

**Title**

Foresight, Organization Policies and Management Strategies in Electric Vehicle Technology Advances at Tesla

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## **Abstract**

The purpose of this case study is to highlight and explain Tesla's management strategies, organizational policies and foresight approaches for implementing a pragmatic strategy for the future mass production of electric vehicles (EVs) at affordable prices. Due to changing technology, uncertainty and increasing global instability in business operations; and the alarming emission of carbon dioxide (CO<sub>2</sub>) into the atmosphere as a result of fossil fuel burning, which is responsible for the cause of climate change, greenhouse effect and global warming. Management at Tesla have developed an ambitious plan and strategy in respond to these challenges through long range battery technology that will enable production of high volume and low cost electric cars with no fumes, noise or dirt to millions.

**Key words:** Foresight, Organization Policies, Management Strategies, Electric Vehicle technology, Tesla

## **Learning Outcomes**

- To explain how Tesla uses the foresight approach to respond to future changes in electric vehicle technology
- To describe how Tesla's technological policies are helping to sustain its future development.
- To evaluate management strategies and its impact on technological advancement in the electric vehicle technology

## **Introduction**

This case study uses the foresight approach to discuss the rapid advancement and changing trends in the electric vehicle technology at Tesla. According to Andersen and Rasmussen (2014: 4) foresight is a method that links the future in a 'qualified and active way' to strategically plan for organizations future' in a sustainable manner. Due to uncertainty and increasing global instability in businesses and changing technology, the foresight approach has become one of the most sustainable strategic options for planning and establishing long-term visions and strategies by businesses and government institutions. Foresight approaches are important in building how organizations' develop their capabilities and plan for the future in a strategic and sustainable function. Not only does it enable a range of strategic options in the future but also enhance the understanding of the challenges and risk that may occur. There are many studies that have examined the use of foresight methodologies to shape future thinking, however, evidence available shows that there are limited research report that have critically analyze and evaluate how organizations' policies and management strategies have been integrated to ensure future leadership and sustainability. That is why this case study is important and timely. The foresight approach will be used to critically analyze and evaluate Tesla's management strategies and policies in the future development of electric vehicles.

Tesla Inc. is a US electric car manufacturer, founded in 2003. It is one of the first electric vehicle manufacturers in the world. Tesla released its first electric vehicle in 2008, a two-seater sports car called Roadster. It was the first car powered by lithium-ion batteries. It travelled over 200 miles and it made the world distance record of 311 miles. In 2012 Tesla released Model S, a seven-seater electric vehicle adored by most Americans. A survey carried out in 2014 revealed that the Model S was the most loved vehicle by Americans, this was nicely put by Morgan Stanley as "the world's most important car company," (Baer, 2014). Tesla employs over 30,000 employees, including more than 25,000 employees in the US.

One of the major challenges facing the world today is climate change as a result of greenhouse effect and atmospheric pollution from burning of fossil fuels. Vehicles that use gasoline from fossil fuel produce carbon compounds such as CO<sub>2</sub> and other toxic emissions into the atmosphere leaving humanity vulnerable to things like pollution and greenhouse gases. It is observed that the concentration of CO<sub>2</sub> in the atmosphere has been increasing exponentially and it is believed to be over 400 parts per million. The alarming increase of CO<sub>2</sub> brought about by increase burning of fossil fuels is now considered to be the cause of increasing climate change and rising global warming (Thompson, 2016).. To control environmental pollutions as a result of these CO<sub>2</sub> emissions, Tesla, one of American's automotive maker and solar panel manufacturer is leading the revolution in the auto industry to produce more efficient and cleaner energy sources to power future vehicles.

### **The Role of Foresight and Insight into the Development of Electric Vehicle**

The increasing demand for fossil fuels and energy consumption due to increase in global population, the general environmental degradation and climate change have all added to the search of a sustainable way to produce energy for the automotive industry. In the automotive industry, product innovation in design and manufacturing that will rely on less fossil fuel is attracting more attention. Electric vehicles, whether pure electric or hybrid (EV/HEVs), that were hitherto a thing for the rich are now becoming a reality and commercially available and have been gaining acceptance not only among environmentally conscious individuals, but among mainstream consumers. Tesla Motors foresight to differentiate itself by solely manufacturing electric vehicles to compete with gasoline vehicles has come a long way through management strategies and vision.

As Tesla attempts to engineer and ensure they are competitive in the automotive industry, the organization employed forecasting and environmental scanning techniques in their planning, which made them to identify that the global electric vehicle market size in 2012 was worth 83.5 billion U.S. dollars, however, this is expected to grow at a compound annual growth rate of about 19 percent and this a market that they will want a piece of the cake (Statista 2018). For Tesla to meet future demands for

technology advancement in the automobile industry, the management have developed long-term policies and strategies to meet future demands for electric vehicles in the form of improve technology to produce lithium batteries for EVs in large quantities. To do this, Tesla has made her patent open to the public to attract individuals and organizations with expertise in the electric car industry to enable them tap into the future electric market. Thus, this has led to the building of Gigafactories that will produces large scale lithium batteries to generate economies of scales to power electric vehicles. The first Gigafactory is expected to be functional in 2017 and aims to produce more batteries to power 500,000 EVs by 2020. It is hoped that this future foresight will help to lower the price of lithium batteries by 30 % and eventual lead to lower prices of the Model 3. In addition, Elon Musk recruited experienced and well qualified personnel in the person of Jeffrey Brian Straubel, an international engineering designer to be in charge of the technical direction of the organization and Deepak Ahuja who brings more than 20 years of global automotive financial experience to the Tesla team. This is a strategy to meet the future employee requirements if the organization is to succeed (Tesla 2018).

Tesla's is leading the revolution of the manufacture of EV. Its business plan is to revolutionize the automotive car industry through the battery technology to bring electric motoring to the masses. They have a vision of the world without gasoline vehicles. Tesla's foresight approach is based on the disruptive product innovation model, which seeks to trigger electric transport revolution that will consigned gasoline cars to history and kill off the combusting engine. The disruptive innovation approach is an approach that creates a new market and value network which eventually kills off an existing technology, market or network value by displacing existing and established products and market leads in organizations (Assink 2006).

The model S, one of Tesla's flagship electric cars is to lead the revolution, it is expected to be developed to travel 480 km on a single charge. The Model S is just the beginning. Such a revolutionary vehicle demands an extraordinary factory to create the state of the art facility from scratch. To do this, they employed the best talent in the industry in the person of Gilbert Passin-vice president of manufacturing, a former employee of Toyota's plant in Canada. This led to the birth of a mega factory like no other, known as the Giga factory. This brought a total fresh approach to car manufacturing. The wall

and floors of the factory are painted white, the machinery are red in color, skylight and windows flood the factory with sun light. Bicycles are provided as a means of transport for workers to move around the factory. The floor space of the factory is filled with the most advanced technologies, automatic production lines capable of building thousands of cars in a day, super-efficient multi-tasking robots, self-guided smart cars and computerize schedulers. Since the inception of the organization in 2003, they have been pursuing their electric vehicle revolution with a step by step strategy. In an unconventional move Elon Musk- the CEO said they must invest in their reputation first and worry about profit later. The strategy is in two phases.

Stage one of the strategy is to make small number of high value cars that will prove that electric powered cars can be desirable, fast and long range.

Stage two of the future foresight plan is to produce cars that cost half as much and sells in much bigger numbers. This led to the birth of the Model-S, to maximize battery range and efficiency. To increase the battery range for the future EVs, Tesla adopted stumping strategy, which means 97 % of Model-S was built with light aluminum plates, a rare and extreme feature in mass car production. Thirdly, the strategy was adopt the power train manufacture approach-This is where they build the heart of the Model-S, motors and battery parts. This ensures high performance and long power range through advanced motor technology, a secret only available to the organization. The next stage of the strategy is to produce high volume and low cost electric cars in millions in the near future with no dirt, fumes, noise and quiet street.

### **Description of Organizational Success**

This section presents the success achieved by Tesla as result of adopting the flexibility model that is helping the organization to leverage its capabilities in the niche electric car market. The importance of adopting flexibility approach in its operation cannot be overstated. Tesla has shown some good level of flexibility which is consistent to its foresight and long-term vision to dominate the automotive industry with the production of cheap electric cars. This was demonstrated through a coupled of innovation which has ensured the development of cooperation with supplemental partners and the formulation of joint ventures and alliances.

Tesla has remained focused and on track on its foresight because of the access it has to complement technology through inter-organizational collaboration (Ebersberger et al. 2010; Mazzola et al. 2012). Research by Lecocq and Looy (2009) revealed that companies that achieve better innovation performance tend to have a broad research and development alliances. Tesla's partnership with Panasonic is a testament to this finding. In the words of the Co-Founder and CEO Elon Musk the partnership "is a powerful endorsement of our technology that Panasonic, the world's leading battery cell manufacturer, has chosen to partner with Tesla to advance electric vehicle performance and value". He was convinced that "Incorporating Panasonic's next-generation cells into Model S batteries will ensure unrivaled range and performance. We are very grateful for our great partnership with Panasonic" (Tesla Motors, 2011). Though cooperation and alliances have been critical factors to Tesla's successes, notwithstanding, it is also important to emphasize that these require a high level of flexibility from the parties involved which is why Tesla can be argued to be flexible and open to different strategies and ideas towards fulfilling its vision hence reason why it's being regarded as one of the successful businesses in the world.

Since 2008 when the Roadster model was launched, Tesla has created many other high performance electric vehicles which has positioned the company as one of the giants in the electric car manufacturing industry (Sharma 2016). The exceptional technology, incredible aesthetics and high performance standards of the Tesla cars have helped the company to achieve a 5-star rating in safety from the US National Traffic Safety Administration. After selling more than 50,000 of the Model S in 2012, Tesla introduced Model X the cross over version which had more than 100,000 sales in 2015 (Andrews and Johansen 2013). Model 3 which is a cheaper version of the earlier two models was introduced in 2017 for the mass market which has been doing very well (Clausen et al. 2012; Andrews and Johansen 2013).

Aside of Tesla's flexibility, one other factor that describes the organization's success is its unique capabilities and competitiveness. The distinction between Tesla and the other brands and the reasons why it is growing rapidly in terms of market share is because of their excellent customer service model which focusses on "innovative service plan,

supercharger stations, and battery swap features” (CSR Hub 2016). Hence Tesla is well placed as both an innovative technology and service company. Chen and Perez (2015) argued that the company is expanding across the world and aims to produce more lithium ion cells in 2020 which would be more than the total world output in 2013 using the battery plant called the ‘Giga Factory’. The fact that Tesla was adjudged number one in the ‘World’s Most Innovative Companies List’ by Forbes 2015 innovate proves that the brand is successful (Dyer & Bryce 2015). Evidence from Dyer & Bryce (2015) suggested that Elon Musk, the company’s founder envisions Tesla as a leading technology and design company which strives to help provide sustainable energy to the world. The customer service model at Tesla was underpinned by Mendelow matrix which helps to categorised customers and other stakeholders in order of power and interest they have in the company and the services it offers. This has enhanced Teslas’s strategy as the dynamic needs of their customers are identified and addressed always (Dyer & Bryce 2015).

Furthermore, innovation is one of the core competences of Tesla which has made it gain competitive advantage over its rivals. Tesla’s motors bold innovation has resulted in the creation of new products, new processes and new markets making it one of the leaders in electric car manufacturing globally (Miller & Olleros 2007). Francis & Bessant (2005) and Miller & Olleros (2007) submitted that Tesla is among very few companies that design and deliver cars in the current market that possess long driving range, sportive performance and classic designs. This capability is anchored by strong research and development and combination of employee’s ideas. The fact that every employee is made part of the decision-making process of designs and car models ensures that everyone dream, remain passionate and deliver consistent to the foresight of the company. Again, the open innovation approach used by Tesla enables the company to combine multiple know-hows derived from employees, research and other companies to design innovative vehicles. Therefore, the use of innovative technologies at tesla can be argued to be one of the core capabilities for the company that has set them apart from their competitors currently and in the future if it is continued. These successes discussed above, and the vision of the company has helped shaped the organizational Policy and management strategies to sustain the gains made.



Tesla flexibility in partnering other organizations to achieve her dreams is anchored in their supplier policy which expects all their collaborators and affiliates to conduct their operations in a manner that adheres to their supplier policy and principles. Tesla ensure they work collaboratively with their partners and suppliers to encourage compliance with the following principles:

- Discipline employees or contractors, including potential termination of contract, who fail to meet Tesla's Human Rights and Conflict Minerals Policy;
- Transition away from dealing with any partner or supplier that is believed to be engaged in activities that does not adhere to the organization's ethos.
- Carry out independent third-party audit of supply chain due diligence at identified points in the supply chain

### **Management Strategies to Sustain Success**

One of the strategies that have positioned Tesla is the drive for “continues innovation” which is also one of its capabilities (Collis & Rukstad 2008). There has been consistency in leadership commitment to innovation and strategic collaboration (Crittenden & Crittenden 2008). This is demonstrated at all levels of leadership in the organization, where top management are involved in team activities and they facilitate training and development of hard working employee for new leadership and management roles. Thus, supporting team efforts by drawing from different expertise in the automotive, electronics and in the field of software. This is evidenced in the tweet made by Elon Musk that read ‘So much blood, sweat and tears from the Tesla team went into creating cars that you’d truly love. I hope you do’ (CNBC 2018).

Tesla’s leadership commitment promotes an organizational culture that creates human resource centered and competence needed for innovation. The organizational culture empowers employees to use their initiatives to search for new ideas that make the business to stand apart from other competitors in the automotive industry. For example, through Tesla’s organizational culture, human resource capabilities are maintained and they function as a channel by adding to the strategic effectiveness and success of the business (Meyer 2018).

Furthermore, the unparalleled innovation shown over the years have helped Tesla to focus on global expansion and gradual shift from their initial ‘High Price Low Volume’ to ‘Low Price High Volume’ (Gao et al. 2016). Equally, the open Patent move strategy adopted has consolidated the gains of the company and has positioned it as a pioneer for a sustainable tomorrow. Their “supercharger stations” which allows car owners to plug in for free and ride for another 270km with just 30 minutes of charging has made the brand very attractive (Holmberg 2011). Battery swap strategy implemented by Tesla has inspired many customers to buy their cars as the burden of paying for new batteries in the coming years have been taken care of through the automated battery swapping stations (Halla 2015). This has not only enhanced their competitive advantage but has also open alliance and external collaborations for better innovation. Another key strategy that is sustaining the growth of the company is the architectural features of their batteries which makes it very difficult to imitate (Gao et al 2016).

Again, another strategy that has played critical role at Tesla is the design of vehicles built on broad differentiation, an adaptation from the Porter’s five forces model (Dess & Davis 1984 and Tesla 2016). The design of vehicles that differentiates Tesla from the other firms in the automobile industry has proven to be a success (Dess & Davis 1984 and Tesla 2016). The use of integrated environmentally friendly technology coupled with the unconventional way their vehicle is put together is seen as unparalleled in the industry (Gao et al. 2016 and Tesla 2016). This new architecture ensures cars are built from clean slate which is regarded to be difficult to replicate by most established automobiles (Chen and Perez (2015). This has set Tesla apart as a brand and positioned it competitively globally.

The recent substantial pivot strategy adopted further consolidates the initial gains “architecture formula” achieved by incorporating clean energy plans in its manufacturing process (Halla 2015). It is yet another step that distinguishes Tesla from the rest of the car manufacturers in the world.

Moreover, as part of the measures to ensure intensive growth, Tesla Motors uses market penetration as a tool to increase its sales revenue and profit. This is achieved by the use of aggressive marketing in its current market (United States) through the use of customer engagement and forums to discuss, review and evaluate the vehicles produced at Tesla. Customers are made to appreciate through this medium the benefits of having a Tesla vehicle as compared to other brands. Evidence suggests that this approach is viable in

aiding the growth of the company currently and in the future. In addition to this, effort is been made to enter new markets in an attempt to generate more sales and grow the business. New offices and facilities are being built across the globe to ensure that Tesla remain on course to achieve its vision of a global company. Tesla has an advantage to achieve dominance in the industry due to these strategies discussed. This is because, Tesla's brand is growing, and the leadership foresight has positioned the company in a more sustainable path in the electric car industry.

## **Conclusion**

In conclusion, Tesla's foresight plan and strategy in the electric vehicle market is hinge on the visionary management team and innovative employees. The team is guided by the organisation's long term strategies and policies to revolutionize the automotive industry to produce sustainable energy to power all vehicles in the near future on cheap, clean and noise free technology, thus, consigning gasoline vehicles to history. To achieve their long term strategies, not only did the organisation assembled the best talents in the industry, in the persons of Deepak Ahuja-Chief Financial officer, an engineer who transited into finance. Ahuja was formally with Ford in charge of small car development. J B. Straubel-The Chief technical officer (CTO) a co-founder of Tesla, who played key roles in the company's technical and production department. Gilbert Passin-vice president of manufacturing, a former employee of Toyota's plant in Canada, now in charge of the new Giga factory outside of Sparks, Nevada. Tesla's future plan is to accelerate the transition to sustainable energy through low cost and affordable electric vehicles, to do this the company plan to produce 500,000 cars per year by 2018 (Tesla 2017). Also, the company has form strategic partnerships with third party organizations such as Panasonic for the development and manufacture of lithium batteries. It is hoped that by 2018, Tesla will produce autonomous cars (Thompson, 2016).

Another future growth strategy is to modify the existing assembly plant to handle mass production of low cost and long range cars for millions. This will involve advanced development of intelligent robotic computers, expansion of the supercharging network

which will offer free electric filling stations that are capable of charging vehicles within 30 minutes and travel for 480 Km.

Tesla has always made it clear about its ambitious goal to revolutionize the EV market by producing low cost and long range vehicles, this plan is on course. It's unconventional approach to research and development, partnerships with relevant organizations and efficient supply chain management strategy will enable the organization to cut the cost of operation to deliver success, growth, profitability, reliable, affordable and sustainable long range cars for the automotive market.

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