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A Comprehensive Systematic Review on Electric Vehicle Adoption with the Impact of Technological and Consumer Buying Behavior

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Abstract: ***This paper presents a systematic literature review (SLR) focused on electric vehicle (EV) adoption to portrait the consumer purchase behavior. Drawing from multiple academic databases, 55 peer-reviewed articles published between 2015 and 2025 were analyzed and incorporated the ideas that have been dealt in the topic. The review paper consists of the comprehensive review of different methodologies used for the study of electric vehicle buying behaviour of the Indian people. The review identifies and synthesizes key behavioural factors, theoretical frameworks, and research trends. The findings indicate that psychological, social, economic, and contextual factors significantly influence the EV adoption decisions for buyers. Additionally, the review signifies the emerging themes such as psychological ownership, range anxiety, and charging infrastructure accessibility and customer preference and also includes the gaps in the literature and shows the future research direction are also discussed and embedded in this paper.***

Keywords: Electric vehicles; technology; Self-identity; consumer behavior; policy frameworks.

I. INTRODUCTION

The most important aspect of international attempts to slow down global climate change is the switch from conventional Internal combustion engine (ICE) vehicles to electric vehicles (EVs). A number of factors, such as environmental concerns like climate conditions, EV government policies drafted in India, and the developments in technology and charging infrastructure are driving the adoption of EVs among the buyers . Though supply-side advances have been fueled by the regulatory incentives and technical advancements, consumer adoption is still a hardship to reach the destination of achieving the goal of selling the EV among the buyers. In addition to providing the insights for stakeholders seeking to promote green transportation and to meet global climate targets, this systematic review attempts to summarize the body of research on consumer behavior related to EV adoption in India.

Figure 1 highlights the importance of this systematic analysis on the adoption of EVs in the automobile sector which depicts an exponential increase in the scholarly publications from the year 2015 to June 2025. According to the academic community, the numbers demonstrate how crucial the EV adoption is for promoting sustainable behaviours in the current environment. It also demonstrates the growing significance of EVs for business and policymaking in the competitive automobile industry.

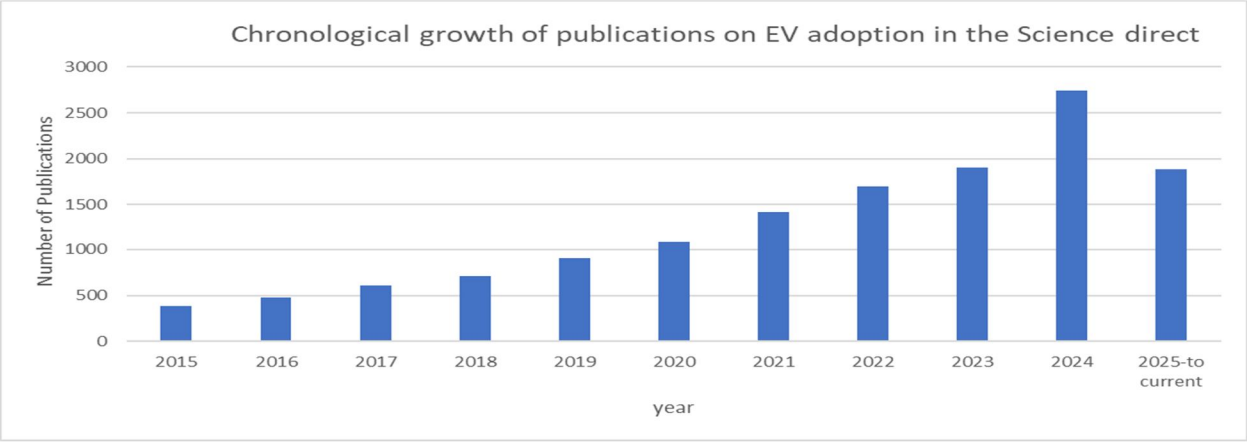

Figure 1. Chronological growth of publications on EV adoption based on consumer behaviour keyword and its multifaceted impacts (2015— June 2025)—Science direct.

EVs are expected to account for 30% of private automobile sales , 70& of commercial vehicle sales, 40% of bus sales, and 80% of two and three wheeler sales by 2030 , according to the Indian Brand Equity Foundation. The lofty target of 80 million EVs on Indian roads by 2030 has been set. India's 'make in India' initiative also seeks to create all EVs in the country.

A. RQ1:What patterns and trends have surfaced in the scholarly literature on the market and automotive sector's adoption of electric vehicles between 2010 and 2025?

The systematic analyze and synthesize scholarly contributions from 2015 to 2025, highlighting:Trends in publication volume and geographical focusShifts in research themes (e.g., consumer behavior, technological innovation, infrastructure, policy, environmental concerns)Adoption models/theories used (e.g., Theory of Planned Behavior(TPB),Technology acceptance Model(TAM),Diffusion of Innovation) Methodologies are employed (quantitative, qualitative, mixed-methods).Evolving challenges and future directions for EV adoption research. Over the past 10 years, theoretical frameworks in EV adoption research have undergone a marked evolution over the years. Initially the field of research is dominated by innovation-centric models like the Diffusion of Innovation Theory and the Technology Acceptance Model (TAM), the field gradually embraced psychological models such as the Theory of Planned Behavior (TPB) and UTAUT to better understand the consumer attitudes toward Ev and intentions in the buying behaviour in the automotive industry of Ev. From 2018 onwards, the literature reflects a shift towards more holistic, integrated frameworks that account for infrastructure, policy in India, and behavioral economics towards the Ev . Recent studies inclination towards multi-theoretical or data-driven approaches, indicates a research that acknowledges the complexity of EV adoption both as a technological and societal transition in the EV market.. Surveys remain the dominant method, particularly when grounded in behavioral frameworks such as the Theory of Planned Behavior or UTAUT. Statistical and econometric models are widely used to quantify relationships between variables like cost, range anxiety, infrastructure, policy incentives and technological innovations. Case studies and direct interviews provide rich contextual insights, especially in policy and local regional analyses. In recent research , the field has embraced simulation methods like agent-based modeling and system dynamics to explore systematic dynamic adoption patterns and forecast policy impacts. The methodological landscape has become increasingly diverse and sophisticated, reflecting the complexity of EV adoption as a socio-technical phenomenon among the customer in the EV market.

B. RQ2: What are the key factors influencing electric vehicle adoption across different regions and demographic groups?

EV adoption is influenced by factors cost , technological innovations, demographic, behavioral, and policy made in the country. While affordability and infrastructure remain universal concerns, the weight of these factors varies across regions and groups when it comes to the EV market. In developed countries, environmental awareness, social influence, and strong policy incentives play a major role. In contrast, emerging economies emphasize cost, access to public chargers, and availability of affordable models. Demographically, young and educated urban consumers with high income people are more likely to adopt EVs. Psychological and behavioral factors have been vital for understanding EV adoption in the market .Early models define economic rationality, more recent studies integrate behavioral theories such as TPB and VBN to capture the influence of values, norms, and perceptions towards EV. Positive attitudes toward environmental wellness , combined with societal intention and a sense of behavioral control improves the EV adoption in the country. However, certain hurdles such as range anxiety and habitual reliance on conventional ICE vehicles continue to inhibit behavior change, especially in regions where the infrastructure is still a question. A growing body of research also highlights the linear growth of technology readiness and perceived innovation appeal, particularly among younger and tech-savvy consumers increased EV adoption.

A. Attitudes and Perceptions

Consumer buying attitudes over EVs includes environmental wellness, and technological innovation and social influence plays a significant role .From the studies using Theory of Planned Behavior (TPB) in the (Ajzen, 1991) emphasizes that "the positive attitudes toward environmental protection and innovation significantly enhance the intention to adopt EVs". Perceptions of performance, maintenance requirements, and brand trust also contribute to adoption likelihood.

Research indicates a strong correlation between pro-environmental values and EV adoption. Consumers who identify as environmentally conscious are more likely to adopt EVs, particularly in markets where climate change awareness is high. The Value-Belief-Norm(VBN) Theory (Stern, 2000) frequently used to showcase how environmental values translate into personal norms that support sustainable behaviors like EV adoption.

B. Social Influence

Adoption may be influenced by descriptive norms and social influence (ex.,"majority of my coworkers in my office dive Es"). subjective norms and the person's impression of how other people perceive their behaviour can be strong motivators, claim TPB. In certain situations, EVs are also viewed as status symbols or indicators of contemporary and responsible citizenship behavior.

The concerns over the battery life span of the car, range anxiety, and charging infrastructure availability often hinders the adoption of EV , even among those with positive attitudes. Literature over the papers focuses that the risk aversion leads some consumers to delay adoption until EVs are seen as "mainstream" or "proven."

Driving habits are also one of the key aspects when it comes to adoption of EV. Most people have a daily routine of driving an IC engine which is also a barrier to adoption. Individuals accustomed to internal combustion engine (ICE) vehicles may hesitate to switch due to habit inertia or the cognitive burden of adopting new behaviors (e.g., charging routines).

People with a high amount of innovativeness or high scores on the Technology Readiness Index (TRI) are more likely to be adopters of EVs. Literature suggests early adopters are more influenced by curiosity, innovation and novelty than by regular vehicles.

C. RQ3: What psychological, social, and economic factors influence consumer decision-making regarding electric vehicle adoption?

Consumer buying behaviour regarding EV adoption is framed by psychological, social, demographic and economic factors. In context to Psychological, attitudes toward technology, environmental wellness , and social influence.

Both internal attitudes and the behaviour model's perceived control are important in behavioural models such as the theory of Planned behaviour. Culture and community preference influences the adoption of EV in the mindset of the buyers. In context to Economic factors such as purchase price, service running cost, and government incentives and policies affect the perceived value proposition of EVs. Moreover, high-income customers prefer to adopt a new lifestyle and maintain the status, and lower-income customers are often vulnerable to upfront cost and charging infrastructure availability. These factors showcase the variability in EV adoption with respect to regions and demographic groups.

1) Psychological Factors

Psychological determinants such as buying behaviour , attitude , personal buying experience, and risk taking factors shape consumer buying decisions in the EV adoption. In order to forecast behavioural intentions , the Theory of planned behaviour(TPB) which has been applied to the adoption of EVs, places a strong emphasis on attitudes towards purchasing behaviour, subjective value, and behavioural control which is discussed in the research paper by "Ajzen,1991". Positive attitude toward environmental wellness and the benefits of EVs such as low emissions and technological appeal improves the adoption intent (Rezvani et al., 2015).

Perceived behavioral control (PBC) defines that the consumers tend to adopt EVs when they find access to the charging station is quite easy and can maintain the running cost (Zhang et al., 2021). Risk perception focuses on range anxiety, battery lifespan, and resale value creates a negative influence on EV adoption . Moreover, innovativeness and technology readiness have been shown to drive early adoption, particularly among younger and tech-savvy consumers (Javid & Nejat, 2017).

2) Social Factors

Social influence is a critical factor in the buying behaviour process. Consumers are more likely to adopt EVs when they perceive that peers or the society endorse such behavior (Liu et al., 2019). The symbolic value of EVs as status symbols—associated with environmental responsibility and modern identity can also enhance their appeal (Axsen & Kurani, 2013).

Observational learning improves the visibility of EVs in public communities and social acceptance grows which reinforces normative behavior (Hardman et al., 2016). In many studies, social identity and peer behavior are found to improve the adoption intentions, particularly in high-density urban settings.

3) Economic Factors

The financial factor is considered as one of the key aspects for EV adoption . Although EVs quote low operational cost the upfront costs remain quite high which acts as a barrier, especially in low and middle income consumers' market space . Research shows the (TCO) including fuel, maintenance cost and insurance cost often outweighs the buying cost in consumer calculated net amount.

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Government incentives such as subsidies, tax rebates, and low registration fees have proven to be an accelerating adoption of EV, especially in European countries. Additionally, gradual increase in the fuel price and widening finance options increases the cost benefits for the potential buyers.

Income level is considered to be one of the key aspects for the potential buyers. Most of the high-income people are prone to adopt EV whereas the low-income people are price sensitive and not ready to adopt and take risk.

II. METHODOLOGY

Methodology outlines the idea of the research papers through databases such as Scopus, science direct , web of science . The screening process of the titles and abstract and the assessment of the article eligibility and final study inclusion and exclusion criteria has been studied.

a)Literature Retrieval: In the systematic review we have conducted a comprehensive search in the Scopus database using a specific set of keywords to identify publications relevant to EV adoption. The search strategy was structured to cover up the literature on EV adoption in India comprehensively, using a targeted query in the Scopus, science direct and Ieee explorer database. Our search string was: (“electric vehicle*” OR “EV” OR “EVs”) AND (“Emission Reductions” OR “Adoption of EVs”) AND (“sustainability” OR “Key Performance Indicators” OR OR “energy consumption” OR “cost savings” OR “renewable energy utilization” OR “consumer buying behaviour”).

The keywords are carefully chosen to encompass the many facets of research on EV adoption . While phrases like “fleet electrification”, “management”, and “operations” focus on organisational effects, “electric vehicle” and its variations define the scope in a more general sense. The “emission reductions” and "sustainability" capture environmental repercussions, “organisational performance”, “KPI” , and related terms concentrate on the technological and performance -related elements necessary to comprehend the wider ramifications of EV adoption. Scopus covers a wide range of study domains including business , environmental science and engineering, we decided to use it as our main database of over 753 publications were retrieved as a result of this method demonstrates the current trends and significant interest in the nuanced effects of EV adoption in the market.

A. PRISMA flow diagram

The PRISMA flow diagram (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) is a standard tool commonly used to visually summarize the article screening and selection of the literature with the systematic literature review (SLR). It helps to portrait transparency, reproduce ,and rigor in how sources were identified, screened, and included in the review.A typical PRISMA diagram has four phases:

1) Identification

Total records identified through database searching (e.g., Scopus, Web of Science, IEEE Xplore).Additional records identified through manual search or other sources (e.g., reference lists, Google Scholar).This is where all potential records are first collected—through database searches, registries, manual screening of reference lists, or other methods. The total number of sources located (and duplicates removed) is clearly recorded.

2) Screening

Screening helps to remove the duplicates of the phrases in the research paper. Remaining records screened based on titles and abstracts.Once duplicates are removed, the remaining titles and abstracts are assessed briefly to exclude obviously irrelevant studies—those not related to the research question or not meeting basic criteria.

3) Eligibility

Full-text articles assessed for eligibility. Articles excluded with reasons (e.g., not relevant, not peer-reviewed, insufficient data).The main goal is to assess the full-text articles for inclusion.The process of the model involves the retrieval of full text review of remaining articles and studies in the research paper. It also helps to apply the full criteria of the article.

4) Inclusion

Final number of studies included in the review (qualitative, quantitative, or both). It involves the finalisation of studies for synthesis. The process involves the final set of studies that is involved in the qualitative synthesis of the research work.

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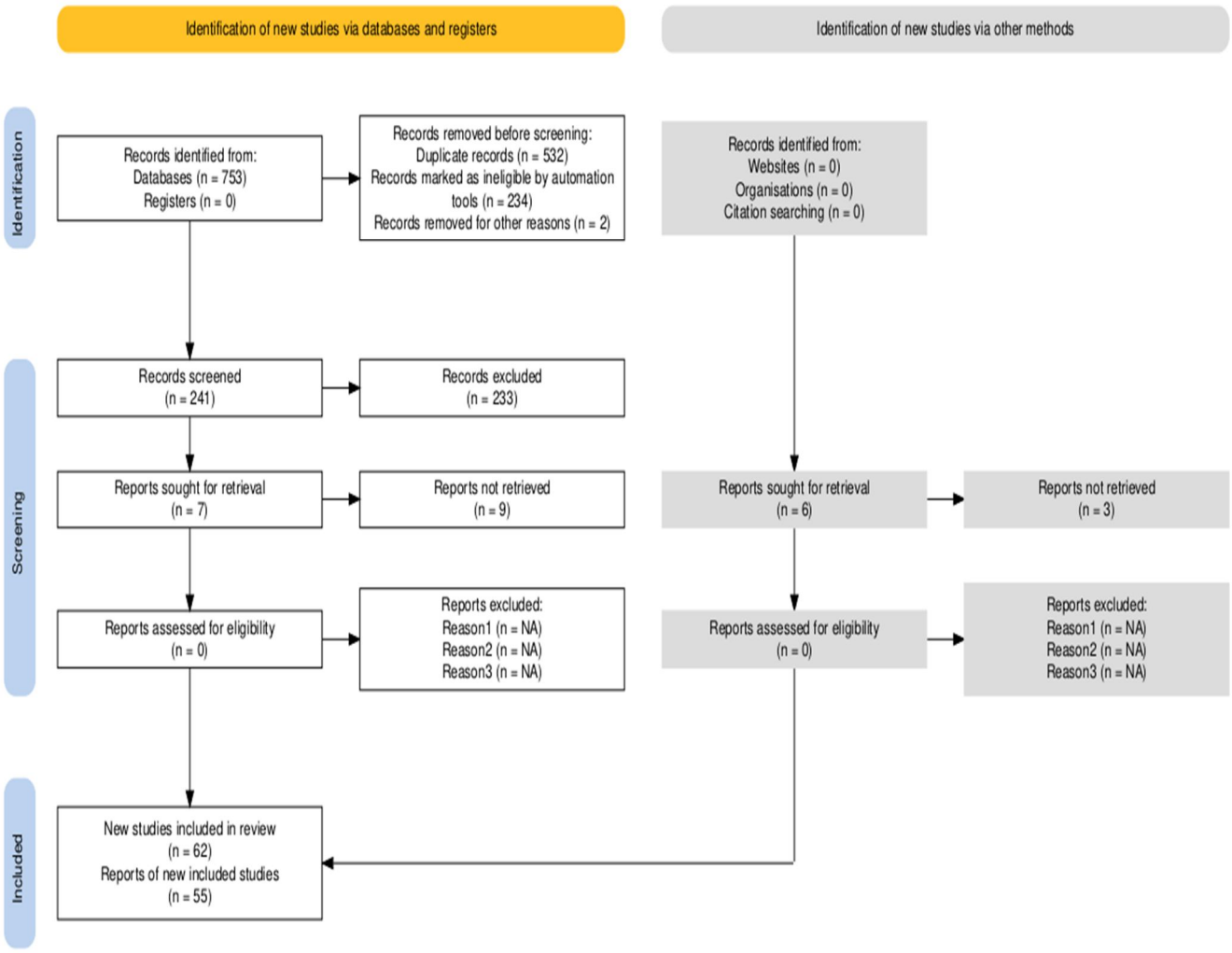

Figure : PRISMA flow diagram.

A. Selection Process

Selection process is done by screening two independent reviewers for the titles of the research paper and abstract of the studied articles with the help of Excel spreadsheets software, distinguishing each review as 'relevant' or 'not relevant' by specifying colour codes such as green indicates relevant, red indicates not relevant). Discrepancies were resolved through consensus in the joint review sessions, with the condition of no disagreement . This type of screening without the use of automated tools, the rigor and improved reproducibility of the selection methodology, with the PRISMA 2020 guidelines.

1) Methods Used in the studied Articles

The section briefs the reviewed articles with perspective of the research approach and analytical techniques used to show the relationship between EVs adaptation and consumer buying behaviour. The paper demonstrates the data collection methods and the analytical methods used in consumer attitude in terms of adoption of EV related studies. Surveys are by the most utilized quantitative method. Other used methods are direct interviews and conceptual analysis related to the research work. In context to the data analysis technique, structural equation modelling(SEM) is considered as the analyzed studies, accounting for 23% of the total studies, followed by confirmatory factor analysis, accounting for 16% of the total studies that have been reviewed. It is to be noted that 14% of the total studies adopted a combination of regression analysis and stated preference experiment and discreet choice modeling, or time-series analysis along with census-tract-level demographic data.

	Methods	No. of Studies
Quantitative	Chi-square, integrated choice and latent variable model, factor analysis, Mann–Whitney equality of medians test, game theory, stochastic dynamics bi-level model, multi-criteria decision analysis, SEM, Decision-Making Trial and Evaluation Laboratory (DEMATEL) approach, choice-based conjoint analysis, t-test, stated preference choice experiment, regression, correlation, mixed logit model, latent class model.	44
Qualitative	content analysis, in-depth interview, thematic analysis, comparative analysis	6
Mixed Method	regression and secondary data scanning, e-mobiliTI app, stated preference experiment and discrete choice modelling, census-tract-level demographic data and time-series analysis, regression and cross-checking with local demographic data, content analysis with regression	7

2) Data Collection Process

Data extracted from the study were independently extracted by two reviewers with the help of structured Excel spreadsheets which are designed to store the essential information, such as the year of publication, main focused area, key findings, and the objectives of the study. This type of approach improved the consistency and comprehensiveness. The reviewers worked to minimize bias independently , and planned to resolve discrepancies through surveys with this significant discrepancies having been reduced. If any sort of disagreement happens it has to be resolved through the communication with the second author, who also acts as the advisor for providing the final guidance. This type of manual process enhances the accuracy and reliability of the data, and reaches the transparency standards set by the PRISMA guidelines.

3) Data Extraction and Analysis

Data collection is extracted for the four primary outcomes to assess the comprehensive impacts of EV adoption behavior : Consumer behaviour attitude, organizations, technology, and government policy. In the context of Environment Focus on GHG emissions, air quality and lifecycle impacts. Consumer: Price, fuel, and market demand impact by EV adoption. Technology: Analysis of updates in battery technology , energy efficiency, and quick charging ability. Assessment of government policy , regulation impacts, and recommendations to create awareness for the EV adoption among the customers.

III. THEORETICAL FRAMEWORKS

Behavioural theories added in the theoretical frameworks are included in the reviewed literature papers:

- Theory of Planned Behaviour (TPB)
- Technology Acceptance Model (TAM)
- Diffusion of Innovation (DOI)
- Unified Theory of Acceptance and Use of Technology (UTAUT)
- Value-Belief-Norm Theory (VBN)

A. Theory of Planned behaviour (TPB)

A psychological theory that links ideas with the behavior is known as the theory of planned behavior. According to the theory, a person's behavioral intentions are shaped by their attitude, subjective norms, and perceived behavioral control. According to TPB, which was developed by Ajzen (1991), the following factors affect behavioral intention, the best indicator of actual behavior:
Attitude: An individual's decision making factor (is purchasing an EV worth buying or not?)
Subjective Norms: Perceived with the society where people of our community tend to shift to the culture of owning the vehicle . Akin to the self-efficacy, the perceived behavioral control (PBC) showcases how easy or difficult an activity has been done.

B. Technology Acceptance Model (TAM)

The information systems theory that shows how people accept the upcoming technology and uses the technology is called the technology acceptance model. At the end where the humans get used to the technology as the actual day to day system as part of life and work. The factor that motivates the humans to use the technology makes a huge impact to rely on the assistive technology.

C. Diffusion of Innovation (DOI)

The theory of diffusion of innovation figures how new concepts and innovations drastically get involved with a population. It showcases how the method where the people or organization gradually embrace the invention and supports innovation. According to the theory, adopters are segmented into groups according to their willingness to proceed with new ideas of innovators, early adopters, early majority late majority, and laggards. The Diffusion of Innovation (DOI) theory, proposed by Everett Rogers (2003), has been widely applied in electric vehicle (EV) adoption literature to explain how new technology incorporated with a society over a short period of time. Based on consumer readiness and risk tolerance the technology is getting matured enough to meet the demand. It also highlights key innovation attitudes that impact EV adoption: relative advantage, compatibility, complexity and observability.

1) Application of DOI in EV Adoption

In EV research, DOI theory is commonly used to:

- Segment consumers based on their perspective to adopt (e.g., early adopters vs. mainstream users).
- Identify communication channels and influencers (e.g., government, media, peers).
- Analyze how social systems and market maturity affect adoption timing and acceptance.

For instance, Egbue and Long (2012) applied DOI to study consumer concerns and identified that the perceived complexity of charging and limited observability (seeing others use EVs) delayed adoption. Similarly, Axsen, Mountain, and Jaccard (2009) showed that early adopters of plug-in hybrid vehicles (PHEVs) placed high value on innovation, environmental benefits, and social signaling.

2) Innovation Attributes and EV Adoption

- Relative Advantage: Customers are likely to adopt EVs when they use the clear benefits over internal combustion engine (ICE) vehicles—such as lower fuel costs, environmental impact, and policy tax incentives (Sierzchula et al., 2014).
- Compatibility: Adoption is higher when EVs align with users daily routines, values, and existing infrastructure (Li et al., 2017). In urban areas with shorter commutes and better charging access, EVs are more compatible.
- Complexity: Technologies that are perceived as difficult to understand or operate—like home charging or range estimation—can hinder diffusion (Rezvani et al., 2015).
- Trialability: The ability to test or experience EVs (e.g., through rentals, ride-sharing, or test drives) positively influences adoption intent (Lane & Potter, 2007).
- Observability: Seeing EVs in use by peers or in public fleets increases consumer confidence and accelerates diffusion (Axsen & Kurani, 2013).

3) Limitations and Evolution of DOI Use in EV Research

While DOI provides a foundation for knowing the innovation, some of the researchers state that it simplifies complicated market transformation. For instance, it is often clear that linear progression through adoption may not reflect real-world dynamics shaped by policy, infrastructure, and environmental attitudes (Rogers, 2003; Sovacool & Hirsh, 2009).

In response, recent studies combined with the DOI aligned to behavioral models like the Theory of Planned Behavior (TPB) and Technology Acceptance Model (TAM) to account for psychological and contextual frames.

The DOI theory highlights the analyzing EV adoption method, particularly in the adopter segments and portraying how innovation shapes the EV adoption behavior. Attributes such as relative advantage, trialability, and observability have been repeatedly confirmed as influential in EV adoption. However, due to the complexity of the EV ecosystem—including infrastructure dependency, government policy incentives, and customer risk perceptions—researchers increasingly add DOI with high behaviorally grounded models. Nonetheless, DOI remains a foundational framework in EV adoption research literature, especially for market segmentation and framing the strategies to improve the early adoption.

- Value-Belief-Norm Theory

The Value-Belief-Norm (VBN) theory states how personal values, beliefs, and individual norms impact future environmental behavior. VBN shows that when people's personal behaviour which are impacted by their values and beliefs on environmental concerns are involved, they are more likely to take suitable activities.

- Unified Theory of Acceptance and Use of Technology (UTAUT)

The theory concept that states how people come to accept and get used to the upcoming technology is generally defined as the Unified Theory of Acceptance and Use of Technology (UTAUT). UTAUT, which was created by Venkatesh et al. in 2003, clarifies the concept of how the technology adoption variables get affected by mixing the main concepts from over eight varying innovation technology acceptance models.

4) Key Themes in Consumer buying Behaviour

Psychological Factors

Environmental concern, behavioural control, and personal innovativeness significantly affect EV adoption intentions over the consumers. Psychological factors play a vital role in shaping consumer buying behavior, induces how a customer makes a decision of buying the products and improves the selection mode. These factors arrive from an individual mental state and are linked with personal preferences , life experiences, and ability to adopt the trend method among buyers. Motivation refers to the internal drive or desire that stimulates a person to satisfy a need or achieve a goal (Schiffman & Kanuk, 2007). Application: Consumers tended to functional needs (e.g. affordable cost, reliability), emotional requirements (e.g., looks of the product, status), and social concerns (e.g., environment quality).

Example: In the EVs purchase context , eco-friendly consumers are motivated by the goal to reduce carbon emissions in the environment.

Perception

Definition: Kate Zabriskie (ImarkGuru) highlighted how consumers perceive the brand becomes their reality.

Application: Product delivering , branding, marketing, and online reviews influence how consumers value and quality. For example, a consumer may view an EV as unreliable if the consumer believes that charging difficulties or battery issues exist regardless of actual performance data.

Learning refers to the process by which a person tends to change their behavior based on their experiences. The learning process can be stated as conditioning, instrumental conditioning, or cognitive learning. For example, the consumer who test-drives an electric car and finds it enjoyable may learn to love the EVs with comfort and innovation.

Beliefs and Attitudes

Beliefs are assumptions about a product; attitudes are a person’s consistent evaluations or feelings about it (Solomon et al., 2015). Favorable attitudes based on positive beliefs often lead to purchase intentions . For example: A consumer who believes that EVs are cost-effective and environmentally responsible is likely to develop a positive attitude toward their adoption.

Personality and Self-Concept

Personality refers to the lifestyle of the user. In most of the cases the personality is considered as the important factor for the consumer to opt for the product. Most consumers believe that the person's identity and their personality is mostly shown and seen with the product they use. The EV adopters are most likely to be tech savvy and feel them as the innovative followers for the upcoming technology vehicle.

Psychological factors create the base for the consumer decision-making processes by making for customers recognize needs, evaluate alternatives, and create preferences. Motivation initializes the buying process among the consumers, while perception increases the consumer’s awareness to the newly launched product information. Through learning and experience, consumers update their beliefs and attitudes, shaping long-term brand preferences.

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Personality and self-concept further direct purchases toward products that align with a consumer's identity or aspirations. These psychological components are particularly influential in high-involvement purchases such as electric vehicles, where both rational and emotional considerations drive adoption behavior (Kotler & Keller, 2016; Solomon et al., 2015).

D. Social Influence

Social influence is generally considered as the key aspect of the electric vehicle adoption in the current generation. Peer pressure and self reliance leads to the adoption of electric vehicles buying behaviour of the consumer.

In context to the Theory of Planned Behavior (TPB), most of the consumers are prone to buy or consider the purchase of the electric vehicle with the expectation of the consumer's relationship with the family members and getting into the tech world for most of the upcoming technological adoption.

1) Observability and Visibility of EV Use

Observability is one of the key factors when it comes to the adoption of EV among the consumers. Consumers who are opting for the change in the field of automotive would like to purchase their vehicle by observing the vehicle on the road. It also influences the consumer to have the first time of buying the car. The observation and visibility of Electric vehicles is mostly discussed in many of the research papers with the references to the Diffusion of Innovation(DOI)Theory to justify the concept of consumer behaviour.

2) Social Identity and Symbolic Value

EVs among the consumer are not only considered as the functionality but seen as a status symbol competitive to their peer people. Since it is a quite large investment in the family it is proven to be the symbolic value. In context to the EV adoption the consumer is more considered as a tech-savvy and futuristic thoughtful personality and considers them as a symbolic value and technology progressive personality for the buying behaviour in the market. The research paper of Rezvani et al. (2015) shows the symbolic attributes of "innovator image" and "prestige" for the purchasing behaviour in the EV.

3) Community Norms and Localized Diffusion

Most of the studies show that the EV adoption is also connected to the community norms such as peer people buying behavior and people around the area buying and using the product which directly or indirectly influences the buying behaviour of the consumer. In context to the EV adoption the localized diffusion also influences the buyer to make a decision of buying the product which is also included in the research papers related to the community norms and localized diffusion.

Influencers and Opinion Leaders

Influencers and opinion leaders are also considered as one of the key factors influencing the adoption of EV among the consumers. Popular celebrities and social media influencers' opinions are mostly considered as the trusted word for buying the product. Influencers cover the mass audiences and it influences the wider audiences.

Social influence is one of the most important factors when it comes to the adoption of EV. People in this generation are prone to adapt to new technology based on the trend influenced by the social influencer. The neighborly events conducted by the somewhat popular influencers are also prone to influence the buying behaviour of the consumer. There are many influencers like Automotive youtubers, Tech reviewers , celebrities could greatly influence the adoption of Electric vehicles among the users.

E. Economic Considerations

Economic factors are considered as one of the key factors when it comes to electric vehicle adoption. The factors such as consumer behaviour, government policy and manufacturing strategy.

1) Purchase Price and Affordability

The initial purchase cost of EVs continues to be a primary barrier, especially in emerging markets and among middle- to low-income consumers. While EV prices have declined over the past decade due to advancements in battery technology and economies of scale, they often remain higher than comparable ICE vehicles (Sierzchula et al., 2014; Li et al., 2017). This price gap can deter cost-sensitive buyers, particularly when access to credit or financing is limited (Caperello & Kurani, 2012).

2) Total Cost of Ownership (TCO)

Beyond purchase price, many consumers consider the total cost of ownership (TCO), which includes fuel costs, maintenance, insurance, and resale value.

EVs generally offer lower fuel and maintenance costs due to fewer moving parts and high energy efficiency. Studies show that when consumers are made aware of TCO advantages, their adoption intent increases (Gnann et al., 2015; Rezvani et al., 2015). However, information gaps or myopic decision-making may lead some consumers to overemphasize upfront cost rather than long-term savings.

3) Government Incentives and Policy Support

Public policies play a central role in offsetting economic barriers to EV adoption. Financial incentives such as vehicle subsidies, purchase rebates, tax exemptions, low registration fees, and free parking have been implemented across multiple countries to boost adoption (Wang et al., 2020; Li et al., 2017). For example, Norway's extensive incentive system has been widely credited with the country's world-leading EV market share (Figenbaum, 2017). However, evidence also suggests that the effectiveness of incentives depends on their clarity, consistency, and duration (Hardman et al., 2016).

4) Fuel and Energy Prices

Fluctuating fuel prices influence the relative cost-benefit of EVs. As fuel prices rise, the economic appeal of EVs increases, particularly for high-mileage users (Sovacool et al., 2018). In contrast, regions with subsidized fossil fuels or low electricity prices may see slower EV diffusion unless policy interventions adjust the cost environment (She et al., 2017).

5) Charging Infrastructure and Time Costs

While not a direct economic expense, the opportunity cost of charging time and limited access to public charging infrastructure can increase the perceived "cost" of owning an EV. Investments in fast-charging networks reduce these perceived costs and thus improve economic feasibility (Li et al., 2019).

6) Income and Socioeconomic Status

Household income significantly influences EV adoption. Higher-income consumers are more likely to purchase EVs due to greater affordability and access to credit, while lower-income segments face economic constraints even when incentives are present (Javid & Nejat, 2017; Caperello & Kurani, 2012). Additionally, income affects sensitivity to fuel prices and interest in long-term cost savings. Economic considerations are foundational to electric vehicle adoption decisions, with purchase cost and total cost of ownership (TCO) emerging as the most influential financial metrics. While EVs may offer long-term cost savings, higher upfront prices and information asymmetries often deter consumers. Government incentives, including subsidies and tax rebates, help reduce this cost burden and have been linked to significant adoption surges in countries with strong policy frameworks. However, adoption remains highly income-dependent, highlighting the need for targeted interventions that address affordability and financing access for underrepresented consumer segments. As battery prices decline and public infrastructure expands, the economic case for EVs is expected to improve across a wider range of markets.

F. Technological Attributes

Technical attributes would help to shape the consumer decision of buying the ev over the ICE. Most of the important attributes such as range and charging infrastructure were discussed in the literature studies. Consumer adoption is linked to technical and performance-related attributes which is discussed in the Rezvani et al. (2015).

1) Driving Range and Battery Performance

Driving Range is considered as one of the barriers for the adoption of EV among the consumer. Most consumers face range anxiety when the consumer has an idea of buying the vehicle. This kind of hurdle limits the potential buyers to choose the electric vehicle which is discussed in the Rezvani et al. (2015) and Egbue & Long (2012) studies.

Improved technology with the extended range for the single charge will influence the consumer to buy the electric vehicle over the ICE vehicle. With the improved battery performance and faster charging creates a good impression towards the ev. Consumer tends to buy the ev once the manufacturing company offers the longer battery warranties for the model they have chosen. This is discussed in most of the studies related to the ev adoption.

2) Vehicle Performance and Driving Experience

Many of the consumers feel the EV is more smooth and reliable to drive the car when compared to the ICE vehicle. The acceleration and the drive handling is more comfortable even for the basic car when it is compared to the ICE vehicle. The EV has instant torque and it is fun to drive in the city . This type of feature influences the positive impact over the adoption of ev among the people. The

EV is more prone to improved performance with the minimal number of moving parts which is considered to be an enhanced feature for the EV adoption.

G. Software and Connectivity Features

In the upcoming competition in the automotive industry modern EVs includes smart technologies such as:

- Mobile applications to control and monitor the performance of the vehicle,
- In-built navigation system with charging station location maps,
- Over-the-air (OTA) software updates,
- Autonomous driving features (in higher-end models).

These types of value-added technologies improve the user experience and convenience and contribute to differentiation from Internal combustion engine vehicles which is published in the Axsen et al., 2015 paper . However, some consumers are still concerned about data privacy, and system reliability in the vehicle they purchase.

H. Trust and Information

Trust in technology, government policy, and the reliability of information sources directly affects the decision-making among consumers . The buying behaviour of electric vehicles (EVs) does not depend on the function of technological capability or economic feasibility alone; it also depends on consumer trust and the quality, and availability of information. These factors influence how consumers have an idea of new technologies, manage perceived risks, and form of decision making. In the context of Ev , trust operates across multiple domains—trust in technology, trust in manufacturers, and trust in policy and infrastructure—while information affects knowledge levels, awareness, and attitudes. Trust underlying the battery management technology, drive range, and charging system is fundamental to EV adoption. Uncertainties about battery lifecycle, performance reduction , and vehicle reliability are commonly cited barriers (Egbue & Long, 2012; Rezvani et al., 2015). When consumers trust in the technology's long-term durability reduces , they may tend to procrastinate or reject the adoption of EV despite many government policy incentives or environmental concerns.

IV. METHODOLOGICAL TRENDS

Most of the studies in the literature review use qualitative methods, especially surveys and structural equation modeling. Qualitative and mixed-method approaches are underutilized. Research is concentrated in developed countries, with limited studies in emerging markets. Quantitative Surveys and Statistical Modeling, Behavioral and Psychological Frameworks, Qualitative and Mixed Method, Policy and Scenario Analysis, GIS and Spatial Analysis. Behavioral modeling is increasing, particularly with combined TPB-TAM frameworks. The TPB-TAM integrated framework in the research review combines two widely used models in technology and innovation adoption research as TPB(Theory of planned behaviour) and the Technology Acceptance Model (TAM). Mixed methods are gaining popularity to bridge the gap between quantitative patterns and contextual understanding. Scenario and policy evaluation methods are essential for national-level planning. There's a rising trend of region-specific studies, reflecting the diversity in Indian states' EV readiness.

V. FUTURE SCOPE OF RESEARCH

This research paper is a work of review of research papers related to the adoption of EVs in which it is studied that there are certain limitations in the scope of research. Certain conference papers and the papers were eliminated as methods of dissection work. There might be some papers that might have been neglected which may be the papers that are out of the language (language). Secondly the electric vehicle is mostly not adopted by the Indian consumers and hence foreforth the data is not worked as for the methodological work. Third, there is no prescribed conceptual framework for the concept for the adoption of electric vehicle adoption related and henceforth the primary data is rarely available and most of the data is retrieved as a secondary paper in most of the research papers.Thus the electric vehicle adoption in the Market has a large scope to deal with the focus on consumer behaviour.

VI. CONCLUSION

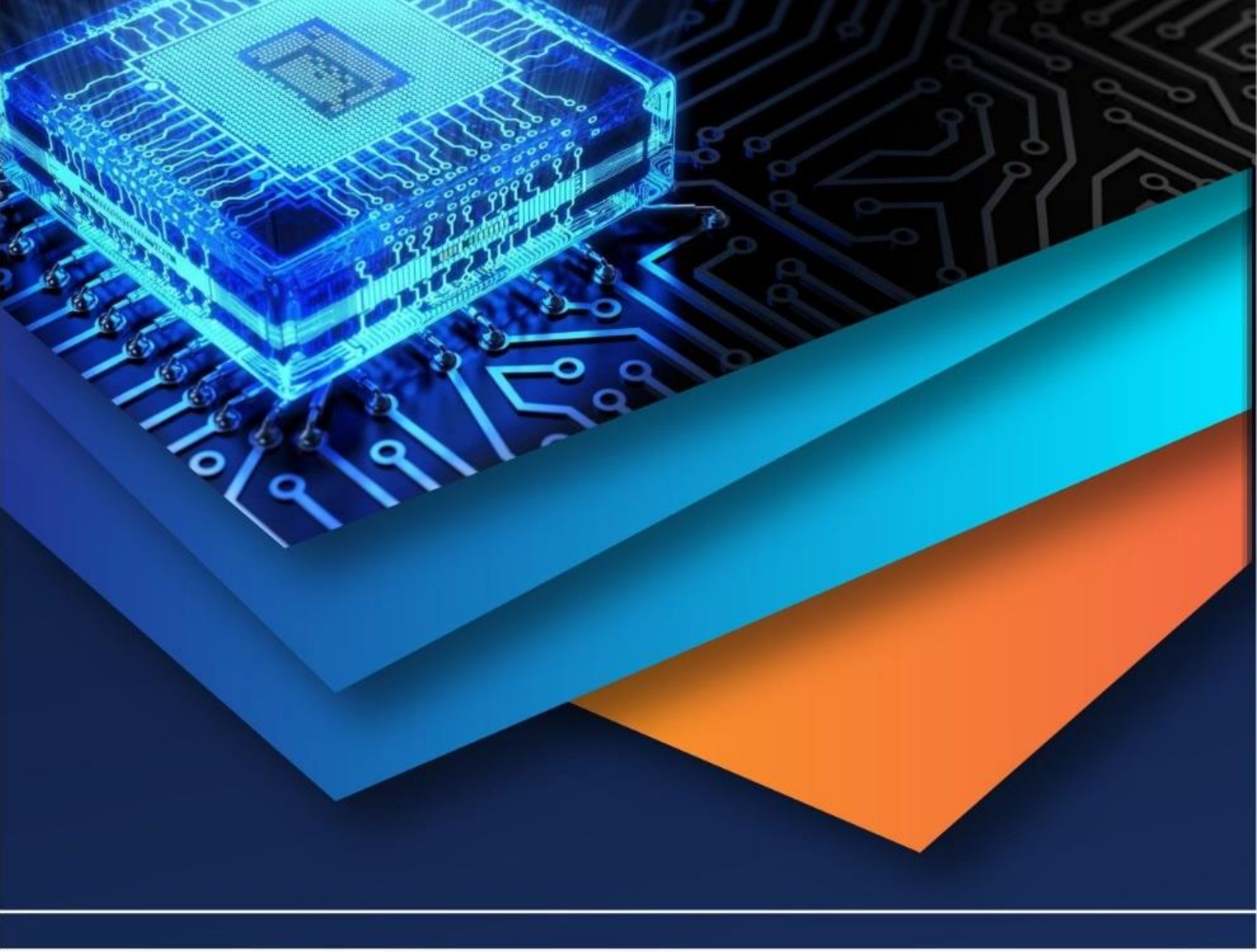
The transition to Electric vehicle adoption involves various aspects especially when it comes to understanding the consumer buying behaviour. Consumer behaviour is a multifaceted determinant in the adoption of EVs in India. Understanding the different behavior with the comprehensive understanding requires integrating a mix of psychological, social, economic,policy and infrastructural factors. Future research should broaden methodological approaches and include more diverse populations to inform global EV strategies.

The systematic literature review would improve the quality of the further research on the buying behaviour of the consumer towards the adoption of electric vehicles. These factors would improve the strategic planning of the manufacturers and the stakeholders to invest in the company.

REFERENCES

[1] Peng, B.; Du, H.; Ma, S.; Fan, Y.; Broadstock, D.C. Urban passenger transport energy saving and emission reduction potential: A case study for Tianjin, China. Energy Convers. Manag. 2015, 102, 4–16.
[2] Qian, L.; Yin, J. Linking Chinese cultural values and the adoption of electric vehicles: The mediating role of ethical evaluation. Transp. Res. Part D Transp. Environ. 2017, 56, 175–188.
[3] Junquera, B.; Moreno, B.; Álvarez, R. Analyzing consumer attitudes towards electric vehicle purchasing intentions in Spain: Technological limitations and vehicle confidence. Technol. Forecast. Soc. Chang. 2016, 109, 6–14.
[4] Carley, S.; Krause, R.M.; Lane, B.W.; Graham, J.D. Intent to purchase a plug-in electric vehicle: A survey of early impressions in large US cites. Transp. Res. Part D Transp. Environ. 2013, 18, 39–45.
[5] Steinhilber, S.; Wells, P.; Thankappan, S. Socio-technical inertia: Understanding the barriers to electric vehicles. Energy Policy 2013, 60, 531–539.
[6] Hidrue, M.K.; Parsons, G.R.; Kempton, W.; Gardner, M.P. Willingness to pay for electric vehicles and their attributes. Resour. Energy Econ. 2011, 33, 686–70
[7] He, Z., Zhou, Y., Wang, J., Shen, W., Li, W., & Lu, W. (2023). Influence of emotion on purchase intention of electric vehicles: a comparative study of consumers with different income levels. Current Psychology, 42(25), 21704-21719.
[8] Schneidereit, T.; Franke, T.; Günther, M.; Krems, J.F. Does range matter? Exploring perceptions of electric vehicles with and without a range extender among potential early adopters in Germany. Energy Res. Soc. Sci. 2015, 8, 198–206.
[9] Liao, F.; Molin, E.; van Wee, B. Consumer preferences for electric vehicles: A literature review. Transp. Rev. 2017, 37, 252–275.
[10] Senn-Kalb, L.; Mehta, D. eMobility—In-Depth Market Insights & Data Analysis; Statista: New York, NY, USA, 2022; Available online: Mordor Intelligence. (July 25, 2022). Size of the Global Market for Electric Vehicles in 2021 and 2027 (in Billion U.S. Dollars). In Statista. Available online:
[11] Donthu, N.; Kumar, S.; Mukherjee, D.; Pandey, N.; Lim, W.M. How to conduct a bibliometric analysis: An overview and guidelines. J. Bus. Res. 2021, 133, 285–296.
[12] Small, H. Visualizing science by citation mapping. J. Am. Soc. Inf. Sci. 1999, 50, 799–813.
[13] Popay, J.; Roberts, H.M.; Sowden, A.J.; Petticrew, M.; Arai, L.; Rodgers, M.; Britten, N. Guidance on the conduct of narrative synthesis in systematic Reviews. A Prod. ESRC Methods Programme Version 1 2006, 1, b92.
[14] Lucas, P.J.; Baird, J.; Arai, L.; Law, C.; Roberts, H.M. Worked examples of alternative methods for the synthesis of qualitative and quantitative research in systematic reviews. BMC Med. Res. Methodol. 2007, 7, 4.
[15] Ferreira, F.A. Mapping the field of arts-based management: Bibliographic coupling and co-citation analyses. J. Bus. Res. 2018, 85, 348–357.
[16] Cartwright, S.; Liu, H.; Raddats, C. Strategic use of social media within business-to-business (B2B) marketing: A systematic literature review. Ind. Mark. Manag. 2021, 97, 35–58.
[17] Goyal, K.; Kumar, S. Financial literacy: A systematic review and bibliometric analysis. Int. J. Consum. Stud. 2020, 45, 80–105.
[18] Rezvani, Z.; Jansson, J.; Bodin, J. Advances in consumer electric vehicle adoption research: A review and research agenda. Transp. Res. Part D Transp. Environ. 2015, 34, 122–136.
[19] Helveston, J.P.; Liu, Y.; Feit, E.M.; Fuchs, E.; Klampfl, E.; Michalek, J.J. Will subsidies drive electric vehicle adoption? Measuring consumer preferences in the US and China. Transp. Res. Part A Policy Pract. 2015, 73, 96–112.
[20] Mersky, A.C.; Sprei, F.; Samaras, C.; Qian, Z.S. Effectiveness of incentives on electric vehicle adoption in Norway. Transp. Res. Part D Transp. Environ. 2016, 46, 56–68.
[21] She, Z.Y.; Sun, Q.; Ma, J.J.; Xie, B.C. What are the barriers to widespread adoption of battery electric vehicles? A survey of public perception in Tianjin, China. Transp. Policy 2017, 56, 29–40.
[22] Jansson, J.; Nordlund, A.; Westin, K. Examining drivers of sustainable consumption: The influence of norms and opinion leadership on electric vehicle adoption in Sweden. J. Clean. Prod. 2017, 154, 176–187.
[23] Wang, S.; Wang, J.; Li, J.; Wang, J.; Liang, L. Policy implications for promoting the adoption of electric vehicles: Do consumers knowledge, perceived risk and financial incentive policy matter? Transp. Res. Part A Policy Pract. 2018.
[24] Junquera, B.; Moreno, B.; Álvarez, R. Analyzing consumer attitudes towards electric vehicle purchasing intentions in Spain: Technological limitations and vehicle confidence. Technol. Forecast. Soc. Change 2016,
[25] Bailey, J.; Miele, A.; Axsen, J. Is awareness of public charging associated with consumer interest in plug-in electric vehicles? Transp. Res. Part D Transp. Environ. 2015.
[26] Mohamed, M.; Higgins, C.; Ferguson, M.; Kanaroglou, P. Identifying and characterizing potential electric vehicle adopters in Canada: A two-stage modelling approach. Transp. Policy 2016, 52, 100–112.
[27] Singh, V.; Singh, V.; Vaibhav, S. A review and simple meta-analysis of factors influencing adoption of electric vehicles. Transp. Res. Part D Transp. Environ. 2020, 86, 102436.
[28] Koseoglu, M.A.; Rahimi, R.; Okumus, F.; Liu, J. Bibliometric studies in tourism. Ann. Tour. Res. 2016, 61, 180–198.
[29] Mulet-Forteza, C.; Genovart-Balaguer, J.; Mauleon-Mendez, E.; Merigó, J.M. A bibliometric research in the tourism, leisure and hospitality fields. J. Bus. Res. 2019, 101, 819–827.
[30] Almansour, M. Electric vehicles (EV) and sustainability: Consumer response to twin transition, the role of e-businesses and digital marketing. Technol. Soc. 2022, 71, 102135.
[31] Adu-Gyamfi, G.; Song, H.; Obuobi, B.; Nketiah, E.; Wang, H.; Cudjoe, D. Who will adopt? Investigating the adoption intention for battery swap technology for electric vehicles. Renew. Sustain. Energy Rev. 2022, 156, 111979.

[32] Li, L.; Wang, Z.; Wang, Q. Do policy mix characteristics matter for electric vehicle adoption? A survey-based exploration. Transp. Res. Part D Transp. Environ. 2020, 87, 102488.
[33] Shakeel, U. Electric vehicle development in Pakistan: Predicting consumer purchase intention. Clean. Responsible Consum. 2022, 5, 100065.
[34] Jaiswal, D.; Kaushal, V.; Kant, R.; Singh, P.K. Consumer adoption intention for electric vehicles: Insights and evidence from Indian sustainable transportation. Technol. Forecast. Soc. Change 2021, 173, 121089.
[35] Zhou, M.; Long, P.; Kong, N.; Zhao, L.; Jia, F.; Campy, K.S. Characterizing the motivational mechanism behind taxi driver's adoption of electric vehicles for living: Insights from China. Transp. Res. Part A Policy Pract. 2021, 144, 134–152.
[36] Featherman, M.; Jia, S.J.; Califf, C.B.; Hajli, N. The impact of new technologies on consumers beliefs: Reducing the perceived risks of electric vehicle adoption. Technol. Forecast. Soc. Change 2021, 169, 120847.
[37] Chu, W.; Im, M.; Song, M.R.; Park, J. Psychological and behavioral factors affecting electric vehicle adoption and satisfaction: A comparative study of early adopters in China and Korea. Transp. Res. Part D Transp. Environ. 2019, 76, 1–18.
[38] Langbroek, J.H.; Cebecauer, M.; Malmsten, J.; Franklin, J.P.; Susilo, Y.O.; Georén, P. Electric vehicle rental and electric vehicle adoption. Res. Transp. Econ. 2019, 73, 72–82.
[39] Li, L.; Wang, Z.; Chen, L.; Wang, Z. Consumer preferences for battery electric vehicles: A choice experimental survey in China. Transp. Res. Part D Transp. Environ. 2020, 78, 102185.
[40] Rezvani, Z., Jansson, J., & Bodin, J. (2015). Advances in consumer electric vehicle adoption research: A revie*w and research agenda*. Transportation Research Part D: Transport and Environment, 34, 122–136



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