (2017), and Sierzchula et al. (2014), focused on the use of EVs and their increasing market share. Another reason to choose EV for testing the combined theory was that many researchers like Graham-Roweet, et.al, (2012), Burgess,et. al (2013), He, et al.(2020), Sierzchula, et, al. (2014), She et al. (2017), and Carley et al. (2013), had already conducted a field study of Shoppe marketplace users in Indonesia by combining the two theories (TAM and TPB) to predict online purchase intentions of consumers. They used constructs like perceived ease of use, i.e., Attitude, subjective norm, and perceived behavioral control. They found that perceived usefulness, subjective norms, and PBC all positively impacted consumers' purchase intentions. After reviewing the literature of more than 50 papers, we found that none of the research examined the combined theory of TPB and UTAUT theory of purchase intentions on the purchase of electric vehicles. This research is the first of its kind in which two theories, TPB and UTAUT, were combined to see their synergistic effect on purchase intentions of electric vehicles.

Theory of planned behaviour (TPB)

To help people understand how consumers make decisions, Ajzen (1985) developed the theory of planned behavior. This theory is an extension of the theory of reasoned action (TRA). It explains how attitudes, social pressures, and perceived control shape an individual's intention to perform a behavior, predicting actual behavior. Ajzen (1985) created the section on perceived behavioral to help researchers better understand it. Within the TPB, attitudes, subjective norms, and perceived norms can directly or indirectly impact intentions. Since TPB effectively describes consumer behavior and intentions, many researchers have focused on reducing pollution, household energy-saving intentions, intentions to purchase green products, and intentions and behaviors related to environmental protection. In accordance with the theory of planned behavior (TPB), individuals evaluate their actions and the results they produce directly influence an individual's purchase intentions (Ajzen, 1991). (Lane, et. al, 2007) used value belief-norms and plan behavior to investigate the lives of potential buyers of electric cars in the United Kingdom. Some studies that tried to forecast or explain why consumers would accept eco-friendly vehicles used TPB theory. TPB has also been used to study innovation behavior (e.g., Pickett-Baker, et. al, 2008; Moons and De Pelsmacker, 2012). According to Moons and De Pelsmacker (2012), Attitude is not the only factor that affects customers' inclinations and motivations; instead, customer information is key to TPB design. Considering the above literature review, we hypothesize the following:

- H1: Attitude toward the behavior affects the purchase intention of EV positively
- H2: Subjective norms affect the purchase intention of EV positively
- H3: Perceived behavioral control affects the purchase intention of EV positively

Unified Theory of Acceptance and Use of Technology (UTAUT)

Venkatesh, et. al, (2003) introduced the Unified Theory of Acceptance and Use of Technology (UTAUT) theory to bring together disparate theories in adopting technology. The purpose of this model is to explain why users choose to use technology and how they use it. Venkatesh, et. al (2003) created the UTAUT model after combining seven models. Within the framework of UTAUT, Venkatesh et al. (2003) used constructs like social influence, performance expectancy, effort expectancy, and facilitating conditions. The competing models currently in use have led to a redefinition of these four constructs. PE describes explicitly how much a person thinks that utilizing the system will enable them to improve their performance at work. In terms of system usability, EE stands for ease of use. FC reflects the belief that a technical and organizational infrastructure is in place to facilitate system use. The UTAUT model's extensive use in various fields has proven its broad applicability. Researchers have used it to investigate how well-received different technologies, such as the internet of things (Scur et al., 2023), products utilizing artificial intelligence (Al-Sharafi et al., 2023), and electronic health technology (Cobelli et al., 2023; Terblanche & Kidd, 2022), have been in their research. Various research was conducted on the UTAUT by many researchers such as Attuquayefio & Addo (2014); Chang (2012); Williams et al. (2011); Williams et al (2015), as well as meta-analyses by Blut et al. (2022); Dwivedi et al. (2011); Faaeq et al (2013); Taiwo & Downe (2013). Williams et al. (2015) review is notable for being one of the most thorough evaluations of UTAUT's application among the earlier studies. Their analysis specifically looked at several important aspects, such as the prevailing technologies and information systems, the demographic profiles of research participants, methodological trends in UTAUT research, integration with complementary models, and the results of testing hypotheses in the UTAUT-based studies.

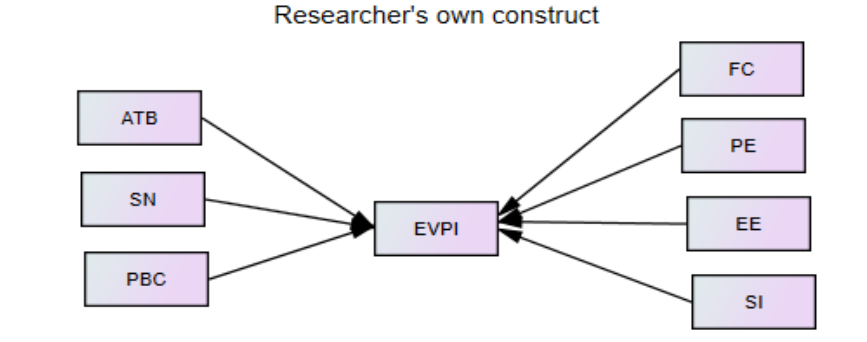
The adoption of e-government (Amrouni et al.,2019), the adoption of remote medical technology (Rouidi et al., 2022; Malik, 2021), smartphone technology (Ahmed et al., 2023), mobile applications (Kamal & Subriadi, 2021), m-commerce (Imtiaz, 2018), information systems (Alghatrifi & Khalid, 2019), and mobile payments (Al-Saedi & Al-Emran, 2021) were some of the research conducted on purchase intentions of electric vehicles. The UTAUT model, second only to TAM in education, has become a prominent model for technology acceptance (Granić, 2022). This theory has been used in educational chatbots and other educational technologies (Bilquise et al., 2023), mobile learning (Chao & Chen, 2023), and e-learning platforms (Patil & Undale, 2023). UTAUT is a leading framework for comprehending the variables affecting technology adoption in various contexts. Im et al. (2011) examined UTAUT in various nations, including China and South Korea. They discovered that cultural variations affect the strength of the constructs, indicating that localization is important when using the model. Dwivedi et al. (2011) performed a meta-analysis of UTAUT applications and discovered its extensive use in mobile banking, e-learning, healthcare IT, and e-government fields.

Based on the above literature, we hypothesize the following:

- H4: Performance Expectancy affects the purchase intention of EV positively
- H5: Effort Expectancy affects the purchase intention of EV positively
- H6: Social Influence affects the purchase intention of EV positively
- H7: Facilitating Conditions affect the purchase intention of EV positively

Following Diagram no.1 is the researcher's own construct:

Diagram no.-1



ATB - Attitude toward the behavior, SN - Subjective norms, PBC- Perceived behavioral control, PE - Performance Expectancy, EE- Effort Expectancy, SI - Social Influence, and FC - Facilitating Conditions, EVPI - Electric Vehicle purchase intention

RESEARCH METHODOLOGY

Research Design

The present research adopts a quantitative approach, employing Structural Equation Modelling (SEM) to test the proposed relationships between the selected constructs. We considered SEM appropriate because it enables them to concurrently

assess both measurement models (validity and reliability of the constructs) and structural models (the hypothesized causal pathways). This dual capability makes SEM suitable for comprehensively addressing the study's objectives.

Population and Sampling Procedure
The study population consisted of EV users aged 18 to 45 in the selected regions in India, including demographic traits like age, gender, and level of education. A convenience sampling was applied to ensure appropriate representation of the population. Following recommendations for SEM applications (Hair et al., 2014), a minimum of 200 participants is considered necessary for reliable parameter estimation. The final data set comprised 378 valid responses, which was adequate for our analysis.

Data Collection
The survey data was obtained by the EV users aged 18 to 45 in the selected regions in India, including demographic traits like age, gender, and level of education, to find the impact of both the theories mentioned above on consumers' purchase intention. We used Smart PLS to measure the indicators of both the theories used in the study. Furthermore, these data were processed and evaluated. We obtained primary data using a structured questionnaire featuring items measured on a five-point Likert scale. (1 = Strongly Disagree to 5 = Strongly Agree). The instrument was adapted from previously validated measures to ensure accuracy and content validity. We conducted a pilot study with participants to refine the questionnaire, confirm the items' reliability, and ensure respondents' clarity. The first section examined demographic traits like age, gender, and level of education. The second section of our study included Attitude toward the behavior, subjective norms, perceived behavioral control, performance expectancy, effort expectancy, social Influence, and facilitating conditions. We distributed both online and offline versions of the surveys to the EV car-buying groups. We employed a Google form to gather samples from the participants. We eliminated a few surveys containing logical errors or the same responses to most questions. Finally, we gathered 378 valid questionnaires from both online and offline surveys.

Data Analysis Strategy
The dataset was analyzed using SEM through SmartPLS. The analysis adhered to the two-step procedure outlined by Anderson and Gerbing (1988): First, we assessed the measurement model, followed by confirmatory factor analysis (CFA) to evaluate construct validity. We established Convergent validity through factor loadings (>0.50), Average Variance Extracted (AVE > 0.50), and Composite Reliability (CR > 0.70).

We tested discriminant validity using the Fornell–Larcker criterion and the HTMT ratio.
The adequacy of the model was judged based on fit indices such as χ^2/df (<3.0), CFI (>0.90), TLI (>0.90), RMSEA (<0.08), and SRMR (<0.08).

Assessment of the Structural Model
We examined the hypothesized paths among latent constructs using path analysis. Then we determined the significance of path coefficients through t-values and bootstrapping with 5,000 resamples. Finally, we assessed the Explanatory power using R^2 values of the endogenous constructs.

Research question
Our research question was - Can we get a synergistic effect after combining TPB and UTAUT theory, considering EVs?

Research objective
Our research objective was to combine two theories to influence the consumer's intention to buy an electric vehicle.

Ethical Considerations
We strictly followed the ethical protocols throughout the research. Participants were informed about the study's aim, assured confidentiality, and participation remained voluntary. We did not collect personal or identifiable information, ensuring respondents' anonymity and privacy.

Data analysis and results
We first tested the TPB theory and the UTAUT theory separately, and then we combined both theories to assess their synergistic effect. We used a structured questionnaire to conduct our study. According to the data, 67.3% of those surveyed were men. However, different responses came from different age ranges. For example, the age group of 20 to 24 had the lowest response rates. Forty-two percent of the respondents were undergraduate students. PhD students accounted for the lowest of the total.

FINDINGS AND ANALYSIS
Findings and analysis by incorporating TPB theory
The first step in this investigation was to perform a reliability test on the survey data. In order to determine the consistency and dependability of the questionnaire, we conducted a reliability test. We used SPSS v26.0 to analyze the validity of the scale's data. Our findings were as follows: Attitude toward the behavior (α=0.855, CR=0.890), subjective norms (α=0.862,

CR=0.891), perceived behavioral control (α=0.973, CR=0.979), and EVPI (0.901, CR=0.927). We found HTMT and outer loading to be statistically significant. The value of all extracted average variances was>0.5. Diagram no. 2 shows that outer loading is above 0.7, the Beta coefficient is above 0.2, and R2=0.649. Beta coefficient for SN was highest (0.471). If 0.471 is the highest beta coefficient among all the variables in the model, it signifies that this independent variable has the most potent positive effect on the dependent variable. In other words, it is the best predictor of the outcome among all the variables in the regression. A R-square of 0.649 in a Structural Equation Model (SEM) means that approximately 64.9% of the variance in an endogenous (dependent) variable is explained by the predictor variables in the model. The remaining 35.1% of the variance is unexplained by the model and is attributed to other unrelated factors.

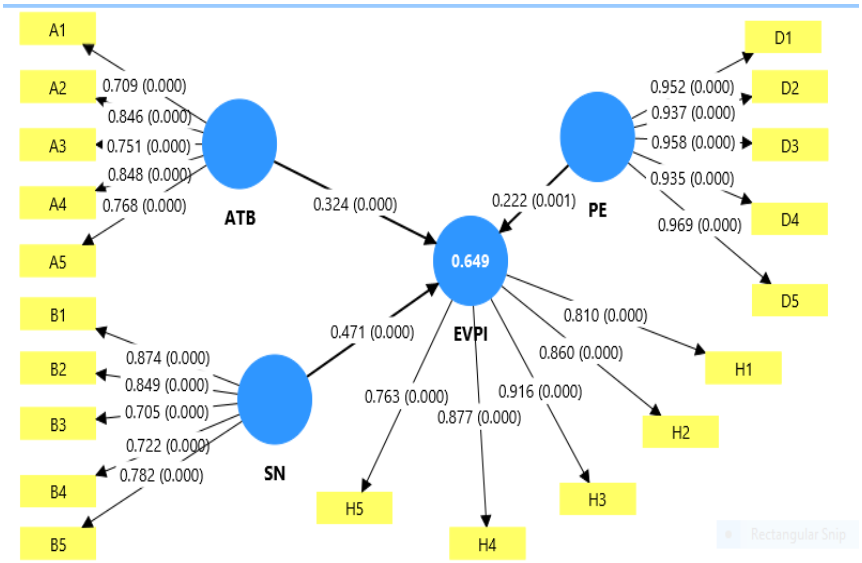


Diagram no. 2 (Constructs of TPB theory and EVPI)

(ATB- Attitude toward the behavior, SN- Subjective norms, PE- Perceived behavioral control, EVPI- Electric vehicle purchase intention)

Findings and analysis by incorporating the UTAUT theory

The first step in this investigation was to perform a reliability test on the survey data. In order to determine the consistency and dependability of the questionnaire, we conducted a reliability test. We used SPSS v26.0 to analyze the validity of the scale's data. Our findings were as follows- Performance Expectancy (α=0.973, CR=0.974), Effort Expectancy (α=0.786, CR=0.832), Social Influence (α=0.971, CR=0.974), Facilitating Conditions (α=0.892, CR=0.928 EVPI (=0.901, CR=0.905). We found HTMT and outer loading to be statistically significant. We found that all extracted average variance values were >0.5. The diagram no.3 shows that outer loading is above 0.7, Beta value is above 0.2, and R2=0.769. We found the Beta value for EE to be the highest (0.349). Since 0.349 is the highest beta value, it indicates that "EE" has the strongest predictive power among all the variables in the model—a one-unit change in EE results in a 0.349-unit change in the dependent variable. In Structural Equation Modeling (SEM), an R-square value of 0.769 for an endogenous (dependent) variable means that the predictor variables in your model explain 76.9% of the variance in that variable. The remaining 23.1% is attributed to other variables not included in the model or to unexplained, random variance.

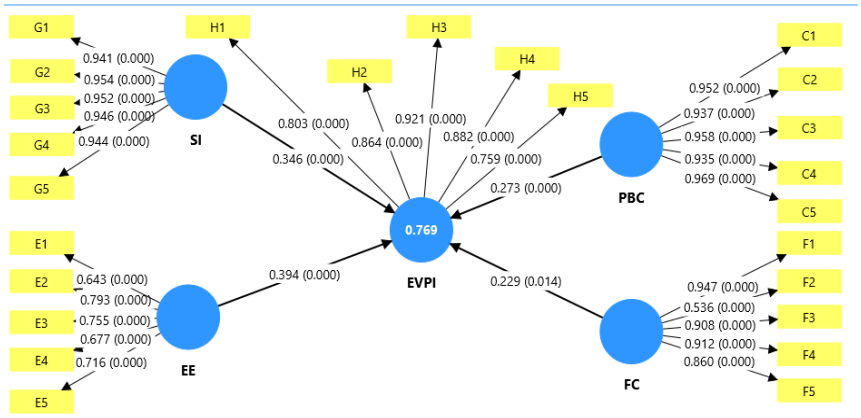


Diagram no. 3 (Constructs of UTAUT theory and EVPI),

(SI- Social influence, EE- Effort Expectancy, PBC- Performance Expectancy, FC- Facilitating conditions, EVPI- Electric vehicle purchase intention)

Findings and analysis of TPB and UTAUT theory combined

Construct Reliability and Validity

The first step in this research was to perform a reliability test on the survey data. In order to determine the consistency and dependability of the questionnaire, we conducted a reliability test. Our findings were as follows- Attitude toward the behavior (α=0.981, rho_a=1.037, rho_c=0.985, & AVE=0.928), Subjective norms (α=0.972, rho_a=0.980, rho_c=0.978, & AVE=0.899), Perceived behavioral control (α=0.978, rho_a=0.983, rho_c=0.983, & AVE=0.920), Performance Expectancy (α=0.955, rho_a=0.968, rho_c=0.965, & AVE=0.848), Effort Expectancy (α=0.978, rho_a=0.978, rho_c=0.983, & AVE=0.919), Social Influence (α=0.985, rho_a=0.989, rho_c=0.988, & AVE=0.944), and Facilitating Conditions (α=0.969, rho_a=0.974, rho_c=0.976, & AVE=0.889). These findings suggest that the survey had strong convergent validity. Hair t al. (2014) also mention that the value of α greater than 0.981 is considered better. Our AVE value was greater than 0.5. According to Fornell & Larcker (1981), the AVE value should be above 0.5. A further study involved performing confirmatory factor analysis using Smart PLS to assess the measurement and structural models. Two essential elements of structural validity are convergent and discriminant validity, which in our study were higher than 0.50, and all extracted average variance values were >05. Table no. 1 shows the details of construct reliability and validity:

Table no-1 Construct reliability and validity

Construct reliability and validity - Overview — Copy to Excel/Word

	Cronbach's alpha	Composite reliability (rho...	Composite reliability (rho_c)	Average variance extracte...
ATB	0.981	1.037	0.985	0.928
EE	0.978	0.978	0.983	0.919
EVPI	0.990	0.990	0.992	0.962
FC	0.969	0.974	0.976	0.889
PBC	0.978	0.983	0.983	0.920
PE	0.955	0.968	0.965	0.848
SI	0.985	0.989	0.988	0.944
SN	0.972	0.980	0.978	0.899

Discriminant validity

According to Brown (2006), discriminant validity is valid when the value of HTMT is less than 0.9. Table 2 below shows the value of HTMT of each construct.

Table no-2

Discriminant validity - Heterotrait-monotrait ratio (HTMT) - Matrix

	ATB	EE	EVPI	FC	PBC	PE	SI	SN
ATB								
EE	0.100							
EVPI	0.052	0.545						
FC	0.048	0.071	0.465					
PBC	0.326	0.052	0.260	0.035				
PE	0.061	0.158	0.216	0.035	0.135			
SI	0.093	0.085	0.491	0.049	0.031	0.028		
SN	0.035	0.050	0.269	0.047	0.119	0.057	0.059	

Furthermore, we confirmed the measurement's validity by finding that the square root of the Average Variance Extracted for each construct was higher than the correlation value According to Chin & Salisbury (1997) if all factors of the theoretical model are statistically significant, then its validity and reliability (convergent and discriminant) are good.

Model fit test

Using the structural equation model, researchers can use some observable indicators to measure non-observable variables. They can evaluate the structural model with a wide range of indicators. Accordingly we looked at the theoretical model and the previously mentioned hypotheses to ascertain how product perception, attitude, and perceived behavioral control affected the buying intent of EV consumers. The significance of the pertinent path coefficient was employed to ascertain the extent to which each variable influenced EV purchase intention. We determined the proposed theoretical framework based on CFA analysis to satisfy validity and reliability requirements. Following that, we examined data for goodness of fit using structural validity. We initially found a good model fit while conducting structural analysis. Our SRMR value was near zero; according to Anderon & Gerbing (1988), a SRMR value near zero is considered significant. Below table no. Figure 3 shows the significant value of SRMR.

Table no-3

SRMR

	Original sample (O)	Sample mean (M)	95%	99%
Saturated model	0.037	0.037	0.052	0.114
Estimated model	0.037	0.037	0.052	0.114

Our findings in Table 4 show that the values of all the constructs on EVPI are significant, including behavioral issues integrated with technological aspects. The value of R-squared is given below in Table 4. Our result shows that if TPB and UTAUT theories are combined, the outcome can be better (R2=0.946) than the theories used individually. An R2 of 0.946 suggests that the independent latent and/or observed variables are very effective at predicting and explaining the variation in the dependent variable. The model has a very strong goodness-of-fit for that particular part of the model. We found the Beta coefficient for EE to be the highest (0.484). In Structural Equation Modeling (SEM), a standardized beta coefficient of 0.484, being the highest in a model, means that the corresponding independent variable has the most potent effect on its related dependent variable.

Table no -4

R-square - Mean, STDEV, T values, p values — Copy to Excel/Word

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
EVPI	0.946	0.945	0.015	61.789	0.000

Our findings in diagram no.4 show that there is a substantial impact of an exogenous variable on an endogenous variable. ATB on EVPI (F2=0.669, p<0.001), EE on EVPI (F2=4.107, p<0.001), FC on EVPI (F2=3.403, p<0.001), PBC on EVPI (F2=2.300, p<0.001), PE on EVPI (F2=1.971, p<0.001)

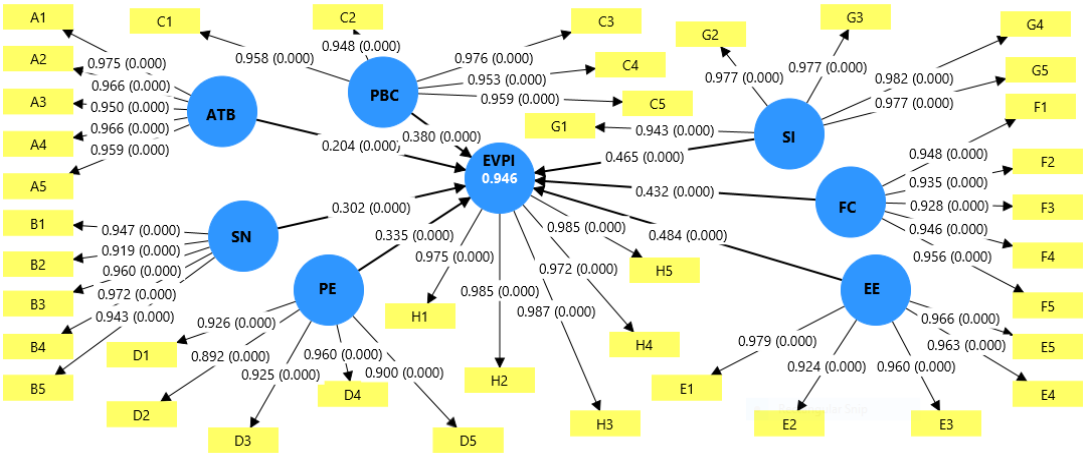


Diagram No-4, Model fit: (Value of R square (combined) along with its P-value is given in the PLS diagram)

Table 5 below shows that the value of F-squared is significant as the P values are within the specified value. For ATB->EVPI (F2=0.669), for EE->EVPI (F2=4.107), for FC->EVPI (F2=3.403), for PBC->EVPI (F2=2.300), for PE->EVPI (F2=1.971), for SI->EVPI (F2=3.881) and for SN>EVPI (F2=1.651).

Table no-5

f-square - Mean, STDEV, T values, p values — Copy to Excel/Word | Copy to R

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
ATB -> EVPI	0.669	0.643	0.274	2.442	0.007
EE -> EVPI	4.107	4.032	1.071	3.836	0.000
FC -> EVPI	3.403	3.324	0.867	3.924	0.000
PBC -> EVPI	2.300	2.213	0.699	3.291	0.001
PE -> EVPI	1.971	1.908	0.558	3.532	0.000
SI -> EVPI	3.881	3.740	0.947	4.100	0.000
SN -> EVPI	1.651	1.613	0.529	3.121	0.001

Path coefficient value is given in Table 6 below:

The value of Beta in Table 6 shows that the strength of all the constructs is statistically significant. We found that effort expectancy and social influences contributed the most among other constructs for the purchase of electric vehicles.

Table no. 6

Path coefficients - Mean, STDEV, T values, p values — Copy to Excel/Word | Copy to R

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
ATB -> EVPI	0.204	0.196	0.045	4.578	0.000
EE -> EVPI	0.484	0.481	0.044	11.120	0.000
FC -> EVPI	0.432	0.428	0.044	9.795	0.000
PBC -> EVPI	0.380	0.373	0.053	7.238	0.000
PE -> EVPI	0.335	0.329	0.042	8.051	0.000
SI -> EVPI	0.465	0.461	0.047	9.895	0.000
SN -> EVPI	0.302	0.297	0.038	7.886	0.000

Factors affecting Electric Vehicle purchase intention (EVPI)

All of the hypotheses tested positive, according to the results, which implies that all factors positively affect Indian consumers' intentions to make purchases of electric vehicles.

Electric Vehicle purchase intention with Attitude toward the behavior

We found that attitude toward the behaviour (AT) had a significant impact on the intention to buy an electric vehicle ($\beta = 0.204$, $p < 0.001$). Customers with positive AT about electric cars are more likely to buy them. According to the preliminary findings of TPB's model, AT significantly predicts PI. These findings are in line with an earlier study by Ajzen (1991), that showed AT is a good indicator of purchase intention among consumers.

Electric Vehicle purchase intention with subjective norm

The findings of our study indicate that EV purchase intent was positively influenced by subjective norm ($\beta = 0.302$, $p < 0.001$). Our result is in accordance with the findings by Lopez-Mosquera et al. (2014), which state that subjective norms significantly influenced the consumer's purchasing intentions. However, one of the studies by Moons and De Pelsmacker (2012) demonstrated that subjective norms had minimal effect on actual behavior or purchase intent.

Electric Vehicle purchase intention with perceived behavioral control (PBC)

The findings indicate a positive relationship between behavioral control perceptions and intentions to purchase electric vehicles ($\beta = 0.380$, $p < 0.001$). As per the study conducted by Moons and De Pelsmacker (2012), electric vehicle buyers are more likely to prove their confidence and ability to make the purchase. As per the original TPB Model, PBC is a significant predictor of purchase intention of electric vehicles. Our result shows that PBC is one of the most reliable indicators of the intention to engage in environmentally friendly behavior.

Electric Vehicle purchase intention with Performance Expectancy

The Performance Expectancy factor positively impacted customers' electric car Purchase intention ($\beta = 0.335$, $p < 0.001$). This is in line with prior research of performance expectancy having a positive correlation with EV purchase intention (Venkatesh et al., 2003)

Electric Vehicle Purchase Intention with Effort Expectancy

Effort Expectancy positively influences electric vehicle purchase intentions, but the effect is not as strong ($\beta = 0.484$, $p < 0.001$). The outcome demonstrates how consumers' effort expectancy regarding EV product attributes impacts their decisions to buy electric vehicles.

Electric Vehicle Purchase Intention with Social Influence

According to our study, Social Influence significantly impacts EV buying intention ($\beta = 0.465$, $p < 0.001$). The effect of social Influence is significant when the use of technology is mandated, as stated by Venkatesh et al. (2003). In the

mandatory context, individuals may use technology due to compliance requirements, but may not use it owing to personal preferences. When employees in organizations use technology, users do not feel responsible for the cost associated with the use of technology due to the lack of direct financial implications.

Electric Vehicle purchase intention with Facilitating conditions (FC)

Facilitating conditions like technical infrastructure, including the facility of battery charging stations, positively impact EV buying intention ($\beta = 0.432$, $p < 0.193$). Wang et al. (2017) looked into the factors influencing Chinese consumers' inclination to purchase electric vehicles and found that electric car has numerous advantages over buying one with internal combustion. Previous research by Venkatesh et al. (2003) confirms that facilitating conditions directly affect EVs' purchase intention.

Table No. 7 shows our study's total effects along with T and P values. Our study found the total effect of ATB->EVPI was 0.204, EE->EVPI (0.484), FC->EVPI (0.432), PBC->EVPI (0.380), PE->EVPI (0.335), and SI->EVPI (0.465), SN->EVPI (0.302). We found the total effect of all the variables on EVPI statistically significant. The table below. 7 shows the total effect along with their P values:

Table no.7

Total effects - Mean, STDEV, T values, p values — Copy to Excel/Word | Copy to R

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
ATB -> EVPI	0.204	0.196	0.045	4.578	0.000
EE -> EVPI	0.484	0.481	0.044	11.120	0.000
FC -> EVPI	0.432	0.428	0.044	9.795	0.000
PBC -> EVPI	0.380	0.373	0.053	7.238	0.000
PE -> EVPI	0.335	0.329	0.042	8.051	0.000
SI -> EVPI	0.465	0.461	0.047	9.895	0.000
SN -> EVPI	0.302	0.297	0.038	7.886	0.000

CONCLUSION, RECOMMENDATIONS AND LIMITATIONS:

This study developed a model that highlights the mechanism influencing purchase intention for EVs using the combined theory of planned behavior (TPB) and the UTAUT. Various constructs emanating from both the theories - Attitude toward the behavior, subjective norms, perceived behavioral control, performance expectancy, effort expectancy, social Influence, and facilitating conditions, were considered. We distributed a questionnaire to potential clients in the selected states in India. There were 378 valid survey answers in all. We first tested the TPB and UTAUT theories separately, and then we tested them by combining both theories. We found that these two theories give less desired effect on consumers' purchase intentions of Electric vehicles when applied individually (R2=0.649 with TPB theory and R2=0.769 with UTAUT theory), but become complementary to each other and give a synergistic effect when combined (R2=0.946). These two theories, when combined, offer a more nuanced and comprehensive understanding of why individuals adopt and use technology for purchasing electric vehicles. Moreover, integrating TPB and UTAUT enhances explanatory power, improves the prediction of consumer adoption behavior, balances psychological and technological determinants, and provides stronger practical guidance for organizations and policymakers. No factors tested negative, and most of the factors had a significant positive impact on consumers' intentions to purchase electric vehicles, according to our results. Our research contributes to the theory of purchase intentions among consumers by combining the two theories of consumer behavior (TPB & UTAUT) to get their synergistic effect. Our research also contributes to the practical application of this combined theory. Marketing professionals can use these two theories (TPB & UTAUT) to get a synergistic effect on the purchase intentions of electric vehicle consumers. This research has two limitation. First we confined the research survey to limited parts of India (Jharkhand, Bihar, and Uttar Pradesh); therefore, further research can be conducted by considering the population of the other states. Secondly we did not test in depth for other theories of purchase intentions; therefore, further research can be conducted by combining other theories of purchase intentions and then finding their synergistic effect. Combining other theories of purchase intentions may give different results than ours.

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