

An Empirical Study on KPI's for EV Car Business in Indian Market: Its Sustainable Challenges and Opportunities

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Abstract:

In recent years, electric vehicles (EVs) have gotten a lot of attention because they are important for reducing carbon emissions and improving air quality in cities. Even though more and more people are using electric vehicles (EVs), the EV sector is still having trouble growing because of problems like not having enough charging stations and high beginning expenses. The goal of this study is to find out what the most important things are for electric vehicle firms to do well, from the points of view of both customers and business owners. In this research article we are using the method of survey and observed the data by applying PLS-SEM. Thus the outcome resembles that each and every factors of technology, management relevance, econometrics, marketing sector and even the sales have a greater impact on the business performance from the customer's point of view. Technology is the most important component. On the other hand, the entrepreneur thought that environmental elements were not important, but technology, economics, and marketing were. The results of this study show how important it is for the electric vehicle business in India to focus on new technologies, good management, smart marketing, and being aware of the environment. It is thought that strategies that include these things will help businesses stay successful in a market that is always changing and competitive.

Keywords: Technical Adaptation, EV Business, Innovation Management and its Sustainability

Introduction:

Electric vehicles (EVs) have been a more popular issue in recent years since they are seen as a major way to reduce carbon emissions and improve air quality in cities. Data from around the world show that the count of EV on the roads is rising quickly as many countries switch from gas and diesel cars to EVs. To help this change happen, several governments have put in place laws and incentives such subsidies for buying electric cars, tax breaks, and building charging stations as said by (Jha & Singh, 2024; Z. Yan et al., 2023).

Even if more and more people are buying electric cars, there are still a number of problems that make it hard for the market to flourish. One of the main problems is that there aren't enough places to charge. Many areas still don't have enough charging stations, which makes it hard for EV users (Rockle & Schulz, 2021; Dipak & Ughade, 2021; Purnamasari et al., 2022). Also, the fact that electric cars cost more to buy than regular cars is another big problem (Li & Li, 2024). People still have different opinions on how well EVs work and how reliable they are, and some people are still skeptical (Madheshiya et al., 2024).

As per the innovative ideas in adoption by (Van Mierlo, 2024), the various components like compatibility, relevant advantage, complex in nature, trialability and observations affect how fast towards the societal concern with that of technological adaptation. When it comes to electric vehicles, relative advantages include lower fuel costs and benefits for the environment. Complexity, on the other hand, refers to how easy it is for consumers to understand and utilize the technicality (Insan et al., 2022). This theory of Value Network adds an important view point by imprinting for all the stakeholders involved in the ecosystem of EV (Rockle & Schulz, 2021; Dipak & Ughade, 2021). The policies that are created and imposed by the government are also acts a very important and crucial role for the purchase of EV as described in various environmental and economic nooks (Guzek et al., 2024).

To understand how the electric vehicle business may grow in a way that is good for the environment, it is important to look into what makes it successful. Identifying these elements, such as policies by the government, choice of customers, innovative technicalities and EV infrastructures supports and helps the stakeholders gear up with their speed in the purchase adoptions of EV (Wang et al., 2024 Madheshiya et al., 2024). Hence this research article directs to come out of the hazels and to improvise about the thinking capability of the customers towards EV (Li & Li, 2024).

So, the goal of this study is to find out what the most important criteria in view point of development of the EV company in India from the points of view of both business owners and customers. The paper is set up like this: Section 1 explains the issue and gives some background information on the growth of the electric car market and why research is important. In Section 2, we look at the literature on the success factors that were found. Part 3 talks about the approach, which includes the research design and the conceptual framework. In Section 4, we talk about the research outcomes and the statistical analyses. Sections 5 and 6 talk on the study's results, what they mean for managers, suggestions for how to grow the electric vehicle company, and ideas for more research in the future.

Review Literature:

Review towards the KPF in the EV industry

Majority of the companies who manufacture the EV are struggling with their profits. As the investments in the technology of EV car, which is the base for their innovation is becoming a hurdle as profits are constraint. As when we focus onto the NPV of an EV car plant, its normally break even or below it, which resembles the ROI of it is down in the longer run. Hence the investors are not that much keen in investing their money due to lower ROI. The EV car industry is not a proving sector and cherish in the future days as they are failing in making much expected ROI (Madheshiya et al., 2024; Wang et al., 2024).

Majority of the firms that make EV cars had trouble meeting the required and proper safety requirements that are required, which has made people less confident in them. Also, the shortage of charging facilities makes it harder for people in many areas to switch to electric cars. Recycling schemes for batteries that don't work well lead to more battery waste, which is bad for the environment. EV car manufacturing also emits a huge amount of pollution, which in turn develops a greater impact on the environment (Madheshiya et al., 2024; Wang et al., 2024). Electric vehicles are not widely accepted around the world because they do not meet safety and environmental regulations. Poor leadership at electric car companies makes it hard to make strategic decisions. In a fast-changing market, a company is less competitive if it doesn't come up with new items or ways to make them. Poor risk management makes the organization more open to changes in the market and technology (Insan et al., 2022; H. Yan et al., 2018). Not being so capable to withstand with the innovation and the facts of risk will eventually hurt the EV car business and its growth for the longer duration. When companies face market issues, their plans are less effective if their leadership, innovation, and risk management aren't up to par.

Electric car technology is still not fully developed, which makes them work poorly. Electric cars aren't as reliable for long-term use because their batteries don't last very long. Longer charging durations make it less convenient for users, which makes it harder for electric vehicles to be adopted (Dipak & Ughade, 2021; Purnamasari et al., 2022; Rockle & Schulz, 2021). Charging efficiency can't become better because there haven't been any new ideas in rapid and wireless charging methods. Low performance and durability of vehicles make customers unhappy, which makes it harder for the electric vehicle market to flourish.

The fact that not many people are buying electric cars shows that not many people are interested in this technology. Electric vehicles don't sell as well as regular cars, which shows how hard it is to compete in the automotive market. Government rules that aren't consistent or helpful make it even harder for the electric vehicle industry to flourish (Rockle & Schulz, 2021). Electric vehicle companies can't expand as much since they can't get more people to buy their cars or

increase their market share. Unless the support from the government for the purpose of infrastructural enhancement and the unleashed usage of the advanced EV technologies, the market can't be upgraded.

Immediate and breach decisions for the sales of the EV cars are sometimes not enticing to customers, which makes it hard to sell them. The fact that electric vehicles don't sell as well as regular cars shows how hard it is to get people to buy them. Electric vehicles aren't as popular because they cost so much (Dipak & Ughade, 2021; Rockle & Schulz, 2021). Consumers are less aware of and interested in electric automobiles because there aren't any good marketing methods. Low sales make it hard for businesses to grow and invest in electric vehicle technologies.

The high expenses of developing electric vehicles make it hard for new companies to enter the industry. The high cost of batteries makes electric vehicles more expensive to buy, which makes them less competitive. Electric cars are less appealing to buyers since they cost a lot to run (Vilcan et al., 2024). The companies are striving to reinstallation and more investment for their R&D and also the product development since they don't make enough money from selling electric vehicles. The electric vehicle business can't grow or stay in business because it can't cut expenses and boost sales.

This study is both significant and urgent since the problems that are holding back the expansion of the electric car business have not yet been fully solved. Even with different government policies and incentives, there are still big problems with charging infrastructure, technological progress, and people accepting electric cars. Battery technologies that are now in use still have problems with long lasting, their internal storage capability and also with time taken for full charging which in turn create inconvenience for the buyers. In adding to this, even the policies and strive towards the incentivisation make a mark up high in the basic price of the EV cars which is tough for a customer to buy at the down payment. The results of this study are very important since they may help solve these challenges by finding and studying the most important things that can help the electric vehicle industry succeed. By getting rid of these problems, we intend to make it easier for electric vehicles to grow in a way that is good for the environment and makes money.

The aim of this research article is to focus on the important and mere elements which determines the performance of the EV car industry likewise their financials, environmental concerns, leadership, technical innovations, sales and marketing with that of economic identities. This study also encompasses and recognises the key factors such as policies made by the government, customer satisfaction and preferences, handling costs and investment on it and the joint ventures with the EV car business ecosystem. This also focuses on the areas of success in their financials and trust gained by the customer with the availability and reliable charging infrastructures. By learning more about these things, it should be possible to come up with good ways to get more people to buy electric cars and help the electric vehicle industry grow in a way that is good for the environment.

Hypotheses:

Technical factors: Technology, durability, performance and charging time

EV car segment and their technological considerations which includes technicality, long lasting durable, measurable performance and time taken for the charging of the battery remains very important aspects. EV car innovation contains advance driving systems, latest batteries and high competent smart features which comforts the driving efficacy. Long last durable batteries represent that EV cars can be maintained for the longer run use, which even includes how far the batteries and other components will be last. The EV cars gives a measurable performance with high speed technology and its acceleration along high efficacy. The time taken for the full charging of the battery is also very important because that's the most important factor which will directly effect on the usage of EV cars by the users and they compare to their conventional regular vehicles (Madheshiya et al., 2024; Wang et al., 2024).

EV car manufacturers can get a competitive advantage above all their competitors as they are using the highest level of technology and thus getting the EV to be last longer. This will enact the confidence level of the buyer and thus result in maintaining of vehicles for longer duration. The measurable performance of the vehicle will delight the buyer and thus result in converting the present buyers towards EV cars. Even the lesser the time taken for the charging of the battery will make more convenient and delighted to the users. This makes a lot of favourism towards the usage of EV cars. Then the manufacturers can think about the greater ROI for their investment. The intent behind this research is to test some of the technological impacts which on the growth and longer success of the EV cars and its business which will also help the market to accept them widely (Wang et al., 2024).

H1: Technological factors have a positive impact on the success of the electric vehicle business in India.

Market factors: Electric vehicle adoption, electric vehicle market share, government policies

EV car manufacturing business has to give more importance on the minor issues like adoption, their market capture and policies implemented by the government. The adoption of EV shows the acceptance level and the usage of EV cars. This even is affected to the simple components like the awareness towards the environment, reduced usage costs and invention of newer technology. Market capture share shows the usage of the customers towards EV cars. Even the policies induced by the government like rules, incentives and subsidies supports the infrastructural development required for the buyers to switch towards EV segment. Hence they are the necessary requirements as they affect adoption of EV cars immediate and widen scope in the market to be succeeded in front of conventional vehicles (Guzek et al., 2024; Insan et al., 2022; H. Yan et al., 2018).

The adoption of EV cars and its market capture level makes a remarkable difference towards the EV car business as it indicates the interest and switch over to the EV automobiles. Even the manufacturers also show interest in producing more cars and invest further for the invention of newer technologies in enhancing their distribution network too. The government induced policies also supports the buyers in reduction of taxation, subsidies during purchase and infrastructural charges make it easy for the EV buyers (Guzek et al., 2024). Thus, it is very easy and to link the success of the EV cars with that of their components like adoption of EV, Market capture share and policies by the government. The main aim of this study is to test on the ideas of the market components have a greater impact on the growth of EV and its longitivity in the market trend and how it adoption will gear up and spike in the market capture share (Guzek et al., 2024; Insan et al., 2022; H. Yan et al., 2018)

H2: Market factors have a positive impact on the success of the electric vehicle business in India.

Sales factors: Selling price, sales share, unit price used

When we are discussing about the EV business, the components like selling price, share towards the sales and unit cost are very important aspects.

The cost of the new EV car is the amount that is meant for it. The share of sales by the EV cars are compared with the sales of the overall vehicles sold, which makes us easy to understand the acceptance level of the market. The price of the used cars is of worth for an EV which is already been used or owned. This in turn might affect the buyer to invest on EV cars. These things will become a significant as they might directly impact on the attractiveness and competitive edge of EV car industry (Rockle & Schulz, 2021).

The sales market capture, price of selling and the units sold remains as very important key success factors for the EV car industry. The reduction in the price of EV cars will attract the buyer and the huge sales market shares shows more eagerness in buying of EV cars and trust towards them. The rigid and stagnant pricing pattern can also build a lot of impression on the buyers in the longer duration which feels as worthy component for more number of people to switch towards EV cars. Rockle and Schulz (2021) represented the marketing dynamics which focus on the competitive advantage of the EV cars which will boost their market sales share. So this makes a meaningful success in the field of EV car industry which are more relied on their selling price, market sales share and unit cost. The main aim of this research is to test and observe the components have a greater impact on the successful growth and longitivity of the EV cars with their pricing and selling dynamics which boosts up the adoption of EV cars in the market (Rockle & Schulz, 2021).

H3: The sales factors have a positive impact on the success of the electric vehicle business in India.

Economic factors: Investment cost, battery cost, operating cost, revenue

The success of the electric car industry depends a lot on things like the cost of investments, batteries, operations, and sales. The costs of investment include all the money that needs to be spent up front to design, make, and sell electric cars. The cost of batteries is a big part of the cost structure of electric vehicles because battery technology is continually changing but is still rather expensive. Operating costs are the regular costs of keeping an electric car running, such as charging and maintenance. Revenue is the money made from selling electric cars and services that go along with them. These things are very important because they have a direct impact on how profitable and competitive the EV car business (Li & Li, 2024; Masruroh et al., 2024; Wu & Li, 2024).

The cost and selling dynamics based on the invest level, batteries, operations, and income are all very important for the success of the electric car industry. New manufacturers may not be able to entrant into the EV market because of high investment costs, and high battery costs can make electric vehicles less appealing to consumers by raising their prices. Low running expenses can give you an edge over your competitors and make more people want to switch to electric cars.

Stable and rising income means that you are doing a good job of getting and keeping clients. Vilcan et al. (2024) say that a good company model can lower expenses and raise income. So, it makes sense to think that the success of the electric car business will depend on the costs of investment, batteries, operations, and revenue. The aim of this research is to get and test an insight towards the economic factors might have a greater impact on the development and longevity of the EV car business as well as how the right economic strategies might enact the market position of EV cars (Li & Li, 2024; Vilcan et al., 2024; Wu & Li, 2024).

H4: Economic factors have a positive impact on the success of the electric vehicle business in India.

Environmental factors: Driving safety, charging stations, battery recycling

The environmental factorial considerations are very merely important to the EV car companies which include their safety while driving, infrastructural availing of charging stations and recycling of the batteries. ABS, control stableness and cruise control systems are the best examples for the enhancement in the terms of technology and thus result in making the driver as well as passengers more comfort and feel safer. This is a crucial element since it makes people more confident in electric cars, which can lead to more sales and use. Another important factor is having enough charge stations that are easy to get to. Limited charging infrastructure is often a big reason why people don't buy electric cars (Rockle & Schulz, 2021). Battery recycling is also very important for protecting the environment from battery waste, making sure that resources last, and lowering production costs in the long run (Purnamasari et al., 2022).

These three things are very crucial to the electric vehicle company. Electric vehicles can stand out from regular cars by being safer to drive, which can attract more customers. A strong and active infrastructural charging stations will make an easier and comfortable drive for the EV cars and to trust them at the greater extinct (Dipak & Ughade, 2021). The recycling of the EV batteries will reduce the impact on the environment as well as bring down the handling costs through the reusability of the necessary components (Vilcan et al., 2024). Hence it is very sensible to think and act for these components which have a huge impact on the EV car business. Thus the main aim of this research is to test and observe the recycling procedures of the EV battery, charging infrastructures and safer drive mode which have a greater impact on the growth and longevity of the EV car enterprises.

H5: Environmental factors have a positive impact on the success of the electric vehicle business in India.

Managerial factors: Leadership, innovation, risk mitigation

In the electric car company, leadership, innovation, and risk management are especially important managerial characteristics. Leadership is the ability of the people at the top of an organization to lead and motivate the rest of the staff toward a common goal. Innovation means coming up with new products, business processes, and technology that provide you an edge over your competitors. Finding, analyzing, and managing risks that could get in the way of reaching corporate goals is what risk mitigation is all about. These things are very important because they have a direct impact on how well a business can deal with changes in technology and the market (Hsun Yang & Chin Hung, 2022).

Some of the important and very necessary key success factors like leadership skills, innovative ideas and managerial risk taking capabilities leads towards the successful and growth of the EV cars business. Always the leadership qualities are focused on the vision building and also the longevity growth with the help of innovative ideas which enacts the newer technological development thus gearing up the usage of EV cars. It also helps in risk handling potentiality like technical and hazardless in the market. Innovative and newer products and businesses in the market can create a competitive edge over the lot many competitors and make to build the EV empire stronger and appealing to the buyers (Rockle & Schulz, 2021). Hence is it sort of sense to think about the better leadership, advanced technical ideas and managing the risk levels becomes the important and necessary key success factors in the EV car enterprises. The main aim of the study is to test and observe that the managerial implications have a greater impact on the growth and longevity of the EV business in the market of automobiles (Hsun Yang & Chin Hung, 2022).

H6: Managerial factors have a positive impact on electric vehicle business success in India.

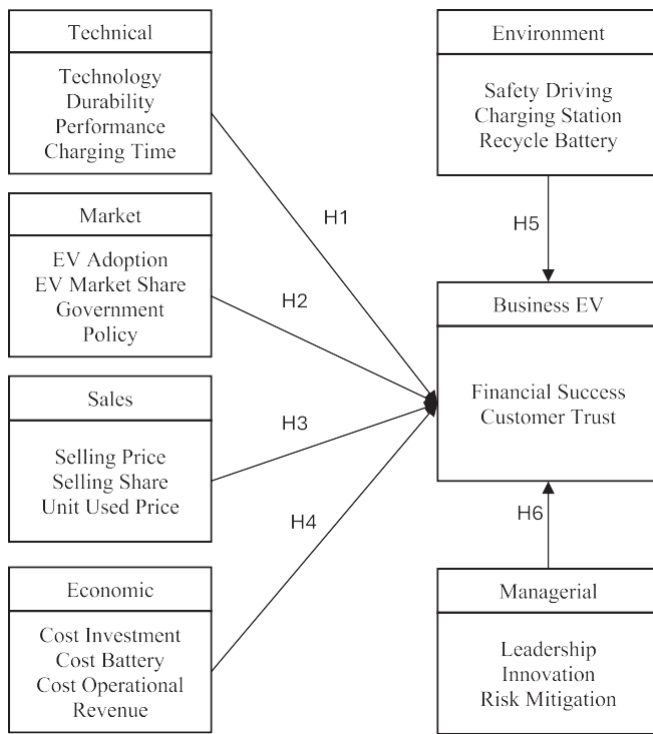


Fig 01: Conceptual Model Framework constructed

Research Methodology:

Design Framework:

The fig 1, represents the research article intent which is to link the support variables to that with critical key success variables of the EV car company. Here as mentioned in the diagram, we have six types of various factors that develops critical key success factors to the EV business such as Technical, Market related, Sales Point, Economic, Environmental concerns and finally with Managerial implications. We also can observe the link between each element that supports the EV company and make a successful contribution via correlation. The market relations, sales point aspect and economic factors have straight impact and effect on the values of financial success (KPI1). Similarly, consumer trust value is thus based on the environmental concern and managerial implications.

Data Collection:

As mentioned in the Fig 2, we have used a multi method strategy in this research article which brings the survey as the main methodology. We have also used PLS-SEM model to analyze and interpret the data. Later stage we have compared with the view point of EV business owners with the customers who are using EV cars. Likert scale method with five-point rating is induced because this is the most likely to be used methodology in the marketing and sales domain with psychometrics (Garland, 1991; Kulas & Stachowski, 2013; Ryan, 1980; W Raaijmakers et al., 2000).

Survey was done with questionnaire on random basis with 122 respondents for this research. And to ensure the survey results we have collected the data from the users only. These customers and the owners of the EV cars were only included as the part of our survey. We then implemented stratified sampling technique to compare the analysis between owners and staff with that of users and buyers. These sampling groups were framed during the survey. The PLS-SEM is been used for both the sampling groups. We have also used the gap analysis to analyse the various difference between the users and the owners of the EV cars and vehicles. This is done by comparing the two sampling groups statistically. As mentioned in the above para Likert scale was induced with “least important” for one rating and “most important” for the five rating.

Then finally the scores were analysed and interpreted to find out and extract the key elements for the success of the EV business.

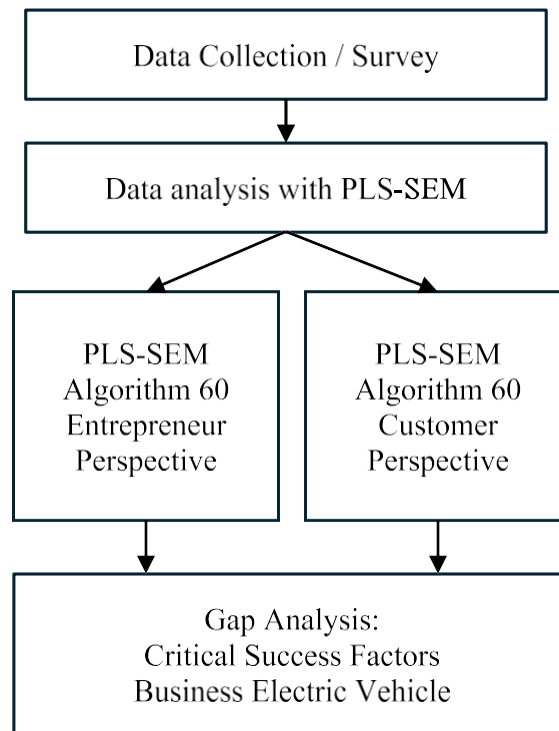


Fig 02: Research Methodology outline

Partial least squares structural equation modeling (PLS-SEM)

SEM is used further as a method for the structural analysis by some of the measurement models to check and observe the validation and reliability of those considerable models with measurement fit methods (Regehr et al., 2004). We often use this strategical method to observe and test the validation relationship model within the factors (Jain et al., 2017). This method is far better and improvised than the earlier regression methods for analysis as they find the connectivity between the constructive variables and their type indicators (Shah & Goldstein, 2006).

In this research study we used both confirmatory and exploratory analysis to formulate the latent constructive variables. This relates in generating the predictions and trying out with new adaptive theories which might elaborate in the future and also helpful in comparison with other EV companies. The PLS model/method is better option in this context of study as compared with regression and covariance modeling (Sugianto et al., 2024).

Even the descriptive analysis is uses to show the data collected as whole entity and it relies to figure out which data is likely to look after the skewness, kurtosis and also the variance inflations. In the present PLS-SEM model there exists the two steps to begin with the measurement model so as to properly check the goodness of fit, reliability and validity for the discriminants. Even Root Mean Square and Chi-square analysis is also done to figure out the fitness of good here. Hair et al. (2011) represents Root Mean Square values within 0.1 and Basow and Gaugler (2017) represents values within 0.08 are reliable and satisfactory fit. Cronbach's alpha, rho A and compositely reliable values are always quantifiable notations at internal consistency in the reliability. Even the Fornell-Larcker criteria along with HTMT is also used just to cross check the discriminant validation with factor loadings and AVE for convergent validation.

As per the data of Yousefi et al. (2016), a cronbach's alpha value is got by 0.6 which is reliable, but in actual required was 0.7. Here in studies also says that cronbach's alpha value ranging from 0.5 to 0.7 is reliable with consistency. And the value ranging within the value of 0.5 to 0.6 is also considered as appropriate. A rho A value of 0.7 is suggestable with the collaborative reliable threshold value of 0.7 is considered as moderate. The square root of AVE is considered as larger for all correlation values as determined at Fornell-Larcker criteria which analysing discriminant validation. HTMT meets to figure out the accuracy level of correlations within the variables that are driving the correlation indicators of various variables by an average compared with similar variables (Hair et al., 2011).

Here it is also mentioned that HTMT values should have an average threshold of around 0.9, and thus the values above 0.9 meant to be considered as not genuine and the threshold values of 1 are being acceptable. The structural models

quantify R-Square values to check how best the model can predict and f-Square values to check the strength of the model path and similarly the Q-Square values to analyse the accuracy of the model. The values derived from R-Square as 0.25, 0.5, and 0.75 represents the modest, moderate and high impacts (Hair et al., 2011). Whereas the Q-Square values over zero describes the derived value and prediction are relevant. Likewise, the F-Square values that are derived as 0.02 tells weaker association, 0.15 represents medium and 0.35 indicates as strong relationship (Hair et al., 2011). Thus the PLS-SEM analysis done in this research has used the factor loading of 0.7 to get precise outcomes. We did PLS-SEM to analyse the effect on the EV business. As enumerated in the Fig 2, the model of high performance framework made it clear with getting away from the elements which are not at all related with the factors.

Results and Outcomes:

Demographics of respondents

This research takes care of what makes an EV car business to be successful in the view point of both the investor and users. The final sample had 122 people that answered, based on the demographic data that was obtained. There were 70 men (57%) and 52 women (43%) in this group, which gave a balanced assessment of how both genders feel about and use electric automobiles. Most of the people who cleared the questionnaire have half decade of the experience which indicates that they are known enough and capable in understanding the context and are involved in the EV industry.

Out of overall respondents around 65% are two wheeler users, 30% are blend of two & four wheeler users and finally one 5% mentioned are with four wheelers. So we can quantify that EV business has widen market for two wheelers, which is necessary to understand in the process of developing EV business and their plans. The data collected from respondents who dwell from various cities like Bangalore (44% or 54 respondents), Mysore (20% or 24 respondents) and Mangalore (17% or 21 respondents).

When it comes to the view point of Job, around 52% of the respondents are the employees of EV car companies, 32% are from private based companies, 12% from the student's community and the remaining are the civilian workers and entrepreneurs. So it represents the direct employees of the EV enterprises are the major respondents and then have deeply enrooted into this business works and the problems involved in it.

Descriptive statistic

This research has important two key factors when it comes to the view point of success for the EV business: the investor and the user. This analysis takes care of two models in the view point: The actual and the Expected Model, which are observed from the analysis done.

For both the versions the values for SRMR remains the same for the investors point of view as 0.088. If in case lesser than 0.08, the model would have been fit accurately. Chi-Square values for both model tends to be 4.577, which depicts there is high level of variation and difference between the actual and expected data and results in best model fit.

As per the view point of investors level, the SRMR models shows the value of 0.1638, which is higher than the cutoff value of 0.08 results in non-suitable for the model fit. This results says that there is discrepancy within the actual and estimated data. Hence, it suggests to have more number of variables for the model to fit it with accuracy. Even the value obtained by Chi-Square is infinite which resembles not fit to estimate the data and need more work.

This research study demonstrates that the created or developed model for the view point of customer fits accurately inline than compared with the model of investors. As the variation and high value for the investors model shows that the impact on the performance of EV car business. Just to get the more accuracy in the outcome from the investor's view point it is necessary to change the model by introducing more number of variables and also can use different analysis pattern.

Measurement model

The value obtained by R-Square depicts that the developed model is reliable in describing that the EV car business have better option than other vehicles from the view point of customers. With the obtained value of 0.99987 and an expected value of 0.99985, this seems to be the variables in the mentioned model functions well and lead towards a bit precise way. Higher analysis for the test of reliability and validation is also done with the results. The model constructed for this test of convergent validity as their factor loadings found to be higher in side than 1 and their average extracted value to be higher than 0.5. This resembles that the model is accurately can indicate the concepts wanted to be. In this test the achieve Cronbach's alpha and reliability values obtained are 0.7 which are stable and consistent.

The investors view point observes this model as very good in explaining the variations in the success of EV car business, since it's not so prominent from the customer's view point. The value obtained by R-Square and the adjusted value are 0.9810 and 0.9790 respectively, which shows that the EV car business have strong difference in their success rate. The analysis done on the reliability and validity has given a very good back up results in the way of consumer perspective. Here it resembles that the still more higher accuracy of the work need to be done to make sure that the discriminant validity at its best level.

In addition to this, generally if we observe on the R-Square results with that of reliability and validity data which resembles the model to be quantified on the success rate of EV car business from both customers as well as investors view point. The model from the view point of customers fits virtually in the accurate way but whereas the model from the investors view point fits a less well. Considering both the viewpoints in terms of technologically it depicts a major role in the performance of the companies that are backed up by the values obtained by validity and reliability tests. Thus the outcome gives a better insight mostly at the aspects which affect the success of the EV car business in India. Hence this result might support the car manufacturers as well as policy setters.

Hypotheses testing and comparative gap analysis

This research focuses on the components that affect how best the EV car companies performs well from the view point of investors as well as customers. From the view point of the customers, all the hypotheses are well accepted and observed with high coefficients. The economic factors have obtained the value with 0.213, with the environmental concerns has 0.171, the managerial implications have its own value of 0.171, the marketing aspect with 0.151, sales with 0.174 and the technological factor with 0.219. Hence all the T and P obtained values shows high support in terms of performance level which is a huge impact on how best the EV car business does in the Indian market.

On the another aspect from the investors view point, the environmental concern doesn't support in this context on the success rate of EV car business as it shows the coefficient of 0.083 and a P value depicted as 0.144. Hence this represents the hypothesis not holds good. Later with the economic factor has a value of 0.228, management factor with 0.208, marketing with 0.143 and finally the technical with 0.290. Here all the T & P values are merely significant. This represents the investors think all these factors are more important and reliable during the decision taken about the EV car business. And the variation in the two viewpoints indicates the difference of opinion on the success rate of the EV car Business. We also can analyse that the customers have greater concern on the environment and sales aspects., while the investors have more curiosity on economic, marketing and technological terms. Finally, the EV car business can be improvised from both the view point of concerns m which in turn help the manufactures to do their best in the competitive market.

Comparative gap analysis with previous framework

(Moro et al., 2023) talks on the things that make electric vehicle firms successful, but from a different point of view. The research underscores the importance of designing a Product-Service System (PSS) business model for electric vehicle sharing in Brazil, with sustainability in mind. The results show that moving to a PSS model is difficult but has a lot of promise to make both the economy and the environment more sustainable. The paper also talks about how important it is to cooperate with different groups to build a sustainable value network and how adding digital elements might help the PSS business model work better (Appendix G).

On the other hand, this study looks at the success elements of the electric car company from the points of view of customers and entrepreneurs in India (Fig. 3). This study used descriptive statistical analysis and estimating models to show that technological elements are the most important aspects that affect business success from both points of view. Customers care full of concern usual environmental factors, whereas businesspeople are less concerned. The model used for the customer viewpoint also fits better than the one used for the entrepreneur perspective. The latter needs to be changed or have more variables added to it to make it fit better.

Findings and discussion

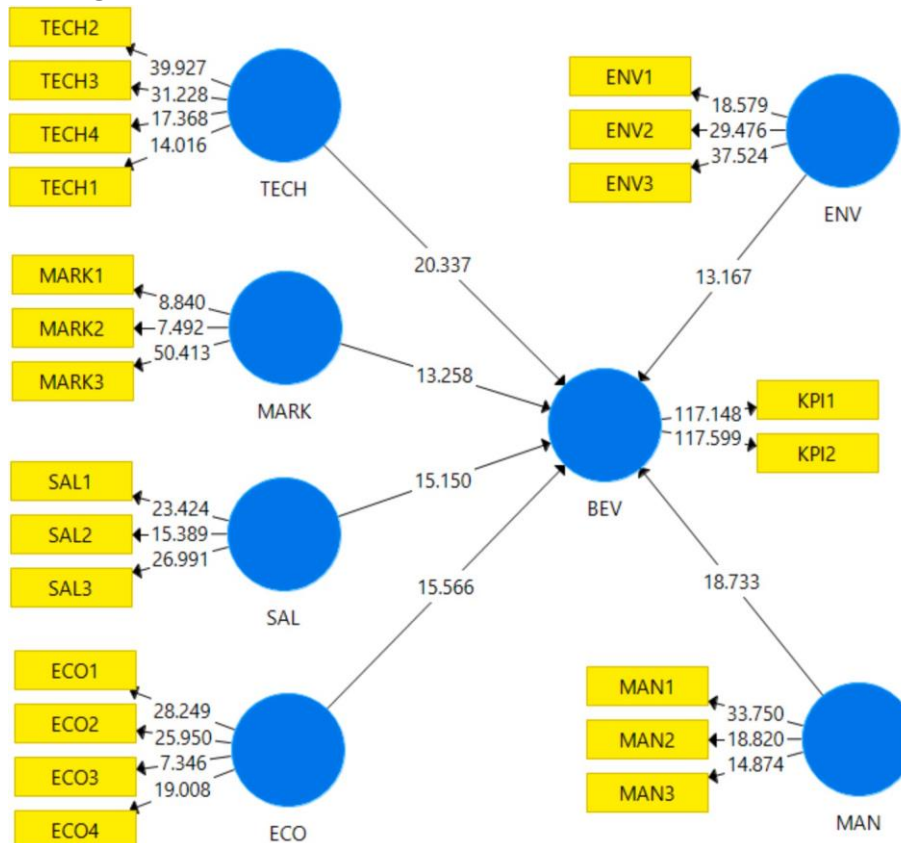


Fig 03: Pathway from the view point of customer's perspective

This study looked at the diverse points of view of customers and business owners in India when it came to figuring out what makes the electric vehicle sector successful. The results demonstrate that the two groups have different ideas about what variables are most important for the success of the electric vehicle business in India. From the customer's point of view, all of the aspects looked at have a big effect on the success of the electric vehicle business. Customers think that technological, managerial, economic, environmental, marketing, and sales elements are all significant. According to (H. Yan et al., 2018), technological variables have the most impact. These characteristics are very important since they have a direct impact on how profitable and competitive the automobile business is. This shows that buyers demand a lot from new technology and good management in the electric vehicle business. They also stress how important it is to think about how your actions will affect the environment and to have good marketing and sales plans.

On the other hand, from the entrepreneur's point of view, there is a big difference in how environmental elements are judged, as they are not seen as important for economic success. This point of view is not in line with what Rockle and Schulz (2021) say, which is that a lack of charging stations is often a big reason why people don't transition to electric vehicles. Business owners care more about things like the economy, marketing, management, sales, and especially technology. technology aspects once again came out on top, showing that entrepreneurs are focused on new ideas and technology progress to help their company grow. Entrepreneurs also put a lot of weight on economic and marketing considerations, which shows that they are more interested in money and ways to boost sales and market share.

One fascinating thing that came out of this study is that customers and business owners have quite different ideas about how environmental conditions affect their businesses. Customers care more about environmental issues, which may be a sign that more people are becoming aware of sustainability challenges. Entrepreneurs, on the other hand, seem to be more practical and focus more on things that directly affect the growth and profitability of their businesses, such technology, economics, and marketing. Both sides agree that technology is very important for success, but entrepreneurs put more weight on new technology than customers do. This means that both groups agree that technology is vital, but entrepreneurs may see it as a key way to get ahead of the competition and stand out in the market.

In general, this study shows that a good business plan for the electric car industry should involve a focus on new technologies, good management, smart marketing, and being cognizant of environmental issues. Entrepreneurs are only interested in things that will make them money right now, but customers want a more complete strategy that includes protecting the environment. By taking into account these distinct points of view, you may come up with business plans

that are more complete and meet the demands and expectations of both groups. Based on these results, electric car companies in India can come up with more focused plans that include new technology, good management, environmental consciousness, and smart marketing to do well in a competitive market over the long run.

Conclusion

This study shows that India needs a strategic approach to the EV sector that includes new technologies, good management, marketing, and environmental consciousness. A full plan that takes into account both the customer and the business owner's points of view can guarantee long-term success in a market where there is a lot of competition.

Managerial implications

This study gives Indian EV firms useful information that they can use. To match client expectations, businesses need to focus on new technologies and spend money on research and development. It is important to have good management techniques that make the most use of resources and boost production. In addition, firms should use data-driven, proactive marketing strategies that make use of digital platforms and connect with customers through both online and physical channels. Even though entrepreneurs don't care as much about the environment, they need to use eco-friendly strategies to meet customers' strong interest in sustainability.

To keep customers coming back, it's also important to improve sales and customer service and to adjust to changing economic situations. Companies will be able to stay adaptable in a market that is always changing if they offer competitive prices and flexible financing choices.

Limitations and future research

The study only looks at large cities in India, so it may miss differences in how customers and entrepreneurs think in different parts of the country. In the future, studies should cover a wider area, including rural areas and small towns. A mixed-methods approach could also provide us more information by combining numbers with interviews or focus groups to look at underlying reasons and problems. Future research might also look at how industry cooperation, government policy, and building new infrastructure can help the EV sector expand.

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