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Introduction

Electric Vehicle (EV) is becoming more common in the automobile industry due to its increasing popularity among the customers. Electric vehicles are run on battery charge rather than fuels. Its structure is different from the conventional engine cars as well. Due to less cost in running and maintenance and less carbon emission, it is becoming popular among the customers. EV is a disruptive technology in the automobile industry that is replacing the use of Internal Combustion Engine (ICE) in many top tier car manufacturer companies (KOTEN and BİLAL, 2018). The nature of the product demands a different value chain than the companies that produce conventional engine cars. Companies manufacturing EV need different suppliers, different facility for storage, different marketing strategy as well. Innovation is the main competitive advantage in the market of EV. Because of EV, opportunities for new and emerging business are increasing. At the same, EV also tends to disrupt some existing products and businesses.

1. Value Chain Analysis based on Electronic Vehicle (EV) businesses.

Primary Activities

Inbound Logistics: Inbound logistics include inward movement of raw goods and storage of those goods. In the case of electronic vehicles, different parts of cars are bought and transported from different suppliers to the business's warehouses (Gamble, Thompson and Peteraf, 2019). These car parts are stored in the warehouses until the warehouse authority gets any order or call from the manufacturing site.

Operations: Operation activities involve testing different parts of the car, manufacturing complete cars and quality control (Chopra, 2020). After getting an order from the corporate, the manufacturing team calls for required materials from warehouses or remaining inventories in the manufacturing site to produce cars. Those materials are tested by the engineers in the manufacturing team before going for production. While manufacturing cars, engineers actively work on controlling the production process to maintain quality.

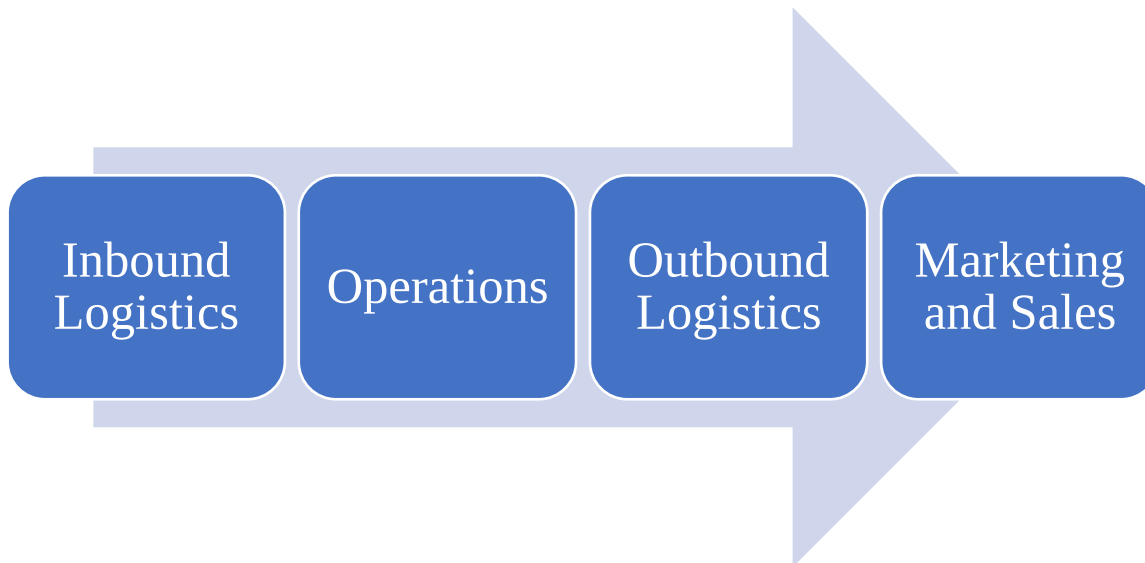


Figure 1: Primary activities of the value chain

Source: (Gamble, Thompson and Peteraf, 2019)

Outbound Logistics: Outbound logistics refers to the activities including transporting complete products from manufacturing site distribution warehouses. After manufacturing, the products which are ready to be marketed moved to the distribution warehouses for distributing.

Marketing and Sales: After having complete cars those are ready to be promoted and distributed. Marketers promote the cars via different media and reveal what features each car have. The management takes the initiative to different regional sales branches, from where the cars are sold through showrooms and online (Villanueva, 2014).

Supporting Activities

HRM: Human resource management ensures recruitment of highly talented employees that are required for a high tech company like electronic vehicle businesses. These employees are trained, motivated and coordinated to conduct important activities in the value chain more effectively (Hook and Jenkins, 2019). Highly talented and innovative employees work as a competitive advantage in industries like the electronic car industry.

Business Infrastructure: Infrastructure of an electronic car manufacturing business is designed in a way that it can help in building a more effective value chain. For example, Volvo has different departments for car manufacturing and energy-related product manufacturing (the United Kingdom | Volvo Cars UK, 2020). This increases the efficiency of the departments and increases the speed of innovative works.

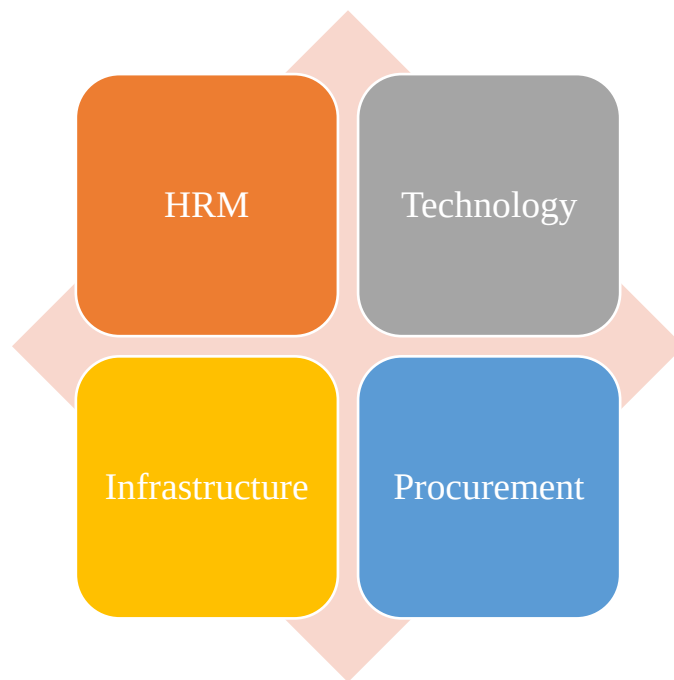


Figure 2: Supporting activities of the value chain

Source: (Chopra, 2020).

Technology: Technology is the main key to differentiation in the electronic vehicle industry. To gain a competitive edge from competitors, car manufacturing companies always need to be up to date with innovation, for which they need advanced technology. For example, automatic driving technology is now really attractive to customers.

Procurement: Procurement refers to the collection of raw materials from the suppliers. Car manufacturer businesses collect parts from different suppliers., For instance, Tesla tyres from a tyre company and collecting car seat materials from another supplier that supplies such material.

Developing a value chain for businesses that manufactures electric vehicles need to be considered separately due to the nature of the business. Storage and inventory management of such business should be in such a way that it can produce the products in expected time which have been ordered by the customers. So, in the case of, inbound logistics, the business needs to choose those suppliers that provide quality materials at a reasonable time. The operation process should be designed to perform testing, production and quality control properly. In the case of the distribution process, cost, convenience, locations should be considered. The support activities, including HRM, infrastructure, technology, procurement should be considered in that the value chain can work effectively.

2. New business opportunities in the electronic car market and the life cycle of those products.

Providing electric vehicle chargers through charge stations: Increase in the demand for electric cars has led to a demand for chargers. So, there is a big business opportunity where the business will provide electronic chargers publicly like petrol pump stations which are for petrol engine cars. These charger stations will be located in different locations based on the availability of electronic vehicles in the region (Larminie and Lowry, 2013). Availability of electric charge stations will increase the demand for electric cars. Moreover, it's a low capital business compared to petrol pump stations as electronic vehicle chargers are very reasonable in price. As it's a new business and doesn't have a strong position in the market, it can be considered that this business stands at the growth stage in the product life cycle. When the use of electronic cars will increase more and the demand for charge stations will reach stability, the business will become mature.

Electric vehicle repair centres: Electronic vehicles are developed on sophisticated technology. So, most of the existing car repair centres may fail to test the faults in and repair electronic cars if they do not have workers with knowledge in high technology. So, needs for separate car repair centres that are specialised in repairing electronic cars are increasing. This is a big opportunity to set up new businesses which will provide testing and repairing service for electric cars. There might be a question that what will happen if the existing car repair centres adapt to repairing electronic cars (Boca, 2015). The answer to this question is, testing and repairing faults in electric cars need high-level knowledge in sophisticated technology. So, adapting with electronic car repairing may harm their existing business as their focus will hugely deviate from current business. So, a separate business for repairing electronic cars have a competitive advantage as they'll have employees who have a high level of knowledge in sophisticated technology. This business also stands at the growth stage in the product life cycle. Reaching to the maturity level of the life cycle depends on increasing the availability of electric cars and keeping up to date with changing technologies.

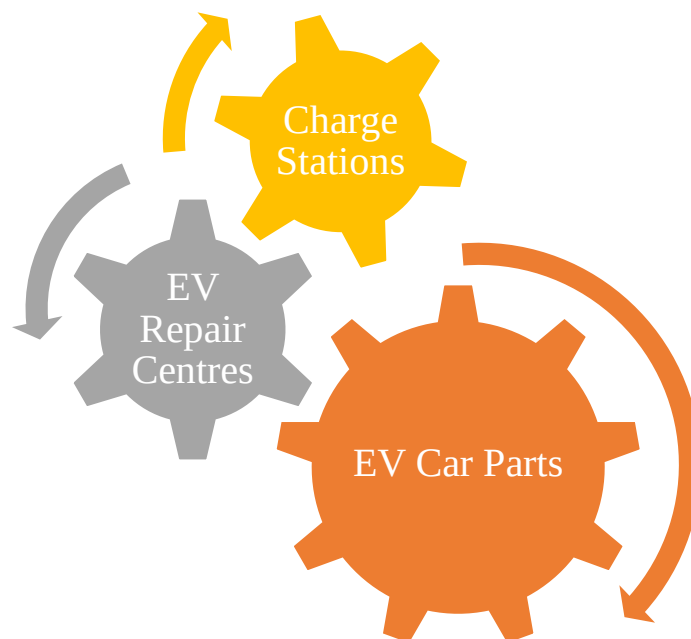


Figure 3: New business opportunities

Source: (Larminie and Lowry, 2013)

Production of electric car parts: This business is an emerging business in the automobile industry. Manufacturing of electric cars needs some parts which are different from traditional petrol engine cars. These spare parts of cars are not manufactured by the car manufacturers themselves. They seek for suppliers who will provide those spare parts to them. This has created a business opportunity to supply spare parts for electric cars to the car manufacturers as the use of electric cars is increasing. As several companies manufacture electric cars, there is a demand for materials which are required to produce electric cars (Muller, 2016). So, a business can be set that will produce spare parts for electric cars only. The differentiation of the business will be, it'll be specialised in producing electric vehicle parts and related materials. This will help the business to focus on a certain kind of product which will help to provide quality products, innovation and eventually help in creating a strong brand image in the market.

3. Identification and assessment of businesses which are not to be continued in the long run.

Disruptive technologies have caused the disruption of many popular products in past. Those disruptive technologies are more threatening in the car industry for existing businesses (Barbaroux, 2019). Because of current technological advancement, some businesses may need to discontinue shortly.

Local Car Repair Shop: At this moment, car repair shops are still profitable. But recent technological advancement in the car industry has led to some threats to this type of businesses. Car manufacturers now don't want to lose any single business opportunity. They are now focusing on car repairs as well. Computerised cars are being launched and these cars can be connected with a computer for a check-up. Some problems in cars now are related to their manufacturers. So, when the owner of a car faces any problem, he can connect his car with a computer and communicate with the manufacturers through the internet to solve the problems (Prasetya and Sianturi, 2019). As most of the top car manufacturing companies are adapting with this technology, it may lead to disruption of car repair service businesses and the control of car repair business will go to manufacturers only.

Businesses Manufacturing Internal Combustion Engine: Internal Combustion Engine (ICE) is a disruptive product now. Battery electric vehicles are more cost-effective than the cars that have

ICE. Electric vehicles need an electric charge that is less costly than the fuel of ICE. Moreover, electric cars are less costly to maintain as well compared to ICE as ICE has starter motors, fuel injector, radiators which are not required in electric vehicles. Besides, electric vehicles cause less pollution than cars with ICE. Because of these, electric vehicles are getting more popular among customers (Seifriedsberger and Rumplmayr, 2016). As a result, the demand for electric cars is increasing day by day. So, investing in the manufacturing of conventional internal combustion engines may not be profitable in the long run. So, this type of business may be discontinued in recent future.

Businesses Manufacturing Older Form of ICE Fuels: While, electronic vehicles are disrupting internal combustion engines, modification of ICE is also being considered. Natural gasoline and diesel fuels are polluting the environment with carbon emission which is a big concern as people are being conscious about environment pollution day by day. So, even if ICEs remain in the market, customers may demand alternative fuels for the engines which have less carbon emission than currently used fuels (Abouel-Seoud, 2016). Synthetic fuels combined with a different kind of gas and oil can reduce pollutant emission from internal combustion engines. So, the demand for synthetic fuels is increasing in the automobile fuel market. So, the use of fuels that cause more carbon emission will reduce. So, investing in the older form of fuels that are used for ICE may not be profitable in the long run.

Conclusion

Electronic Vehicle is a new revolution in the automobile industry. As it is becoming popular among the customers, more and more companies are adapting to this technology and working on producing it. Design and production of electric vehicles need sophisticated technology which is different from traditional engine cars. So, while developing the value chain the management needs to consider this. There should be qualified engineers who have expertise in required technology in the production to make an effective quality control process. The infrastructure of the business should be convenient to work on the development of EV. The HR should recruit and train required employees for design, development and marketing electronic vehicles. Increase in the use of electronic vehicles has led to some business opportunities including electric charge stations, electric car servicing shops etc. EV technology is causing disruption of some businesses and products including traditional car repairing business, ICE, older form of fuels etc.

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