Electrifying Customer Satisfaction and Loyalty: A Structural Equation Modelling Approach in the Indian Four-Wheeler Electric Vehicle Industry

Anik Ghosh

Assistant Professor,
Department of Management
398, Ramkrishnapur Rd, near Jagadighata Market
Barasat, Kolkata, West Bengal 700125
Brainware University
Email: anikghosh1994@gmail.com

Ayan Kumar Dey

Management Student,
Department of Management
398, Ramkrishnapur Rd, near Jagadighata Market
Barasat, Kolkata, West Bengal 700125
Brainware University,

Abstract: *The Indian electric four-wheeler industry is undergoing rapid transformation, propelled by environmental challenges and government policies promoting sustainable transportation. Understanding the factors that influence customer satisfaction and loyalty among electric vehicle (EV) customers is crucial for manufacturers and policymakers. This research investigates determinants of customer satisfaction and loyalty in the Indian four-wheeler EV industry using structural equation modelling (SEM). The research focused on individuals residing in Kolkata and gathered 356 responses. A structural equation model was developed to analyze the relationships between the established five dimensions of EV service quality—price, online reviews, perceived societal concern, recharging infrastructure, and attributes—and customer satisfaction and loyalty. The findings revealed that all five dimensions positively influence customer satisfaction and loyalty among potential EV buyers. Additionally, satisfied potential customers exhibit greater loyalty to EVs. These insights contribute to literature on customer satisfaction and loyalty in the Indian four-wheeler EV industry, enhancing understanding of these dynamics while providing valuable insights for manufacturers, policymakers and marketers targeting prospective buyers. The findings offer a foundation for strategies to improve customer satisfaction and loyalty, thereby fostering EV adoption and acceptance in India and contributing to sustainable transportation sector development and reduced carbon emissions.*

Keywords: *Customer Satisfaction, Customer Loyalty, Electric Vehicle Industry and Transportation*

Introduction

The burgeoning population of India places significant strain on the environment, with the automotive sector emerging as a key contributor to this challenge. Vehicle emissions, traffic congestion, energy consumption, land use, infrastructure demands, and waste generation collectively present substantial environmental hurdles, primarily attributed to the automotive

industry. In response to these challenges, a sustainable transportation approach, epitomized by the integration of electric vehicles (EVs), emerges as a crucial strategy.

Although electric vehicles offer substantial environmental benefits, they do come with challenges. Issues like limited driving ranges, long recharging times, high initial costs, and inconsistent charging infrastructure present significant obstacles. However, ongoing technological advancements hold the potential to overcome these drawbacks. Progress in battery technology, for example, promises extended battery life and improved performance, addressing these limitations. These advancements not only enhance the feasibility and attractiveness of electric vehicles but also indicate a positive trend toward a more sustainable and efficient transportation system. Nevertheless, when compared to traditional gasoline vehicles, electric vehicles still have a net positive environmental impact.

In India, the Electric Vehicles (EVs) sector is undergoing a transformative surge, buoyed by governmental initiatives like the Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles in India (FAME India) project, which has propelled EVs into the mainstream. Globally, the EV market is experiencing remarkable growth, with forecasts indicating a surge to USD 1,579.10 billion by 2030, driven by a compelling Compound Annual Growth Rate (CAGR) of 17.8%. Similarly, India's EV market is poised to reach USD 113.99 billion by 2029, demonstrating a Compound Annualized Growth of 66.52% from 2022 to 2029.

In India's evolving EV industry, on-going research seeks to explore customer satisfaction, the EV ownership experience, and the relationship between satisfaction and loyalty. This research aims to unravel the connections among charging infrastructure, range anxiety, cost-effectiveness, vehicle performance, environmental impact, government policies, customer satisfaction, and loyalty, fostering sustainable growth and development in the sector.

Review of Past Studies

Electric vehicles (EVs) have a lineage tracing back to the early 1900s when they flourished in popularity, only to fade into obscurity by 1918 (**Chan, 1993**). This decline was not due to shortcomings but rather relentless enhancements of gasoline-powered internal combustion engine vehicles as formidable competitors (**Bates, 1992**).

Contemporary full electric vehicles have all-electric drive trains drawing vitality from rechargeable batteries and electricity grids, unlike predecessors with limited ~100 km ranges and long recharging times that deterred potential adopters (**Graham-Rowe et al., 2012; Cheron & Zins, 1997**). Persistent hurdles have been higher initial prices compared to conventional cars (**Bunch et al., 1993; Calfee, 1985**). However, recent advancements have surmounted this limitation through impressive ~250 km ranges, attractive designs across vehicle sizes.

Within the domain of electric vehicles (EVs), the trajectory towards success is intricately intertwined with consumer acceptance, as elucidated by prior research (**Potoglou&Kanaroglou, 2007; Ozaki & Sevastyanova, 2011**). This acceptance is closely linked to individuals' reservoir of knowledge concerning EVs (**CFA, 2015**). Interestingly, even individuals with substantial knowledge about EVs often lack awareness regarding inherent fuel-saving capabilities (**Gyimesi & Viswanathan, 2011**) and governmental incentives (**Kurani, Caperello, & Tyree-Hageman, 2016**). The majority of consumers are unaware of such intricacies, underscoring the need for concerted efforts aimed at enhancing awareness to foster growth (**Zhang, Yu, & Zou, 2011**).

The media and social networks are paramount in overcoming awareness barriers and advocating EVs. Peer reviews and innovative technology appeals harmoniously call for change (**Figenbaum, Kolbenstvedt, & Elvebakk, 2014**). A consistent motif resonates on a correlation between EV adoption and age/education. Eco-conscious younger generations embrace EVs while educated individuals attuned to

conventional vehicle ecological echoes find solace in this technology **(Afroz et al., 2013; Hackbarth & Madlener, 2013; Carley et al., 2013).** However, in certain contexts, highly educated and EV limitation-informed consumers exhibit reluctance towards short-term adoption **(Zhang, Yu, & Zou, 2011)**.

Contrastingly though, **Sierzchula et al. (2014)** and **Hidrue et al. (2011)** found no discernible EV adoption links to financial status or education. They posit heightened income doesn't inherently sway EV favor, and paradoxically, may cast an adoption shadow. Herein lays choice complexity, where demographics, knowledge and socioeconomics coalesce into a multifaceted tapestry guiding adoption trajectories.

While electric vehicle market growth remains promising, research by **Rezvani et al. (2015)** shed light on the complex consumer decision-making web that must be navigated towards sustainable transportation futures.

Amid eco-conscious consumerism, a responsibility shift has occurred attributing environmental safeguarding to consumers **(Gadenne et al., 2011)**. Literature underscores consumer values and lifestyles pivotally shaping green purchasing behaviour **(Haanpaa, 2007; Khare, 2015).** Employing an Environmental Index measuring environmental awareness, EVs are primarily embraced by cohorts including environmentalists, early adopters, urban tech-savvy youth and higher-income individuals **(Talantsev, 2017; Axsen et al., 2015)**. **Asadi et al. (2021)** asserts EVs pivotal in addressing concerns, with recognition of pollution reduction potential motivating adoption to minimize ecological footprints towards more sustainable resource-conscious lives **(Mohamed et al., 2018; Skippon& Garwood, 2011; Ozaki & Sevastyanova, 2011)**. This symbiosis underscores a transformative sustainability pathway.

Consistent themes gleaned from consumer surveys centre on the significant financial barrier posed by the high purchase prices of electric vehicles (EVs), corroborating earlier findings **(She et al., 2017; Carley et al., 2013)**. The elevated costs of EV manufacturing, as highlighted **by Noel et al. (2020)**, contribute to this challenge. Nonetheless, **Boztepe's (2016)** research offers optimism by revealing consumers' willingness to invest more in eco-consciousness, driven by perceptions of widespread industrialization as a contributor to pollution, with EVs seen as a partial solution. The essence of the matter lies in the potential underestimation of the lower operational costs and long-term savings derived from reduced servicing and maintenance compared to internal combustion engine vehicles (ICEs) **(Krause et al., 2013)**. This dilemma between initial costs and future benefits underscores the nuanced relationship between consumer awareness and the economic advantages of EVs.

Customer satisfaction signifies contentment when service quality surpassing anticipated quality elicits delight **(Kotler, 2000).** It stems from evaluating perceived differences between expectations and real-world performance **(Tse and Wilton, 1988).Zeithaml et al. (1996)** define it as fulfilment responses encompassing product or service feature judgments and overall offering appraisals that ensure satisfying consumption-related fulfilment. This nexus between CS and meeting customer needs forms service quality evaluation bedrocks **(Hill, Brierly, & MacDougall, 2017)**. The satisfaction fulcrum is aligning performance with expectations, with emerging satisfaction/dissatisfaction accordingly **(Swan & Combs, 1976)**.

The interconnection between prosperity and sustained growth lies in customer satisfaction and loyalty, widely recognized in business literature **(Knox, 1998; Oliver, 1999)**. Customer loyalty signifies a deep commitment driving consistent repurchasing and patronage, crucial for retention and CS impacts **(Bodet, 2008).** However, **Shankar et al. (2003)** highlights dissatisfied customers' propensity to switch stores, emphasizing the delicate balance in this dynamic. While evidence supports the correlation between customer satisfaction and

loyalty, differing perspectives by **Vazquez-Carrasco and Foxall (2006)** and **Ellram et al. (1999),** suggest not all satisfied customers exhibit loyalty. Additionally, repeat customers, as noted by **Suhartanto et al. (2018)** and **Kim et al. (2009),** tend to spend more generously than newcomers. Long-term customer relationships require delivering exceptional benefits driving premium pricing, referrals, and operational efficiency enhancements, fostering a cycle of business success.

In the EV domain, prior research has examined diverse aspects, yet the nuanced relationship between satisfaction and loyalty remains unexplored, particularly within the Indian EV market context. This pioneering study addresses this gap by scrutinizing how EV Service Quality influences loyalty and satisfaction in India's burgeoning EV sector, offering invaluable insights into its dynamics.

Hypotheses

H1: There is no significant relationship between price and customer satisfaction.

H2: There is no significant relationship between online reviews and customer satisfaction.

H3: There is no significant relationship between perceived societal concern and customer satisfaction.

H4: There is no significant relationship between recharging infrastructure and customer satisfaction.

H5: There is no significant relationship between Attributes and customer satisfaction.

H6: There is no significant relationship between customer satisfaction& customer loyalty.

Research Method

The researchers adopted a quantitative methodology, employing a structured questionnaire to gather primary data from both current and prospective electric vehicle purchasers across metropolitan and non-metropolitan areas in India. The questionnaire comprised two sections: one gathering socio-demographic information and the other consisting of Likert-scale items to gauge respondents' agreement levels with study variables, ranging from 1 to 7. Data analysis and hypothesis testing were conducted using Structural Equation Modelling (SEM) via the AMOS program version 25.0. SEM offers a robust method for examining hypothesized relationships between theoretical constructs and their empirical expressions. A total of 589 questionnaires were distributed, and 385 were returned, resulting in a response rate of approximately 66%. However, 29 questionnaires were excluded due to incompleteness or incorrect completion. Consequently, the effective sample size for this study was reduced to 356, which surpasses the recommended threshold of 200 for conducting SEM data analysis **(Hoogland & Boomsma, 1998; Kline, 2005).**

Research Model
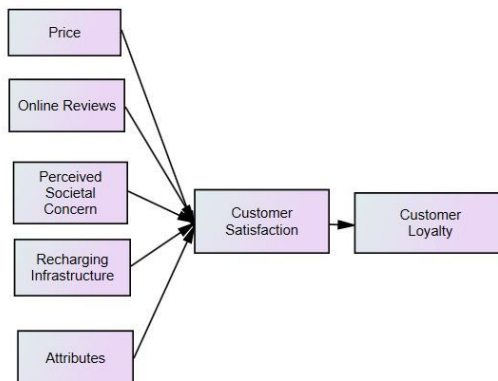
Data Analysis & Interpretation
Table 1: Reliability test

Variables	Cronbach's Alpha	No. of Items
Price	0.817	4
Online reviews	0.821	7
Perceived societal concern	0.834	6
Recharging infrastructure	0.98	5
Attributes	0.856	7
Customer Satisfaction	0.878	4
Customer Loyalty	0.862	4

To analyze the reliability of our measuring tool, we employed the widely recognized "Cronbach Alpha" statistic. The results of this reliability test, as depicted in Table 1, provide a robust foundation for our research. The obtained values surpass the recommended threshold of 0.7, as suggested by Kline (2005), and DeVellis & Thorpe (2021). This outcome signifies that the items utilized in our study exhibit a high level of reliability in measuring the defined constructs.

Table 2: AMOS-Summary Statistics for model fit

Model fit index	Recommended values	Recommended by	Observed values
Chi-square/degrees of freedom	<5	(Tabachnick, Fidell, & Ullman, 2013)	1.678
GFI	>0.80	(Hair, 2010)	0.989
AGFI	>0.80	(Hair, 2010)	0.90
CFI	>0.90	(Carmines, 1981)	0.956
RMSEA	<0.05	(Byrne, 2013)	0.03
TLI	>0.90	(Hu & Bentler, 1999)	0.978

The analysis of model fit statistics offers critical insights into the alignment between the proposed model and the observed data. Beginning with the Chi-square to degrees of freedom ratio, the calculated value of 1.678 falls well below the conventional threshold of 5, indicating a favourable fit and suggesting that the model effectively captures the data's variance without undue complexity. The Goodness of Fit Index (GFI) and its adjusted variant (AGFI), both indices exhibit strong performance, with values of 0.989 and 0.90, respectively, indicating a substantial proportion of explained variance in the data.

Further examination of the Comparative Fit Index (CFI) reveals a robust fit, surpassing the widely accepted threshold of 0.90 with a value of 0.956. Root Mean Square Error of Approximation (RMSEA) demonstrates an excellent fit, with a value of 0.03, well below the recommended threshold of 0.05, suggesting minimal discrepancy between the model and the population covariance matrix.

The Tucker-Lewis Index (TLI) showcases strong performance, exceeding the threshold of 0.90 with a value of 0.978, indicating a favourable fit relative to a null model. Collectively, these findings underscore the efficacy of the proposed model in representing the underlying data structure. The model's consistent adherence to or surpassing of recommended fit thresholds across various indices instils confidence in its reliability and suitability for further analysis within the context of the research domain.

Table 3: Demographic Study of the respondent

Demographic Data of the respondent		Count	%
Age	18-28	178	50
	29-39	87	24.44
	40-50	42	11.8
	50+	49	13.76
Marital Status	Married	235	66.01
	Un-married	121	33.99
Sex	Male	210	58.99
	Female	146	41.01
Educational Qualification	Undergraduate	89	25
	Master	150	42.13
	Doctor & Above	117	32.87
Residence	Metro	218	61.24
	Non-metro	138	38.76
Monthly Income	Below 20,000	26	7.3
	20,001-30,000	50	14.04
	30,001-40,000	60	16.85
	40,001-50,000	110	30.9
	Above 50,000	110	30.9
Total		356	100

The demographic study of the respondents reveals a diverse range of characteristics among the surveyed population. The majority, constituting 50%, fall within the age range of 18-28, indicating a significant presence of young adults. Additionally, 66.01% of respondents are married, while 33.99% are unmarried, suggesting a balanced representation of marital statuses. In terms of gender distribution, 58.99% of respondents are male, slightly outnumbering the 41.01% who are female. Educationally, the highest proportion (42.13%) holds a Master's degree, followed closely by 32.87% with a Doctorate or higher qualification, and 25% with an undergraduate degree. Geographically, 61.24% of respondents reside in metro areas, with the remaining 38.76% living in non-metro areas. The income distribution among respondents varies significantly. The majority cluster in higher brackets, with 110 individuals reporting incomes above Rs40,001-Rs50,000, and another 110 reporting incomes above Rs50,000, each constituting approximately 30.9%. Additionally, 60 individuals (16.85%) fall within the Rs30,001-Rs40,000 range, while 50 (14.04%) report incomes between Rs20,001-Rs30,000. The smallest segment comprises 26 individuals (7.3%) earning below Rs20,000.

Table 4: Relationship between Service Quality Dimensions and Customer Satisfaction in the EV Sector

		Price	Online reviews	Perceived societal concern	Recharging infrastructure	Attributes
Customer Satisfaction	Pearson Correlation	.814**	.719**	.680**	.658**	.230**
	Sig. (2-tailed)	0	0	0	0	0
	N	356	356	356	356	356
**. Correlation is significant at the 0.01 level (2-tailed).						

Table 4 presents a comprehensive examination of the changing interrelation among various aspects of service quality within the Electric Vehicle (EV) industry and its impact on customer satisfaction. Utilizing Pearson correlation coefficients, this analysis reveals insightful findings. Notably, the findings highlight robust and statistically significant positive correlations between customer satisfaction and several pivotal dimensions. Specifically, dimensions such as Price (0.814**), Online reviews (0.719**), Perceived societal concern (0.680**), and Recharging infrastructure (0.658**) demonstrate strong positive associations with customer satisfaction. Furthermore, although to a somewhat lesser degree, Attributes (0.230**) also exhibit a positive correlation. The consistently minimal p-values (0) across all dimensions unequivocally affirm the statistical significance of these correlations.

Table 5: Relationship between Customer Satisfaction & Customer Loyalty in the Electric Vehicle Sector

		Customer Loyalty
Customer Satisfaction	Pearson Correlation	.758**
	Sig. (2-tailed)	0
	N	356
**. Correlation is significant at the 0.01 level (2-tailed).		

Table 5 demonstrates a robust and statistically significant correlation (0.758**) between customer satisfaction and customer loyalty within the Electric Vehicle (EV) industry. This significant association emphasizes that as customer satisfaction increases, so does customer loyalty within the Electric Vehicle industry.

Table 6: Regression weights

Regression Weights							
			Estimate	S.E.	C.R.	P	Label
Customer Satisfaction	<---	Price	0.451	0.077	5.881	***	
Customer Satisfaction	<---	Online reviews	0.224	0.058	3.873	***	
Customer Satisfaction	<---	Perceived societal concern	0.21	0.056	3.562	***	
Customer Satisfaction	<---	Recharging infrastructure	0.316	0.082	3.619	***	
Customer Satisfaction	<---	Attributes	0.221	0.056	3.870	***	
Customer Loyalty	<---	Customer Satisfaction	0.36	0.06	6.014	***	

Table 6 presents the regression relationships between customer satisfaction and the five established hypotheses, as well as the association between customer satisfaction and loyalty.

Price emerges as a potent catalyst, exerting a robust and positive influence (0.451***), emphasizing its resonance with customers and its role in driving heightened satisfaction. This finding is consistent with prior research by Srikanjanarak and Ramayah (2009) and Martin-Consuegra et al. (2007), highlighting the significant impact of price on customer satisfaction. Moreover, our results align with studies by Hassan et al. (2013), Nalendra (2018), and Thungasal (2019), emphasizing the interconnectedness of service quality, pricing, satisfaction, and loyalty. These collective findings underscore the importance of perceived price fairness in influencing customer loyalty,

highlighting the intricate relationship between these factors in shaping satisfaction.

Concurrently, the influence of online reviews on customer satisfaction is unmistakable, underscored by a substantial positive effect (0.224***). Building on insights derived from Guo et al. (2017), Farhadloo et al. (2016), and Tirunillai& Tellis (2014), customer satisfaction is construed as a subjective evaluation moulded by the contours of online feedback. Online reviews, functioning as tangible manifestations of user experiences, not only exert an immediate impact on satisfaction but also dynamically mould future sentiments (Pournarakis et al., 2017; Guo et al., 2016; Farhadloo et al., 2016). This holds immense value for both managerial decision-makers and researchers, providing an indispensable resource for delving into the intricacies of customer satisfaction.

In addition to the significant perceived societal concern (0.21***), the relationship between perceived value and customer satisfaction holds crucial importance, as heightened perceived value positively influences overall satisfaction. Previous research indicates a favourable impact of perceived environmental responsibility and social concerns on customer satisfaction (Yuen et al., 2016; Pérez et al., 2013; Matute et al., 2010). Companies that exhibit environmental and social responsibility not only contribute to customer satisfaction but also foster increased loyalty (Moisescu, 2018; Pérez et al., 2013; Choi & La, 2013). These findings emphasize the profound importance of companies actively showcasing environmental and social responsibility in the pursuit of both customer satisfaction and loyalty.

The commanding influence of recharging infrastructure (0.316***) on Customer Satisfaction is evident. Charging satisfaction, a pivotal aspect of EV user experience, encompasses infrastructure accessibility and charging convenience. Charging infrastructure accessibility emerges as a crucial determinant of EV user satisfaction, consistent with findings of Salah and Kama (2016). These observations align with international studies in Sweden (Vassileva& Campillo, 2017), the UK (Neaimeh et al., 2017), and Germany (Trommer et al., 2015), emphasizing the significant impact of charging satisfaction on user satisfaction within the Electric Vehicles landscape.

The findings also reveal a strong correlation between "Attributes" and "Customer Satisfaction" (p < 0.001, β = 0.221), indicating a significant and positive impact. Each incremental improvement in Attributes leads to an anticipated increase of 0.221 units in customer satisfaction. These results are consistent with prior research highlighting the critical role of product attributes, including brand, packaging, and quality labels, in shaping customer satisfaction (Dimyati, 2012; Harun, 2015; Nugroho et al., 2015). Hence, prioritizing the development and delivery of these attributes is essential for businesses to enhance satisfaction and foster loyalty, aligning with established research and emphasizing their strategic importance in the customer experience.

In the complex realm of Customer Satisfaction, a robust positive relationship (0.36***) emerges between Customer Satisfaction and Customer Loyalty in the Electric Vehicle sector. Previous research consistently affirms that heightened customer satisfaction significantly boosts loyalty, creating a symbiotic connection (Anwar et al., 2019; Minta, 2018). This synergy extends to trust, where customer satisfaction influences trust, solidifying their interconnectedness (Lenin kumar, 2017). As committed customers evolve into brand advocates, this interconnectedness fosters an upward spiral of loyalty, encapsulating the dynamics of customer satisfaction, loyalty, and trust in a resilient customer-brand relationship (Aprilia et al., 2020).

Conclusion

In conclusion, this research significantly contributes to both academia and the Indian Electric Vehicle (EV) industry by deepening our understanding of customer satisfaction and loyalty dynamics. Despite the substantial growth of the Indian EV market, there has been limited exploration of these essential aspects. This study addresses this gap by examining the impact of

five dimensions—price, online reviews, perceived societal concern, recharging infrastructure, and attributes—on customer satisfaction in the EV sector.

The findings highlight the critical role of factors such as price, online reviews, and recharging infrastructure in shaping customer satisfaction. Affordable pricing and positive online feedback emerge as key predictors of satisfaction, underscoring their importance for EV manufacturers. These insights have significant implications for businesses aiming to excel in the Indian EV industry, emphasizing the need for competitive pricing strategies and proactive online reputation management.

From an academic standpoint, this study enriches consumer behaviour research by elucidating the complex relationships among various dimensions and their cumulative impact on customer satisfaction and loyalty. Additionally, the comprehensive dataset established offers opportunities for longitudinal studies, enabling researchers to track the evolution of customer behaviour in response to changing market dynamics.

The present study has made significant strides, yet it's important to acknowledge specific limitations that demand attention in future research endeavours. Firstly, the sample size in this study was relatively small compared to the vast EV market in India. To bolster the credibility of findings, future research should consider expanding the sample size. Additionally, there's potential to delve into disparities in customer satisfaction and loyalty levels between urban and rural locales, as well as conduct a comparative analysis before and after the acquisition of electric vehicles.

In conclusion, this research addresses a crucial void in the literature and furnishes actionable insights for industry stakeholders. Recognizing and rectifying service quality dimensions will be essential for attracting and retaining satisfied customers, thereby cultivating enduring brand loyalty amidst the burgeoning Indian EV market expansion.

References

Afroz R, Rahman A, Masud MM, Akhtar R, Duasa JB (2013) Malaysian perception and attitude towards electric vehicle. In: 2nd International conference on mechanical, automotive and aerospace engineering, p 5

Anderson, C. D., & Anderson, J. (2010). Electric and hybrid cars: A history. McFarland.

Antonides, G., & Hovestadt, L. (2021). Product attributes, evaluability, and consumer satisfaction. Sustainability, 13(22), 12393. https://doi.org/10.3390/su132212393

Anwar, S., Min, L., & Dastagir, G. (2019). Effect of Service Quality , Brand Image , Perceived Value on Customer Satisfaction and Loyalty in the Chinese Banking Industry. *International Journal of Business, Economics and Management Works*, 6(3), 24–30.

Aprilia, L., Maming, J., &Pakki, E. (2020). The Influence Of Trust And Service Quality On Loyalty Through Customer Satisfaction At State-Owned Banks In Makassar City.

Asadi, S., Nilashi, M., Samad, S., Abdullah, R., Mahmoud, M., Alkinani, M. H., &Yadegaridehkordi, E. (2021). Factors impacting consumers' intention toward adoption of electric vehicles in Malaysia. *Journal of Cleaner Production,* 282, 124474. https://doi.org/10.1016/j.jclepro.2020.124474

Axsen, J., Bailey, J., & Castro, M. Andrea. (2015). Preference and lifestyle heterogeneity among potential plug-in electric vehicle buyers. Energy Economics, 50, 190–201. https://doi.org/10.1016/j.eneco.2015.05.003

Bates, B. (1992). Electric vehicles—A decade of transition (SAE/PT-40). Society of Automotive Engineers.

Beerli, A., Martín, J. D., &Quintana, A. (2004). A model of customer loyalty in the retail banking market. *European Journal of Marketing,* 38(1/2), 253–275. https://doi.org/10.1108/03090560410511221

Bodet, G. (2008). Customer satisfaction and loyalty in service: Two concepts, four constructs, several relationships. *Journal of Retailing and Consumer Services,* 15(3), 156–162. https://doi.org/10.1016/j.jretconser.2007.11.004

Boztepe, A. (2016). Green marketing and its impact on consumer buying behavior. *European Journal of Economic and Political Studies,* 5(1), 5–21. http://www.ejeps.com/index.php/ejeps/article/download/83/83

Bunce, L., Harris, M., & Burgess, M. (2014). Charge up then charge out? Drivers' perceptions and experiences of electric vehicles in the UK. Transportation Research Part A, 59, 278–287. https://doi.org/10.1016/j.tra. 2013.12.001

Burton, J., & Khammash, M. (2010). Why do people read reviews posted on consumer-opinion portals? *Journal of Marketing Management*, 26(3–4), 230–255. https://doi.org/10.1080/02672570903566268

Byrne, B. M. (2013). Structural equation modeling with Lisrel, Prelis, and Simplis. https://doi.org/10.4324/9780203774762

Carley, S., Krause, R. M., Lane, B. W., & Graham, J. D. (2013). Intent to purchase plug-in electric vehicle: A survey of early impressions in large US cities. Transportation Research Part D: Transport and Environment, 18, 39–45. https://doi.org/10.1016/j.trd.2012.09.007

Caulfield, B., Farrell, S., & McMahon, B. J. (2010). Examining individuals preferences for hybrid electric and alternatively fuelled vehicles. Transport Policy, 17(6), 381–387. https://doi.org/10.1016/j.tranpol.2010.04.005

DeVellis, R. F., & Thorpe, C. T. (2021). Scale development: Theory and applications. Sage publications.

Dimyati, M. (2012). Model StrukturalPengaruh Product attributes TerhadapKepuasan dan Customer loyalty Produk Pond's. JurnalAplikasiManajemen, 10.

Electric Vehicle Market Size, Share Analysis, Value & Growth, 2030. (n.d.). https://www.fortunebusinessinsights.com/industry-reports/electric-vehicle-market-101678

India Brand Equity Foundation. (2024). Electric Vehicles market in India. Retrieved from https://www.ibef.org/blogs/electric-vehicles-market-in-india

Ellram, L. M., La Londe, B. J., & Webber, M. M. (1999). Retail logistics. *International Journal of Physical Distribution and Logistics Management*, 29(7/8), 477-494.

Eshghi, A., Haughton, D., & Topi, H. (2007). Determinants of customer loyalty in the wireless telecommunications industry. Telecommunications Policy, 31 (2), 93–106. https://doi.org/10.1016/j.telpol.2006.12.005

Farhadloo, M., R. A. Patterson, and E. Rolland. (2016). Modeling Customer Satisfaction from Unstructured Data Using a Bayesian Approach. Decision Support Systems 90: 1–11

Figenbaum, E., Kolbenstvedt, M., & Elvebakk, B. (2014). Electric vehicles - environmental, economic and practical aspects: as seen by current and potential users. TØI Report. https://trid.trb.org/view/1324341

Floh, A., Koller, M., & Zauner, A. (2013). Taking a deeper look at online reviews: The asymmetric effect of valence intensity on shopping behaviour. *Journal of Marketing Management,* 29(5–6), 646–670. https://doi.org/10.1080/0267257x.2013.776620

Fornell, C., Johnson, M. D., Anderson, E. W., Cha, J., & Bryant, B. E. (1996). The American Customer Satisfaction Index: Nature, Purpose, and Findings. *Journal of Marketing,* 60(4), 7–18. https://doi.org/10.1177/002224299606000403

Gadenne, D., Sharma, B., Kerr, D., & Smith, T. (2011). The influence of consumers' environmental beliefs and attitudes on energy saving behaviours. Energy Policy, 39(12), 7684–7694. https://doi.org/10.1016/j.enpol.2011.09.002

García, J.A.M. &Caro, L.M. (2009). Understanding customer loyalty through system dynamics: The case of a public sports service in Spain. Management Decision, 47(1),151-172.

Guo J., Wang X., Wu Y. (2020). Positive emotion bias: role of emotional content from online customer reviews in purchase decisions. J. Retail. Consum. Serv. 52:101891. doi: 10.1016/j.jretconser.2019.101891

Guo, Y., S. J. Barnes, and Q. Jia. (2017). Mining Meaning from Online Ratings and Reviews: Tourist Satisfaction Analysis Using Latent Dirichlet Allocation. Tourism Management 59: 467–483.

Gyimesi K, Viswanathan R (2011) The shift to electric vehicles— Putting consumers in the driver's seat. IBM Institute for Business Value

Haanpää, L. (2007). Consumers? green commitment: indication of a postmodern lifestyle? International Journal of Consumer Studies, 31(5), 478–486. https://doi.org/10.1111/j.1470-6431.2007.00598.x

Hackbarth A, Madlener R (2013) Consumer preferences for alternative fuel vehicles: a discrete choice analysis. Transp Res Part D Transp Environ 25:5–17. https://doi.org/10.1016/j.trd.2013.07.002

Hair, J. F. (2010). Multivariate data analysis. Prentice Hall. https://doi.org/10.1007/978-3-642-04898-2_395

Harun, R. A. (2015. Pengaruh Product attributes dan KualitasPelayananTerhadapKepuasan dan Customer loyalty Simpedes Pada BRI Unit Kantor Cabang Palu. Jurnal.Untad.Ac.Id, 3(10).

Hassan, M., Hassan, S., Nawaz, M. S., & Aksel, I. (2013). Measuring customer satisfaction and loyalty through service fairness, service quality and price fairness perception: an empirical study of Pakistan Mobile telecommunication sector. Science International, 25(4), 971-980.

Hidrue MK, Parsons GR, Kempton W, Gardner MP (2011) Willingness to pay for electric vehicles and their attributes. Resour Energy Econ 33:686–705. https://doi.org/10.1016/j.reseneeco.2011.02.002

Hill, N., Brierley, J. A., & Mac Dougall, R. (2017). How to measure customer satisfaction. In Routledge eBooks. https://doi.org/10.4324/9781315253107

Kandampully, J., &Suhartanto, D. (2003). The role of customer satisfaction and image in gaining customer loyalty in the hotel industry. Journal of Hospitality & Leisure Marketing, 10(1–2), 3–25. https://doi.org/10.1300/j150v10n01_02

Khare, A. (2015). Antecedents to green buying behaviour: a study on consumers in an emerging economy. Marketing Intelligence & Planning, 33(3), 309–329. https://doi.org/10.1108/mip-05-2014-0083

Kim, J., Jin, B., & Swinney, J. (2009). The role of etail quality, e-satisfaction and e-trust in online loyalty development process. Journal of Retailing and Consumer Services, 16(4), 239–247. https://doi.org/10.1016/j.jretconser.2008.11.019

Kline, R. B. (2005). Principles and practice of structural equation modeling (2nd ed.). New York: Guilford.

Kotler, P., Armstrong, G., Ang, S. H., Leong, S. M., Tan, C. T., and HoMing, O. (2012). Principles Of Marketing: An Asian Perspective. London: Pearson/Prentice-Hall

Krause, R. M., Carley, S. R., Lane, B. W., & Graham, J. D. (2013). Perception and reality: public knowledge of plug-in electric vehicles in 21 U.S. cities. Energy Policy, 63, 433–440. https://doi.org/10.1016/j.enpol. 2013.09.018

Kurani, K. S., Caperello, N., &TyreeHageman, J. (2016). New car buyers' valuation of zero-emission vehicles: California (UCD-ITS-RR-16-05). Institute of Transportation Studies, University of California, Davis. Retrieved August 23, 2019. https://escholarship.org/uc/item/28v320rq

Leninkumar, V. (2017). The Relationship between Customer Satisfaction and Customer Trust on Customer Loyalty. *The International Journal of Academic Research in Business and Social Sciences,* 7, 450-465.

Lin, H. H., & Wang, Y. (2006). An examination of the determinants of customer loyalty in mobile commerce contexts. *Information & Management,* 43(3), 271–282. https://doi.org/10.1016/j.im.2005.08.001

Martín Consuegra, D., Molina, A., & Talaya, Á. E. (2007). An integrated model of price, satisfaction and loyalty: an empirical analysis in the service sector. *Journal of Product & Brand Management*, 16(7), 459–468. https://doi.org/10.1108/10610420710834913

Matute, J., Bravo, R., & Pérez, J. M. P. (2010). The influence of corporate social responsibility and price fairness on customer behaviour: evidence from the financial sector. *Corporate Social Responsibility and Environmental Management*, 18(6), 317–331. https://doi.org/10.1002/csr.247

Menon, B. (2017) A study on consumer behaviour of passenger car segments through logistic regression modelling', *Metamorphosis,* Vol. 16, No. 1, pp.20–32.

Minta, Y. (2018). Link between satisfaction and customer loyalty in the insurance industry : Moderating effect of trust and commitment. *Journal of Marketing Management,* 6(2), 25–33. https://doi.org/10.15640/jmm.v6n2a3

Mohamed, M., Higgins, C. D., Ferguson, M., &Requia, W. J. (2018). The influence of vehicle body type in shaping behavioural intention to acquire electric vehicles: A multi-group structural equation approach. *Transportation Research Part A-policy and Practice,* 116, 54–72. https://doi.org/10.1016/j.tra.2018.05.011

Moisescu, O. I. (2018). From perceptual corporate sustainability to customer loyalty: a multi-sectorial investigation in a developing country. EkonomskaIstrazivanja-economic Research, 31(1), 55–72. https://doi.org/10.1080/1331677x.2017.1421998

Nalendra, A. R. A., (2018), The Effect of Service Quality, Price, Customer Satisfaction on Customer Loyalty (Case Study of IM3 Madiun Customers). *Journal of Computer Science and Technology.* Volume 3. No. 2.

Neaimeh, M., Salisbury, S., Hill, G., Blythe, P., Scoffield, D., &Francfort, J. (2017). Analysing the usage and evidencing the importance of fast chargers for the adoption of battery electric vehicles. *Energy Policy,* 108, 474–486. https://doi.org/10.1016/j.enpol.2017.06.033

Nugroho, N. A. (2015). PENGARUH ATRIBUT PRODUK TERHADAP KEPUASAN PELANGGAN DAN LOYALITAS PELANGGAN (Survei pada Counter Perdana di Gresik). *Journal AdministrasiBisnis*, 20(1). http://administrasibisnis.studentjournal.ub.ac.id/index.php/jab/article/download/821/1006

Onyeaso, G & Johnson, W (2006). Using co-integration methods to estimate the interconnectedness of intangible strategic assets: Empirical evidence for management decision making. *Management Decision,* 44 (9), 1231 – 1245

Pérez, A., Del Mar García De Los Salmones, M., & Bosque, I. (2013). The effect of corporate associations on consumer behaviour. *European Journal of Marketing,* 47(1/2), 218–238. https://doi.org/10.1108/03090561311285529

Potoglou, D., &Kanaroglou, P. (2007). Household demand and willingness to pay for clean vehicles. *Transportation Research Part D-transport and Environment,* 12(4), 264–274. https://doi.org/10.1016/j.trd.2007.03.001

Pournarakis, D. E., D. N. Sotiropoulos, and G. M. Giaglis. (2017). A Computational Model for Mining Consumer Perceptions in Social Media. Decision Support Systems 93: 98–110.

Rauyruen, P., & Miller, K. E. (2007). Relationship quality as a predictor of B2B customer loyalty. *Journal of Business Research,* 60(1), 21–31. https://doi.org/10.1016/j.jbusres.2005.11.006

Rezvani, Z., Jansson, J., & Bodin, J. (2015). Advances in consumer electric vehicle adoption research: A review and research agenda. Transportation Research Part D: *Transport and Environment,* 34, 122–136. https://doi.org/10.1016/j.trd.2014.10.010

Salah, K., & Kama, N. (2016). Unification requirements of electric vehicle charging infrastructure. *International Journal of Power Electronics and Drive Systems.* https://doi.org/10.11591/ijpeds.v7.i1.pp246-253

Shankar, V., Smith, A. K., & Rangaswamy, A. (2003). Customer satisfaction and loyalty in online and offline environments. *International Journal of Research in Marketing*, 20(2), 153–175. https://doi.org/10.1016/s0167-8116(03)00016-8

She, Z., Sun, Q., Ma, J., & Xie, B. (2017). What are the barriers to widespread adoption of battery electric vehicles? A survey of public perception in Tianjin China. *Transport Policy,* 56, 29–40. https://doi.org/10. 1016/j.tranpol.2017.03.001

Sierzchula, W., Bakker, S., Maat, K., & Van Wee, B. (2014). The influence of financial incentives and other socio-economic factors on electric vehicle adoption. *Energy Policy,* 68, 183–194. https://doi.org/10.1016/j.enpol.2014.01.043

Skippon, S., & Garwood, M. (2011). Responses to battery electric vehicles: UK consumer attitudes and attributions of symbolic meaning following direct experience to reduce psychological distance. Transportation Research Part D: Transport and Environment, 16(7), 525–531. https://doi.org/10. 1016/j.trd.2011.05.005

Srikanjanarak, S., Omar, A., & Ramayah, T. (2009). The conceptualisation and operational measurement of price fairness perception in mass service context. *Asian academy of management journal,* 14(2), 79-93.

Streukens, S., & De Ruyter, K. (2004). Reconsidering nonlinearity and asymmetry in customer satisfaction and loyalty models: an empirical study in three retail service settings. *Marketing Letters,* 15(2/3), 99–111. https://doi.org/10.1023/b:mark.0000047387.12609.23

Suhartanto, D., Chen, B. T., Mohi, Z., &Sosianika, A. (2018). Exploring loyalty to specialty foods among tourists and residents. *British Food Journal,* 120(5), 975-989. https://doi.org/10.1108/BFJ-09-2017-0485

Swan, J. E., & Combs, L. J. (1976). Product performance and consumer satisfaction: a new concept. *Journal of Marketing,* 40(2), 25. https://doi.org/10.2307/1251003

Tabachnick, B. G., Fidell, L. S., & Ullman, J. B. (2013). Using multivariate statistics (Vol. 6, pp. 497-516). Boston, MA: pearson.

Talantsev, A. (2017). Who gains and who loses in the shift to electric vehicles: impact assessment through multi-criteria multi-stakeholder analysis. , 37, 257–268. https://doi.org/10.1016/j.proenv.2017.03. 057

Tarus, D. K., &Rabach, N. (2013). Determinants of customer loyalty in Kenya: does corporate image play a moderating role? *The Tqm Journal*, 25(5), 473–491. https://doi.org/10.1108/tqm-11-2012-0102

Thungasal, Chandra.E.(2019). The Effect of Service Quality and Price on Customer Loyalty through Customer Satisfaction at Kasuari Hotel. *Journal of Business Management,* Management Study Program, Faculty of Economics Kristen Petra University, Vol 7, No 1.

Tirunillai, S., and G. J. Tellis. (2014). Mining Marketing Meaning from Online Chatter: Strategic Brand Analysis of big Data Using Latent Dirichlet Allocation. *Journal of Marketing Research,* 51 (4): 463–479

Trommer, S., Jarass, J., & Kolarova, V. (2015). Early adopters of electric vehicles in Germany unveiled. *World Electric Vehicle Journal,* 7(4), 722–732. https://doi.org/10.3390/wevj7040722

Vassileva, I., & Campillo, J. (2017). Adoption barriers for electric vehicles: Experiences from early adopters in Sweden. Energy, 120, 632–641. https://doi.org/10.1016/j.energy.2016.11.119

Vázquez-Carrasco, R., & Foxall, G. R. (2006). Positive vs. negative switching barriers: the influence of service consumers' need for variety. *Journal of Consumer Behaviour,* 5(4), 367–379. https://doi.org/10.1002/cb.187

Vidyanandan, K. V. (2018). Overview of electric and hybrid vehicles. Energy Scan, 3, 7-14.

Yadav, S. K., & Sahay, M. (2017). A STUDY ON AUTOMOBILE INDUSTRY GROWTH IN INDIA AND ITS IMPACT ON AIR POLLUTION. *Journal of Advanced Research in Dynamical and Control Systems,* 9,1901–1909. Retrieved from https://www.jardcs.org/backissues/abstract.php?archiveid=2849

Young, W., Hwang, K., McDonald, S., & Oates, C. (2010). Sustainable consumption: green consumer behaviour when purchasing products. *Sustainable Development,* 18(1), 20–31. https://doi.org/10.1002/sd.394

Yuen, K. F., Thai, V. V., & Wong, Y. D. (2016). Are customers willing to pay for corporate social responsibility? A study of individual-specific mediators. *Total Quality Management & Business Excellence,* 1–15. https://doi.org/10.1080/14783363.2016.1187992

Zhang Y, Yu Y, Zou B (2011) Analyzing public awareness and acceptance of alternative fuel vehicles in China: the case of EV. *Energy Policy* 39:7015–7024. https://doi.org/10.1016/j.enpol.2011.07.055