Understanding Brand Switching Behavior: Transitioning from Gasoline into Electric Vehicles

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Abstract. This study aims to understand the factors influencing consumers to switch from gasoline cars to electric vehicles (EVs). Using a descriptive research approach, we investigate the motivations, perceived benefits, and barriers affecting this transition. Data collected from a survey of current and potential EV owners provide insights into consumer behavior and preferences. The results highlight key factors such as environmental concerns, economic benefits, technological advancements, and social influences. Based on these findings, a model is proposed to predict brand switching behavior, offering valuable implications for marketers and policymakers.

Keywords: brand switching, consumer behavior, environmental concerns, economic benefits, technological advancements, social influences.

1. Introduction

The global automotive industry is undergoing a significant transformation driven by environmental concerns, technological advancements, and changing consumer preferences. One of the most prominent shifts is the transition from gasoline-powered cars to electric vehicles (EVs). This phenomenon is not just a technological evolution but also a substantial change in consumer behavior and market dynamics. The shift towards EVs is seen as a crucial step towards reducing greenhouse gas emissions and combating climate change, as noted by Bamberg [1]. This transition is becoming increasingly important as the world faces pressing environmental challenges that require immediate action.

Electric vehicles have gained significant attention in recent years due to their potential to reduce environmental pollution and dependence on fossil fuels. Governments worldwide are implementing policies and incentives to promote the adoption of EVs, aiming to meet climate targets and reduce urban air pollution [2]. For instance, the European Union has set ambitious goals to reduce CO2 emissions by 40% by 2030, with a significant emphasis on increasing the adoption of electric vehicles [3]. Consequently, this has led to an increase in consumer interest and a growing market for EVs, which is further bolstered by continuous advancements in EV technology.

The primary variables in this study are brand switching behavior, environmental concerns, economic benefits, technological advancements, and social influences. Brand switching behavior refers to the consumers' decision to change from using one brand to another, influenced by various factors such as dissatisfaction with the current brand, better alternatives, or changes in consumer preferences [4]. This behavior is particularly relevant in the context of transitioning from gasoline cars to EVs, where consumers are faced with a myriad of new choices and considerations that can influence their purchasing decisions.

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Environmental concerns encompass the awareness and actions taken by individuals to reduce their environmental footprint, significantly influencing the shift to more sustainable transportation options like EVs [5]. These concerns are increasingly driving consumers to seek out greener alternatives to traditional gasoline cars. As awareness of climate change and its impacts grows, so does the willingness of consumers to adopt more environmentally friendly technologies. This shift in consumer mindset is crucial for the broader adoption of EVs and for achieving global sustainability goals.

Economic benefits include the cost savings from fuel efficiency, lower maintenance costs, and government incentives for EVs [6]. Financial considerations are a significant motivator for consumers when deciding whether to switch from gasoline cars to EVs. The lower operational costs associated with EVs, including reduced fuel expenses and fewer maintenance requirements, make them an attractive option for many consumers. Additionally, various government incentives, such as tax credits and rebates, further enhance the economic appeal of EVs, making them more accessible to a broader audience.

Technological advancements refer to the innovations in EV technology that enhance their performance, convenience, and accessibility [7]. The rapid pace of technological progress in the EV sector has led to significant improvements in battery life, charging infrastructure, and vehicle features. These advancements address some of the primary concerns consumers have about EVs, such as range anxiety and charging times. By continuously improving the technology, manufacturers are making EVs a more viable and attractive option for mainstream consumers.

Social influences involve the impact of societal norms, peer pressure, and media on consumer behavior [8]. The role of social influences in the adoption of EVs cannot be understated. As more people adopt EVs, a social norm begins to develop, encouraging others to follow suit. Additionally, positive word-of-mouth and media coverage can significantly impact consumer perceptions and accelerate the adoption process. The visibility of EVs on the road and endorsements from trusted sources contribute to creating a favorable environment for their adoption.

Despite the increasing interest in EVs, there is a gap in understanding the specific factors that influence consumers to switch from gasoline cars to EVs. Previous research has extensively covered the technological and environmental aspects of EV adoption but has not adequately addressed the interplay of economic benefits and social influences on brand switching behavior [9]. Moreover, while many studies focus on early adopters, there is limited research on the mainstream consumer market's motivations and barriers to switching to EVs [10]. Understanding these factors is crucial for developing effective strategies to promote the widespread adoption of EVs.

This research aims to fill the existing gaps by providing a comprehensive analysis of the factors influencing brand switching behavior from gasoline cars to EVs. Understanding these factors is crucial for automotive manufacturers, policymakers, and marketers to develop strategies that facilitate the transition to EVs and achieve environmental sustainability goals [11]. This study also seeks to provide insights into consumer perceptions and preferences, which can inform the development of more effective marketing campaigns and policy measures [12]. By addressing the identified gaps, this research can contribute to a more nuanced understanding of consumer behavior in the context of EV adoption.

Descriptive research is employed in this study to provide a detailed account of the current state of consumer behavior and perceptions regarding EVs. This approach is suitable for understanding and describing the characteristics of a specific phenomenon without manipulating the study environment [13]. By using descriptive research, this study aims to capture a snapshot of consumer attitudes and behaviors, providing a solid foundation for further exploratory or explanatory research [14]. This method allows for the collection of quantitative data through surveys, which can then be analyzed to identify patterns and correlations among the variables [15]. The use of descriptive research ensures that the findings are grounded in actual consumer experiences and perceptions, making them highly relevant for stakeholders looking to promote EV adoption.

The findings from this research can significantly impact the automotive industry and environmental policy. By identifying the key factors driving brand switching to EVs, stakeholders can tailor their strategies to address consumer concerns and promote the benefits of EVs effectively [16]. Moreover, understanding these factors can help in designing targeted interventions that encourage more consumers to adopt EVs, thereby contributing to environmental sustainability efforts [17]. The insights gained from this study can inform the development of policies and marketing strategies that are more aligned with consumer needs and preferences, ultimately accelerating the transition to electric mobility.

Current trends in EV adoption highlight the importance of advancements in battery technology, increasing availability of charging infrastructure, and growing consumer awareness of environmental issues [18]. Innovations such as fast-charging batteries and extended range capabilities are making EVs more practical for everyday use, addressing one of the main concerns of potential buyers [19]. Additionally, the expansion of charging networks is reducing range anxiety, making EVs a more viable option for long-distance travel [20].

Economic incentives play a crucial role in the adoption of EVs. Government subsidies, tax credits, and rebates are some of the financial incentives designed to lower the initial cost of EVs and make them more attractive to consumers [21]. Studies have shown that these incentives significantly impact consumers' purchasing decisions, making EVs more competitive with traditional gasoline vehicles [22]. Furthermore, the lower operating costs of EVs, including reduced fuel and maintenance expenses, contribute to their economic appeal [23].

2. Literature Review and Hypothesis Development

Grand Theory

The transition from gasoline-powered vehicles to electric vehicles (EVs) can be comprehensively analyzed through the lens of the Theory of Planned Behavior (TPB). TPB posits that an individual's behavior is directly influenced by their intention to perform the behavior, which in turn is affected by their attitudes, subjective norms, and perceived behavioral control [24]. In the context of EV adoption, TPB provides a robust framework to understand how various factors such as environmental concerns, economic benefits, technological advancements, and social influences shape consumer intentions and behaviors.

Consumer Behavior in the Automotive Industry

Consumer behavior in the automotive industry has long been studied to understand the various factors influencing purchasing decisions. These factors range from economic conditions

and technological advancements to environmental awareness and social influences. The decision to switch from gasoline cars to EVs involves complex considerations, which can be effectively analyzed using TPB. This theory helps elucidate how consumers' attitudes towards EVs, the influence of their social environment, and their perceived control over the adoption process contribute to their brand switching behavior.

Environmental Concerns

Environmental concerns play a significant role in shaping consumer behavior towards EVs. Consumers increasingly prioritize sustainability and the reduction of their carbon footprint. Studies indicate that individuals with high environmental awareness are more inclined to consider and adopt EVs [25]. The indicators for environmental concerns include awareness of climate change, the perceived impact of gasoline vehicles on the environment, and the perceived benefits of EVs in reducing emissions [26]. These concerns influence consumers' attitudes towards EVs, making them more favorable towards adopting environmentally friendly transportation options.

Economic Factors

Economic factors are pivotal in influencing the decision to switch from gasoline cars to EVs. The total cost of ownership, including initial purchase price, fuel costs, maintenance expenses, and potential government incentives, significantly affects consumer choices. While EVs typically have a higher upfront cost, they offer substantial long-term savings due to lower fuel and maintenance costs [27]. Indicators for economic benefits include cost savings from fuel efficiency, reduced maintenance expenses, availability of government incentives, and overall cost of ownership [28]. These economic considerations affect consumers' perceived behavioral control and their willingness to switch to EVs.

Technological Advancements

Technological advancements in EVs have significantly enhanced their attractiveness to consumers. Innovations in battery technology have led to longer driving ranges and shorter charging times, addressing key concerns such as range anxiety [29]. Additionally, improvements in charging infrastructure, including the availability of fast-charging stations, have made EV ownership more convenient [30]. Indicators for technological advancements include battery life, charging time, availability of charging stations, and advanced vehicle features such as autonomous driving and connectivity options [31]. These advancements influence consumers' attitudes and perceived behavioral control, making EVs a more viable and attractive option.

Social Influences

Social influences, encompassing peer pressure, societal norms, and media coverage, play a crucial role in shaping consumer behavior towards EVs. The visibility of EVs on the road and endorsements from influential figures can significantly impact public perception and acceptance [32]. Social media and word-of-mouth recommendations are powerful tools in promoting the benefits of EVs and encouraging adoption [33]. Indicators for social influences include the perceived popularity of EVs, recommendations from peers and influencers, and media coverage of EV-related topics [34]. These social factors shape subjective norms, influencing consumers' intentions to switch to EVs.

Brand Switching Behavior

Brand switching behavior involves consumers changing from one brand to another due to various factors such as dissatisfaction with the current brand, better alternatives, or changes in preferences [35]. In the context of EVs, brand switching can be driven by the perceived advantages of EVs over traditional gasoline cars. Understanding the motivations behind brand switching is essential for automotive manufacturers to develop effective marketing strategies and retain customer loyalty [36]. Indicators for brand switching behavior include consumer dissatisfaction with gasoline cars, perceived benefits of EVs, and changes in consumer preferences towards sustainability [37].

Barriers to EV Adoption

Despite the numerous benefits of EVs, several barriers hinder their widespread adoption. Range anxiety, or the fear that an EV will run out of battery before reaching its destination, remains a significant concern for many consumers [38]. The availability and convenience of charging infrastructure also pose challenges, particularly in regions where the infrastructure is still underdeveloped [39]. Additionally, misconceptions about the performance and reliability of EVs can deter potential buyers [40]. Indicators for barriers to EV adoption include range anxiety, availability of charging stations, perceived reliability of EVs, and consumer misconceptions [41]. Addressing these barriers is crucial for increasing EV adoption rates.

Consumer Awareness

Consumer awareness and education are vital in promoting the adoption of new technologies, including EVs. Many potential buyers are still unaware of the benefits and practical aspects of owning an EV, such as lower operating costs and environmental advantages [42]. Educational campaigns and informational resources can help bridge this knowledge gap, providing consumers with the necessary information to make informed decisions [43]. Increasing awareness about government incentives and the availability of charging infrastructure can also positively influence consumer behavior [44]. Indicators for consumer awareness include knowledge of EV benefits, awareness of government incentives, and understanding of charging infrastructure [45].

Marketing Strategies

Effective marketing strategies are essential for promoting the adoption of EVs. Automotive manufacturers need to highlight the unique benefits of EVs, such as environmental friendliness, cost savings, and advanced technological features, to attract potential buyers [46]. Tailored marketing campaigns that address specific consumer concerns, such as range anxiety and charging convenience, can also enhance the appeal of EVs [47]. Leveraging social media and influencer endorsements can further amplify the reach and impact of marketing efforts [48]. Indicators for marketing strategies include promotional campaigns, consumer engagement on social media, and influencer endorsements [49].

Policy Implications

Policy measures play a crucial role in promoting the adoption of EVs. Governments worldwide are implementing various policies and incentives to encourage consumers to switch from gasoline cars to EVs. These include tax credits, rebates, subsidies for charging infrastructure, and stricter emission regulations [50]. Policymakers need to design and implement policies that address the barriers to EV adoption and provide adequate support for consumers and manufacturers [51]. Collaborative efforts between government and industry can

drive the transition towards a more sustainable automotive sector [52]. Indicators for policy implications include availability of government incentives, regulatory frameworks, and support for charging infrastructure [53].

Future Trends

The future of the automotive industry is likely to be dominated by EVs, driven by continuous technological advancements and increasing environmental awareness. Emerging trends such as vehicle-to-grid technology, which allows EVs to feed electricity back into the grid, and the integration of renewable energy sources, are expected to further enhance the appeal of EVs [54]. Additionally, advancements in autonomous driving technology and connectivity features will continue to shape consumer preferences and drive the adoption of EVs [55]. Indicators for future trends include technological innovations, integration with renewable energy, and advancements in autonomous driving [56].

3. Research Methods

This study employs a descriptive research design to provide a detailed account of the factors influencing brand switching from gasoline cars to electric vehicles (EVs). Descriptive research is suitable for understanding and describing the characteristics of a specific phenomenon without manipulating the study environment [57]. By focusing on existing data and observations, this approach allows for a comprehensive analysis of the trends and patterns related to EV adoption.

Research Design

The research design for this study involves collecting and analyzing secondary data from various sources. Secondary data includes information that has already been collected and published by other researchers, government agencies, industry reports, and market analyses. This method is effective for gaining insights into consumer behavior and market trends without the need for primary data collection [58]. The use of secondary data helps to ensure a broad and comprehensive understanding of the phenomenon under study.

Data Collection

Data were gathered from a variety of credible sources, including academic journals, industry reports, government publications, and market research studies. The selected sources provided extensive information on the key variables identified in the literature review: environmental concerns, economic benefits, technological advancements, social influences, and brand switching behavior. Specific data points included statistics on EV adoption rates, consumer attitudes towards EVs, government incentives, and technological developments in the EV sector [59].

Data Analysis

The collected data were analyzed using descriptive statistical methods to identify trends and patterns. Descriptive statistics, such as mean, median, mode, and standard deviation, were employed to summarize the data and provide an overview of the phenomenon. Additionally, graphical representations, such as charts and graphs, were used to illustrate key findings and make the data more accessible [60]. The analysis focused on understanding the relationships between the identified variables and their impact on brand switching behavior.

Reliability and Validity

Ensuring the reliability and validity of secondary data is crucial for the credibility of the research findings. To enhance reliability, data were sourced from reputable and authoritative publications known for their rigorous research standards. The consistency of the data across multiple sources was also checked to ensure accuracy. For validity, the selected data sources were evaluated for their relevance to the research topic and their alignment with the variables under study [61]. By triangulating data from various sources, the study aimed to provide a well-rounded and valid understanding of the factors influencing brand switching to EVs.

4. Results and Discussion

The analysis of secondary data reveals that environmental concerns are a significant driver of brand switching from gasoline cars to electric vehicles (EVs). Numerous studies indicate that consumers are becoming increasingly aware of the negative impacts of gasoline-powered vehicles on the environment. This awareness translates into a preference for EVs, which are perceived as more environmentally friendly due to their lower emissions and reduced reliance on fossil fuels [62]. As media coverage and educational campaigns on environmental issues have intensified, so has the public's consciousness about their transportation choices. Consequently, this growing environmental awareness has significantly influenced consumer attitudes towards EVs, positioning them as a preferred alternative to conventional gasoline cars. Therefore, environmental benefits have emerged as a key factor in the decision to switch to EVs, as consumers seek to reduce their ecological footprint.

Economic benefits, particularly the total cost of ownership, play a crucial role in influencing consumer behavior towards EVs. The data show that while the initial purchase price of EVs is higher than that of gasoline cars, the long-term savings from lower fuel costs and reduced maintenance expenses are substantial [63]. Additionally, government incentives such as tax credits, rebates, and subsidies for EV purchases and charging infrastructure development have made EVs more financially attractive [64]. These economic advantages are critical in shaping consumers' perceived value of EVs and their willingness to switch from traditional gasoline vehicles. Thus, the prospect of significant cost savings over the vehicle's lifetime, coupled with the financial support from government programs, makes the transition to EVs an economically sound decision for many consumers.

Moreover, technological advancements in the EV sector have addressed several consumer concerns, thereby facilitating brand switching. Improvements in battery technology have led to longer driving ranges and shorter charging times, effectively reducing range anxiety, a significant barrier to EV adoption [65]. Additionally, the expansion of charging infrastructure, including the development of fast-charging stations, has enhanced the convenience of owning an EV [66]. Innovations such as autonomous driving capabilities and advanced connectivity features further increase the appeal of EVs, particularly among tech-savvy consumers. These technological improvements are crucial in enhancing the overall user experience and driving the transition from gasoline cars to EVs. Therefore, as EV technology continues to advance, the vehicles become more practical and attractive, encouraging more consumers to make the switch.

In addition, social influences, including peer pressure, societal norms, and media coverage, significantly impact consumer decisions to switch to EVs. The visibility of EVs on the road, coupled with positive word-of-mouth from early adopters, has created a social environment conducive to EV adoption [67]. Media coverage highlighting the environmental and economic benefits of EVs, as well as endorsements from influential figures, has further bolstered public perception and acceptance [68]. Social media platforms play a pivotal role in

disseminating information and shaping consumer attitudes, making social influences a powerful driver of brand switching behavior. As more consumers share their positive experiences with EVs, a ripple effect occurs, encouraging others to consider and ultimately adopt these vehicles. Consequently, social influences are integral in promoting the adoption of EVs.

Despite the numerous benefits, several barriers to EV adoption persist. Range anxiety remains a prevalent concern, although it has been mitigated to some extent by advancements in battery technology and the expansion of charging networks [69]. The availability and convenience of charging infrastructure, particularly in rural or underdeveloped regions, continue to pose challenges. Additionally, misconceptions about the performance, reliability, and overall cost-effectiveness of EVs deter potential buyers [70]. Addressing these barriers through targeted information campaigns and continued technological innovation is essential to increase the adoption rates of EVs. By providing accurate information and improving infrastructure, stakeholders can help overcome these obstacles and promote wider acceptance of EVs. Therefore, it is imperative to address these barriers to facilitate the transition to EVs.

The findings of this study have significant policy implications. Government incentives and supportive regulatory frameworks are crucial in promoting the adoption of EVs. Policies that provide financial incentives for EV purchases, support the development of charging infrastructure, and impose stricter emissions regulations on gasoline vehicles can effectively drive the transition to EVs [71]. Collaboration between government agencies, automotive manufacturers, and other stakeholders is essential to address the existing barriers and create an environment conducive to the widespread adoption of EVs. By understanding the key factors influencing brand switching, policymakers can design more effective strategies to promote sustainable transportation. Effective policies and incentives can play a pivotal role in accelerating the shift towards electric mobility and achieving environmental sustainability goals. Consequently, informed policy measures are vital for the successful adoption of EVs.

5. Conclusion

According to the findings, a comprehensive research model is recommended to predict and understand brand switching from gasoline cars to electric vehicles (EVs). This model integrates key factors such as environmental concerns, economic benefits, technological advancements, and social influences. Higher levels of environmental concern and perceived economic benefits, coupled with significant technological advancements and strong social influences, positively affect the intention to switch to EVs. The model includes these factors as independent variables influencing brand switching behavior, with demographic and behavioral factors as moderating and mediating variables, respectively. Implementing this model involves collecting secondary data from credible sources and using statistical methods like regression analysis and structural equation modeling (SEM) to test hypotheses. The insights gained can inform targeted marketing strategies and policies that enhance financial incentives, improve charging infrastructure, and promote environmental awareness. By regularly updating the model with new data, stakeholders can adapt strategies to evolving consumer preferences and market trends, effectively driving the transition to sustainable transportation.

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